## LIMITED INDOOR MOISTURE INTRUSION AND MOLD INVESTIGATION

May 24, 2022 Prepared For:

SANTA MONICA-MALIBU UNIFIED SCHOOL DISTRICT John Muir – SMASH Elementary School 2828 West 4<sup>TH</sup> Street Santa Monica, CA 90405



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SMUSD-22-10989

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## **1.0 EXECUTIVE SUMMARY**

On May 14 and 15, 2022, Alta Environmental, L.P. an NV5 Company (NV5) conducted a limited indoor moisture intrusion and mold investigation in twenty-one rooms at John Muir SMASH Elementary School (site) for Santa Monica-Malibu Unified School District (client) located at 2828 West 4th Street (St.) in Santa Monica, California. NV5 understands that recurring leaks have been reported at multiple locations and repairs and remediation activities are planned for the near future. The purpose of the investigation was to assess whether the water-damaged building materials have potentially affected the indoor air quality of the impacted areas, and to address occupant concerns. Since the visits occurred over the weekend, no occupants were present at the time of the inspections.

On May 14 and 15, 2022, NV5 Industrial Hygiene Consultants Oscar Garcia and Victor Sanchez performed the following:

- Conducted a limited visual inspection of twenty-one rooms that were randomly selected by NV5 based on the history of water intrusion. The visual inspection assessed for visible signs of water damage and elevated moisture content (e.g., SMG, discoloration, staining, bubbling peeling/cracking, puddled water, efflorescence, etc.), recorded findings in field notes and collected photo documentation,
- Collected a surface tape lift sample of suspect visible mold growth (SMG) from the surface of the wall behind the dry erase board in Room 415, and
- Conducted sampling in these twenty-one rooms for airborne mold spore analysis. A total of twelve outdoor reference samples were also collected at various locations around the building on both days, for comparison purposes. (Note: Due to fluctuations in airborne mold spores that are dependent on dynamic environmental conditions, indoor air sampling data is generally compared to outdoor air sampling data from the same collection day.)

The samples were subsequently submitted to Aerobiology Laboratory in Huntington Beach, California which is accredited by the American Industrial Hygiene Association (AIHA) under its Environmental Microbiology Laboratory Accreditation Program (EMLAP).

Results from the tape lift sample collected from the surface of the wall behind the dry erase board of Room 415 indicated numerous Penicillium/Aspergillus group, numerous Stachybotrys, and moderate hyphal elements. Penicillium/Aspergillus group has been found to be the most common fungal species in water-damaged building materials. Stachybotrys requires constant moisture for growth and is indicative of a long-term water leak, hyphae are the vegetative mode of fungi and hyphal elements are fragments of individual hyphae. Hyphae detected in high concentrations may be indicative of colonization.

Results from the airborne mold spore samples were similar in types and numbers as compared to the outdoor air samples in nineteen of the twenty-one indoor samples, and as such, are considered acceptable. However, two of the air samples that were taken in Rooms 415 and 210B indicated spore levels that were about one and a half to two times higher than the outdoor comparison samples (Penicillium/Aspergillus in Room 415 and Drechslera/Bipolaris and Smuts, Periconia, Myxomycetes groups in Room 210B). The spores detected in Room 210B (i.e., Drechslera/Bipolaris and Smuts, Periconia, Myxomycetes groups) are typical to those found in plants and trees and likely originated from the outdoors, or from plants that may have been inside the space.



Air sample results are a picture of conditions at that point in time and can vary depending on activity levels, weather conditions, dustiness, outside air exchange rates, and other factors. If mold spores found inside a building are significantly different than those detected outside the building, or there is a significant concentration of airborne mold spores indoors that are not detected in the outside air, a further investigation into an indoor mold growth source should be considered.

Results from the visual inspections revealed that several areas exhibited signs of apparent water damage in the form of elevated moisture content, discoloration, staining, bubbling, and peeling/cracking. These rooms included:

- Room 200
- Room 205
- Room 400
- Room 403
- Room 410
- Room 415 (w/visible mold growth)
- Room 455
- Room 500
- Room 515
- Room 605
- Room 615

It's important to note that once moisture is introduced to certain building materials, it generally takes about 24-48 hours for mold to begin growing; therefore, based on these results, the history of moisture intrusion and visual observations, additional "hidden" mold growth is suspected within the impacted wall and ceiling cavities.

NV5 recommends that invasive/destructive testing (DT) is performed under controlled conditions in all impacted areas of visible and suspect moisture intrusion to determine the scope of water damage and/or hidden mold growth. Controls should include, at the least, containment provisions that prevent the dispersal of mold spores and contamination from impacting surrounding unaffected areas, along with the use of appropriate personal protective equipment (PPE). Investigations should also be conducted to identify all sources of moisture intrusion (to the extent possible) and repairs made as necessary to prevent future water damage from recurring. Mold impacted areas over ten square feet should be remediated by a qualified mold remediation contractor under controlled conditions, and in accordance with guidelines set by the Environmental Protection Agency's (EPA) "Mold Remediation in Schools and Commercial Buildings Guide".

The discussion above summarizes the information below which further describes our methodologies during the limited investigations, along with our conclusions and recommendations.

## 2.0 SURFACE TAPELIFT & AIR MONITORING METHODOLOGY

### 2.1 SURFACE TAPE-LIFT SAMPLING

A surface tape lift sample was collected from an area exhibiting SMG and analyzed for mold spore identification. A total of one tape lift sample was collected from the surface of the wall behind the dry erase board of Room 415 utilizing adhesive tape and a microscope slide.



The tape lift sample was subsequently submitted to Aerobiology Laboratory in Huntington Beach, California which is accredited by the American Industrial Hygiene Association (AIHA) under its Environmental Microbiology Laboratory Accreditation Program (EMLAP). The sample was analyzed utilizing direct light microscopic techniques by a trained microscopist and results were reported in qualitative terms describing the identified mold spore types and their relative amounts. A summary of the tape lift results is presented in Table 1. The terms used in the report are as follows:

- *Numerous:* Several spores seen in every field (on their scope at 400X magnification, they have 1681 fields of view on a 1cm x 1cm area)
- *Moderate:* At least 1 spore seen in 5 fields. This equates to 1681 fields divided by 5 so about 336 spores per same unit as above
- Few: Over 5 spores seen per sample area, but less than 1 spore seen in 5 fields. (5-336 spores per same unit as above)
- Occasional: 1-5 spores seen per sample area.

### 2.2 TOTAL AIRBORNE MOLD SPORE SAMPLING

Air sampling for total airborne mold spores was performed at twenty-one indoor locations. Representative locations were selected based on the history of reported water intrusion and a random sampling of locations chosen by NV5. Outdoor reference samples were also collected at various locations around the building on both days, for comparison purposes.

Air filtering machines were observed in several of the rooms; however, many were not running at the time of the air sampling. As noted by NV5, air filtering machines were running in the following locations:

- Room 200
- Room 205
- Room 400
- Room 415
- Room 555
- Room 665
- Room 660

The sampling methods used are described below. Locations and descriptions where the samples were taken are shown in Table 2.

Total airborne mold spores were collected using a Gast hi-volume sampling pump operating at 15 liters of air per minute (L/min). A 10-minute air sample was collected at each location with a resulting sample volume of 150 liters. Samples were collected using Air-O-Cell cassettes that contain an interior glass slide coated with a sticky medium so that impacted particles (including spores) will adhere to the surface. The analysis identifies molds to the genus level. Some mold spores such as *Aspergillus* or *Penicillium* cannot be distinguished using this analytical method, so they are presented as a group. Sample analysis was conducted by Aerobiology located in Huntington Beach, California. This laboratory was accredited by the American Industrial Hygiene Association (AIHA) under its Environmental Microbiology Laboratory Accreditation Program (EMLAP).

NV5 collected samples for airborne mold spores indoors and outdoors during the two separate visits, on May 14 and 15, 2022. Due to fluctuations in airborne mold spores that are dependent on dynamic



environmental conditions, indoor air sampling data is generally compared to outdoor air sampling data from the same collection day.

From the two visits, a total of thirty-three air samples were collected and analyzed by the laboratory. Twenty-one of the thirty-three air samples were collected at representative indoor locations and twelve were collected from the outdoors around the building. The instrument was calibrated with a rotameter on-site and set to 15 L/min immediately prior to beginning the sampling.

### **3.0 VISUAL ASSESSMENT**

During the site visits where indoor air samples were collected, NV5 inspected materials in accessible locations of moisture-impacted areas for visible signs of damage and elevated moisture content (e.g., SMG, discoloration, staining, bubbling, peeling/cracking, puddled water, efflorescence, etc.), recorded findings in field notes and collected photo documentation. A summary of visual observations is presented in Table 3 below.

### 4.0 MOISTURE METER MEASUREMENTS

The visual assessment was supplemented by use of a pin-type moisture meter (Delmhorst BD-10) to check potentially impacted surfaces for relative moisture content. Materials were considered wet or impacted if their moisture content (MC) was greater than that of like materials from non-impacted areas of the building. Elevated readings may represent ambient humidity, minor moisture intrusion, or the status of a material previously wetted that has since partially dried out.

The Delmhorst uses two pin electrodes to detect differences in the capacitance of the signal to determine water content when the pins are inserted into the material so that they penetrate the surface of building materials. The Delmhorst is designed to measure moisture levels in wood and other non-wood building materials. It has a 6-40% moisture range for wood and a reference scale that reads 0-100 on a relative basis for all other non-wood materials. For wood, moisture readings over 17% are generally considered elevated and for other non-wood materials, readings are compared to non-impacted areas of the space.

## 5.0 **RESULTS**

The results from this investigation are presented in the tables below. A Photo Log is presented in Appendix A, Laboratory reports of sampling results are presented in Appendix B, and Field Notes are included in Appendix C.

Sample	Location	Results	Debris Rating
T01	Room 415, So Ctr. Behind Dry Erase Board	Occasional Alternaria Occasional Cladosporium Numerous Penicillium/Aspergillus group Numerous Stachybotrys Moderate hyphal elements	1

Table 1 – Summary of Surface Tape Lift Sample Results for Mold Spores

Debris Rating Table

1 Minimal (<5%) particulate present
-------------------------------------

# N | V | 5

2	5% to 25% of the trace occluded with particulate
3	26% to 75% of the trace occluded with particulate
4	75% to 90% of the trace occluded with particulate
ы	Greater than 90% of the trace occluded with particulate

## N | V | 5

Sample	Sample	Results	Conc.	Conc.	Highest Outdoor Air Comparison	Highest Outdoor Air Comparison
#	Location		(s/m <sup>3</sup> )	(s/m <sup>3</sup> )	(s/m <sup>3</sup> )	(s/m <sup>3</sup> )
			5-14-22	5-15-22	5-14-22	5-15-22
		Alternaria	7	N/A	20	N/A
2280		Ascospores	13	N/A	93	N/A
		Basidiospores	33	N/A	47	N/A
		Chaetomium	-	N/A	7	N/A
		Cladosporium	180	N/A	273	N/A
		Drechslera/Bipolaris	-	N/A	27	N/A
	Room 415	Hyphal elements	40	N/A	33	N/A
1253	No. Otr. Interior	Penicillium/Aspergillus	113	N/A	53	N/A
	No. cr. menor	Pithomyces	7	N/A	7	N/A
		Rusts	-	N/A	13	N/A
		Smuts, Periconia, Myxomycetes	33	N/A	133	N/A
		Stachybotrys	-	N/A	-	N/A
		Stemphylium	-	N/A	-	N/A
		Torula	-	N/A	-	N/A
		Alternaria	-	N/A	20	N/A
		Ascospores	33	N/A	93	N/A
		Basidiospores	27	N/A	47	N/A
		Chaetomium	7	N/A	7	N/A
	Room 410 N/E Interior	Cladosporium	87	N/A	273	N/A
		Drechslera/Bipolaris	7	N/A	27	N/A
3389-		Hyphal elements	67	N/A	33	N/A
1248		Penicillium/Aspergillus	-	N/A	53	N/A
		Pithomyces	-	N/A	7	N/A
		Rusts	-	N/A	13	N/A
		Smuts, Periconia, Myxomycetes	13	N/A	133	N/A
		Stachybotrys	-	N/A	-	N/A
		Stemphylium	-	N/A	-	N/A
		Torula	-	N/A	-	N/A
		Alternaria	27	N/A	20	N/A
		Ascospores	20	N/A	93	N/A
		Basidiospores	27	N/A	47	N/A
3389-	Room 400	Chaetomium	-	N/A	7	N/A
1253	S/W Interior	Cladosporium	33	N/A	273	N/A
		Drechslera/Bipolaris	7	N/A	27	N/A
		Hyphal elements	40	N/A	33	N/A
		Penicillium/Aspergillus	13	N/A	53	N/A

Sample	Sample	Results	Conc.	Conc.	Highest Outdoor Air Comparison	Highest Outdoor Air Comparison
#	Location		(s/m <sup>3</sup> )	(s/m <sup>3</sup> )	(s/m <sup>3</sup> )	(s/m <sup>3</sup> )
			5-14-22	5-15-22	5- <b>14-22</b>	5-15-22
		Pithomyces	-	N/A	7	N/A
		Rusts	-	N/A	13	N/A
		Smuts, Periconia, Myxomycetes	13	N/A	133	N/A
		Stachybotrys	-	N/A	-	N/A
		Stemphylium	-	N/A	-	N/A
		Torula	-	N/A	-	N/A
		Alternaria	7	N/A	20	N/A
		Ascospores	-	N/A	93	N/A
		Basidiospores	-	N/A	47	N/A
		Chaetomium	-	N/A	7	N/A
		Cladosporium	-	N/A	273	N/A
		Drechslera/Bipolaris	-	N/A	27	N/A
3380-	Room 403	Hyphal elements	-	N/A	33	N/A
1247	Ctr. Interior	Penicillium/Aspergillus	-	N/A	53	N/A
		Pithomyces	-	N/A	7	N/A
		Rusts	-	N/A	13	N/A
		Smuts, Periconia, Myxomycetes	-	N/A	133	N/A
		Stachybotrys	-	N/A	-	N/A
		Stemphylium	-	N/A	-	N/A
		Torula	-	N/A	-	N/A
		Alternaria	-	N/A	20	N/A
		Ascospores	13	N/A	93	N/A
		Basidiospores	13	N/A	47	N/A
		Chaetomium	-	N/A	7	N/A
		Cladosporium	47	N/A	273	N/A
		Drechslera/Bipolaris	-	N/A	27	N/A
3380-	Room 100	Hyphal elements	-	N/A	33	N/A
1598	Ctr (I)	Penicillium/Aspergillus	-	N/A	53	N/A
	<i>C</i> ( <i>I</i> )	Pithomyces	-	N/A	7	N/A
		Rusts	-	N/A	13	N/A
		Smuts, Periconia, Myxomycetes	-	N/A	133	N/A
		Stachybotrys	-	N/A	-	N/A
		Stemphylium	-	N/A	-	N/A
		Torula	-	N/A	-	N/A
	Room 480	Alternaria	40	N/A	20	N/A
3389-		Ascospores	7	N/A	93	N/A
0101	N/E.Side Interior	Basidiospores	-	N/A	47	N/A

# N | V | 5

Sample	Sample	Results	Conc.	Conc.	Highest Outdoor Air Comparison	Highest Outdoor Air Comparison
#	Location		(s/m <sup>3</sup> )	(s/m <sup>3</sup> )	(s/m <sup>3</sup> )	(s/m <sup>3</sup> )
			5-14-22	5-15-22	5- <b>14-22</b>	5-15-22
		Chaetomium	7	N/A	7	N/A
		Cladosporium	20	N/A	273	N/A
		Drechslera/Bipolaris	27	N/A	27	N/A
		Hyphal elements	87	N/A	33	N/A
		Penicillium/Aspergillus	7	N/A	53	N/A
		Pithomyces	-	N/A	7	N/A
		Rusts	-	N/A	13	N/A
		Smuts, Periconia, Myxomycetes	27	N/A	133	N/A
		Stachybotrys	-	N/A	-	N/A
		Stemphylium	-	N/A	-	N/A
		Torula	-	N/A	-	N/A
		Alternaria	-	N/A	20	N/A
		Ascospores	20	N/A	93	N/A
		Basidiospores	13	N/A	47	N/A
		Chaetomium	-	N/A	7	N/A
		Cladosporium	73	N/A	273	N/A
		Drechslera/Bipolaris	-	N/A	27	N/A
3389-	Room 455	Hyphal elements	40	N/A	33	N/A
0149	No. Ctr. Interior	Penicillium/Aspergillus	33	N/A	53	N/A
		Pithomyces	-	N/A	7	N/A
		Rusts	-	N/A	13	N/A
		Smuts, Periconia, Myxomycetes	13	N/A	133	N/A
		Stachybotrys	-	N/A	-	N/A
		Stemphylium	-	N/A	-	N/A
		Torula	-	N/A	-	N/A
		Alternaria	-	N/A	20	N/A
		Ascospores	-	N/A	93	N/A
		Basidiospores	-	N/A	47	N/A
		Chaetomium	-	N/A	7	N/A
		Cladosporium	13	N/A	273	N/A
3389-	Room 565	Drechslera/Bipolaris	-	N/A	27	N/A
3389- 1255	E/ Ctr. By Sink	Hyphal elements	27	N/A	33	N/A
	Interior	Penicillium/Aspergillus	7	N/A	53	N/A
		Pithomyces	7	N/A	7	N/A
		Rusts	-	N/A	13	N/A
		Smuts, Periconia, Myxomycetes	-	N/A	133	N/A
		Stachybotrys	-	N/A	-	N/A

## N | V | 5

Sample	Sample	Results	Conc.	Conc.	Highest Outdoor Air Comparison	Highest Outdoor Air Comparison
#	Location		(s/m <sup>3</sup> )	(s/m <sup>3</sup> )	(s/m <sup>3</sup> )	(s/m <sup>3</sup> )
			5-14-22	5-15-22	5-14-22	5-15-22
		Stemphylium	-	N/A		N/A
		Torula	-	N/A	-	N/A
		Alternaria	7	N/A	20	N/A
3436-		Ascospores	7	N/A	93	N/A
		Basidiospores	-	N/A	47	N/A
		Chaetomium	-	N/A	7	N/A
		Cladosporium	13	N/A	273	N/A
	De em FFF	Drechslera/Bipolaris	-	N/A	27	N/A
	R00m 555	Hyphal elements	13	N/A	33	N/A
2483	S/E Side	Penicillium/Aspergillus	-	N/A	53	N/A
	Interior	Pithomyces	-	N/A	7	N/A
		Rusts	-	N/A	13	N/A
		Smuts, Periconia, Myxomycetes	-	N/A	133	N/A
		Stachybotrys	-	N/A	-	N/A
		Stemphylium	-	N/A	-	N/A
		Torula	7	N/A	-	N/A
		Alternaria	-	N/A	20	N/A
		Ascospores	-	N/A	93	N/A
		Basidiospores	-	N/A	47	N/A
		Chaetomium	-	N/A	7	N/A
		Cladosporium	27	N/A	273	N/A
		Drechslera/Bipolaris	-	N/A	27	N/A
3436-	R o om 500	Hyphal elements	-	N/A	33	N/A
2492	So. Ctr. (I)	Penicillium/Aspergillus	-	N/A	53	N/A
		Pithomyces	-	N/A	7	N/A
		Rusts	-	N/A	13	N/A
		Smuts, Periconia, Myxomycetes	7	N/A	133	N/A
		Stachybotrys	-	N/A	-	N/A
		Stemphylium	-	N/A	-	N/A
		Torula	-	N/A	-	N/A
		Alternaria	-	N/A	20	N/A
		Ascospores	27	N/A	93	N/A
	Room 515	Basidiospores	-	N/A	47	N/A
3436- 2464		Chaetomium	-	N/A	7	N/A
2707	No. Ctr. (I)	Cladosporium	-	N/A	273	N/A
		Drechslera/Bipolaris	-	N/A	27	N/A
		Hyphal elements	7	N/A	33	N/A

Sample	Sample	Results	Conc.	Conc.	Highest Outdoor Air Comparison	Highest Outdoor Air Comparison
#	Location		(s/m <sup>3</sup> )	(s/m <sup>3</sup> )	(s/m <sup>3</sup> )	(s/m <sup>3</sup> )
			5-14-22	5-15-22	5- <b>14-22</b>	5-15-22
		Penicillium/Aspergillus	-	N/A	53	N/A
		Pithomyces	-	N/A	7	N/A
		Rusts	-	N/A	13	N/A
		Smuts, Periconia, Myxomycetes	7	N/A	133	N/A
		Stachybotrys	-	N/A	-	N/A
		Stemphylium	-	N/A	-	N/A
		Torula	-	N/A	-	N/A
		Alternaria	N/A	-	N/A	13
		Ascospores	N/A	20	N/A	60
		Basidiospores	N/A	-	N/A	7
		Chaetomium	N/A	-	N/A	-
		Cladosporium	N/A	40	N/A	180
		Drechslera/Bipolaris	N/A	-	N/A	7
3436-	Room 605	Hyphal elements	N/A	-	N/A	33
2471	SW (I)	Penicillium/Aspergillus	N/A	13	N/A	27
		Pithomyces	N/A	-	N/A	-
		Rusts	N/A	-	N/A	-
		Smuts, Periconia,	N/A	-	N/A	27
		Stachybotrys	N/A	-	N/A	7
		Stemphylium	N/A	-	N/A	-
		Torula	N/A	-	N/A	-
		Alternaria	N/A	-	N/A	13
		Ascospores	N/A	-	N/A	60
		Basidiospores	N/A	-	N/A	7
		Chaetomium	N/A	-	N/A	-
		Cladosporium	N/A	13	N/A	180
		Drechslera/Bipolaris	N/A	-	N/A	7
3436-	Room 600	Hyphal elements	N/A	7	N/A	33
2476	AUA/ 20	Penicillium/Aspergillus	N/A	13	N/A	27
	N W (I)	Pithomyces	N/A	-	N/A	-
		Rusts	N/A	-	N/A	-
		Smuts, Periconia, Myxomycetes	N/A	-	N/A	27
		Stachybotrys	N/A	-	N/A	7
		Stemphylium	N/A	-	N/A	-
		Torula	N/A	-	N/A	-
3436-	Room 665	Alternaria	N/A	13	N/A	13
2488		Ascospores	N/A	13	N/A	60

Sample	Sample	Results	Conc.	Conc.	Highest Outdoor Air Comparison	Highest Outdoor Air Comparison
#	Location		(s/m <sup>3</sup> )	(s/m <sup>3</sup> )	(s/m <sup>3</sup> )	(s/m <sup>3</sup> )
			5-14-22	5-15-22	5-1 <b>4-22</b>	5-15-22
	Ctr.	Basidiospores	N/A	7	N/A	7
		Chaetomium	N/A	-	N/A	-
		Cladosporium	N/A	80	N/A	180
		Drechslera/Bipolaris	N/A	-	N/A	7
		Hyphal elements	N/A	13	N/A	33
		Penicillium/Aspergillus	N/A	13	N/A	27
		Pithomyces	N/A	-	N/A	-
		Rusts	N/A	-	N/A	-
		Smuts, Periconia, Myxomycetes	N/A	-	N/A	27
		Stachybotrys	N/A	-	N/A	7
		Stemphylium	N/A	-	N/A	-
		Torula	N/A	-	N/A	-
		Alternaria	N/A	-	N/A	13
3436- 2480		Ascospores	N/A	13	N/A	60
		Basidiospores	N/A	33	N/A	7
		Chaetomium	N/A	-	N/A	-
	Room 660 S∕W	Cladosporium	N/A	-	N/A	180
		Drechslera/Bipolaris	N/A	-	N/A	7
		Hyphal elements	N/A	7	N/A	33
		Penicillium/Aspergillus	N/A	-	N/A	27
		Pithomyces	N/A	-	N/A	-
		Rusts	N/A	-	N/A	-
		Smuts, Periconia, Myxomycetes	N/A	73	N/A	27
		Stachybotrys	N/A	-	N/A	7
		Stemphylium	N/A	-	N/A	-
		Torula	N/A	-	N/A	-
		Alternaria	N/A	-	N/A	13
		Ascospores	N/A	-	N/A	60
		Basidiospores	N/A	-	N/A	7
		Chaetomium	N/A	-	N/A	-
	Room 665	Cladosporium	N/A	33	N/A	180
3436- 2489		Drechslera/Bipolaris	N/A	-	N/A	7
2400	N/E	Hyphal elements	N/A	7	N/A	33
		Penicillium/Aspergillus	N/A	-	N/A	27
		Pithomyces	N/A	-	N/A	-
		Rusts	N/A	-	N/A	-
		Smuts, Periconia, Myxomycetes	N/A	-	N/A	27

Sample	Sample	Results	Conc.	Conc.	Highest Outdoor Air Comparison	Highest Outdoor Air Comparison
#	Location		(s/m <sup>3</sup> )	(s/m <sup>3</sup> )	(s/m <sup>3</sup> )	(s/m <sup>3</sup> )
			5-14-22	5-15-22	5- <b>14-22</b>	5-15-22
		Stachybotrys	N/A	-	N/A	7
		Stemphylium	N/A	-	N/A	-
		Torula	N/A	-	N/A	-
		Alternaria	N/A	20	N/A	13
		Ascospores	N/A	7	N/A	60
		Basidiospores	N/A	-	N/A	7
		Chaetomium	N/A	-	N/A	-
		Cladosporium	N/A	20	N/A	180
		Drechslera/Bipolaris	N/A	-	N/A	7
3436-	Room 200	Hyphal elements	N/A	-	N/A	33
2468	F (0+	Penicillium/Aspergillus	N/A	-	N/A	27
	E./ Cu.	Pithomyces	N/A	-	N/A	-
		Rusts	N/A	-	N/A	-
		Smuts, Periconia, Myxomycetes	N/A	-	N/A	27
		Stachybotrys	N/A	-	N/A	7
		Stemphylium	N/A	-	N/A	-
		Torula	N/A	-	N/A	-
		Alternaria	N/A	7	N/A	13
		Ascospores	N/A	7	N/A	60
		Basidiospores	N/A	-	N/A	7
		Chaetomium	N/A	-	N/A	-
		Cladosporium	N/A	40	N/A	180
		Drechslera/Bipolaris	N/A	7	N/A	7
3436-	Room 200	Hyphal elements	N/A	7	N/A	33
2466	Wast Side	Penicillium/Aspergillus	N/A	-	N/A	27
	west side	Pithomyces	N/A	-	N/A	-
		Rusts	N/A	-	N/A	-
		Smuts, Periconia, Myxomycetes	N/A	-	N/A	27
		Stachybotrys	N/A	-	N/A	7
		Stemphylium	N/A	-	N/A	-
		Torula	N/A	7	N/A	-
		Alternaria	N/A	13	N/A	13
		Ascospores	N/A	27	N/A	60
3436-	Room 210B Ctr.	Basidiospores	N/A	7	N/A	7
2491	No. Ctr. Interior	Chaetomium	N/A	-	N/A	-
		Cladosporium	N/A	33	N/A	180
		Drechslera/Bipolaris	N/A	20	N/A	7

Sample	Sample	Results	Conc.	Conc.	Highest Outdoor Air Comparison	Highest Outdoor Air Comparison
#	Location		(s/m <sup>3</sup> )	(s/m <sup>3</sup> )	(s/m <sup>3</sup> )	(s/m <sup>3</sup> )
			5-14-22	5-15-22	5-14-22	5-15-22
		Hyphal elements	N/A	40	N/A	33
		Penicillium/Aspergillus	N/A	7	N/A	27
		Pithomyces	N/A	-	N/A	-
		Rusts	N/A	-	N/A	-
		Smuts, Periconia, Myxomycetes	N/A	40	N/A	27
		Stachybotrys	N/A	-	N/A	7
		Stemphylium	N/A	-	N/A	-
		Torula	N/A	-	N/A	-
		Alternaria	N/A	-	N/A	13
		Ascospores	N/A	-	N/A	60
		Basidiospores	N/A	7	N/A	7
		Chaetomium	N/A	-	N/A	-
		Cladosporium	N/A	20	N/A	180
	Room 205 Ctr.	Drechslera/Bipolaris	N/A	-	N/A	7
3436-		Hyphal elements	N/A	-	N/A	33
2490		Penicillium/Aspergillus	N/A	-	N/A	27
		Pithomyces	N/A	-	N/A	-
		Rusts	N/A	-	N/A	-
		Smuts, Periconia, Myxomycetes	N/A	-	N/A	27
		Stachybotrys	N/A	-	N/A	7
		Stemphylium	N/A	-	N/A	-
		Torula	N/A	-	N/A	-
		Alternaria	N/A	-	N/A	13
		Ascospores	N/A	20	N/A	60
		Basidiospores	N/A	20	N/A	7
		Chaetomium	N/A	-	N/A	-
		Cladosporium	N/A	40	N/A	180
		Drechslera/Bipolaris	N/A	-	N/A	7
3436-	Room 615	Hyphal elements	N/A	27	N/A	33
2481	W Ctr (I)	Penicillium/Aspergillus	N/A	20	N/A	27
	W Cu. (/)	Pithomyces	N/A	-	N/A	-
		Rusts	N/A	-	N/A	-
		Smuts, Periconia, Myxomycetes	N/A	13	N/A	27
		Stachybotrys	N/A	-	N/A	7
		Stemphylium	N/A	-	N/A	-
		Torula	N/A	-	N/A	-

Location	Moisture Measurements (MC)	Visual Observations
Room 200	Background: 20-25 MC Wood/Drywall	<ul> <li>No SMG observed</li> <li>Small water stains at southeast side on wood framing in ceiling cavity and metal support beams</li> <li>Air purifiers ON</li> </ul>
Room 210B	Background: 20 MC Drywall	<ul><li>No SMG or water stains observed</li><li>No air purifier</li></ul>
Room 205	Background: 20-30 MC Drywall	<ul> <li>No SMG observed</li> <li>Small water stains on replaced 2x4 ceiling tile at northwest side</li> <li>Air purifier ON</li> </ul>
Room 665	Background: 15-23 MC Drywall	<ul><li>No SMG or water stains observed</li><li>No air purifier</li></ul>
Room 660	Background: 25-30 MC Drywall	<ul> <li>No SMG or water stains observed</li> <li>Air purifier ON</li> </ul>
Room 665	Background: 25-30 MC Drywall	<ul><li>No SMG or water stains observed</li><li>Air purifier ON</li></ul>
Room 600	Background: 30-40 MC Drywall	<ul><li>No SMG or water stains observed</li><li>Air purifier OFF</li></ul>
Room 605	Background: 20-30 MC Drywall	<ul> <li>No SMG observed</li> <li>Water staining on west center section of wood framing in ceiling cavity</li> <li>Air purifier OFF</li> </ul>
Room 615	Background: 30 MC Drywall	<ul> <li>No SMG observed</li> <li>Water stains on northwest corner by entrance and at east center area on wood framing supports in ceiling cavity</li> <li>Air purifier OFF</li> </ul>
Room 555	Background: 20-50 MC Drywall	<ul><li>No SMG or water stains observed</li><li>Air purifier ON</li></ul>
Room 415	Background: 20-30 MC Drywall	<ul> <li>Mold growth confirmed behind dry erase board</li> <li>Water stains and elevated moisture at south wall (50 MC at 2 feet up from floor, 60 MC at 4 feet up from floor, 90 MC at 8 feet up from floor, 100 MC plus at 10 feet up from floor)</li> <li>Approximately 12'x5' section impacted at center of south wall</li> <li>Plywood on southern section deteriorated and cracked (~4'x6'section)</li> <li>Water stains on wood framing in ceiling cavity at north wall</li> <li>Air purifier ON</li> </ul>
Room 410	Background: 20-30 MC Drywall	<ul> <li>No SMG observed</li> <li>Water stains at south center section of wood framing in ceiling cavity</li> </ul>
Room 515	Background: 20-25 MC	<ul> <li>No SMG observed</li> <li>Elevated moisture at east wall below sink and up 11 feet at east wall (40-90 MC)</li> </ul>

Table 3 – Summary of Visual Observations

		<ul> <li>Water stains on electrical conduits and wood framing within ceiling cavity</li> <li>Air purifier OFF</li> </ul>
Room 500	Background: 20-30 MC	<ul> <li>No SMG observed</li> <li>Elevated moisture on wood framing within ceiling cavity (40 MC wood, 9 MC drywall)</li> <li>Air purifier OFF</li> </ul>
Room 565	Background: 20-30 MC	<ul><li>No SMG or water stains observed</li><li>Air purifier OFF</li></ul>
Room 455	Background: 20-30 MC	<ul> <li>No SMG observed</li> <li>Bulging paint and elevated moisture (60 MC drywall) at west wall by sink area</li> <li>Status of air purifier not noted</li> </ul>
Room 480	Background: 20-30 MC	<ul><li>No SMG or water stains observed</li><li>Air purifier OFF</li></ul>
Room 100	Background: 20-40 MC	<ul><li>No SMG or water stains observed</li><li>Status of air purifier not noted</li></ul>
Room 400	Background: 20-25 MC	<ul> <li>No SMG observed</li> <li>Water stains on southern section of wood framing in ceiling cavity ~3' from south wall</li> <li>Drywall warped and paint bulging at south wall (~80sqft. impacted); elevated moisture (30 MC drywall)</li> <li>Water stains and elevated moisture ~1' up from floor (60 MC) at east wall near entrance to Room 403</li> <li>Air purifier is ON</li> </ul>
Room 403	Background: 20 MC	<ul> <li>No SMG observed</li> <li>Bulging paint on drywall at west wall adjacent to window (~4sqft. impacted); elevated moisture (30 MC) ~4' up from floor</li> <li>Status of air purifier not noted</li> </ul>

## 6.0 CONCLUSIONS & DISCUSSION

Based on visual observations, history of moisture intrusion, and results obtained by the air and surface sampling, NV5 concludes the following:

### 6.1 SURFACE TAPE LIFT SAMPLES

A surface tape lift sample was collected from an area exhibiting SMG and analyzed for mold spore identification. A total of one tape lift sample was collected from the surface of the wall behind the dry erase board of Room 415 utilizing adhesive tape and a microscope slide. The location and description where the sample was taken is shown in Table 1 above.

A study from the National Library of Medicine, National Center for Biotechnology Information (NCBI) included an article named "Associations between Fungal Species and Water-Damaged Building Materials" that confirmed certain Penicillium and Aspergillus species are the most common fungal species in water-damaged buildings. (American Society for Microbiology, Applied and Environmental



Microbiology, "Associations between Fungal Species and Water-Damaged Building Materials", 2011 Jun).

The tape lift sample collected from the surface of the wall behind the dry erase board of Room 415 indicated numerous Penicillium/Aspergillus group, numerous Stachybotrys, and moderate hyphal elements. As mentioned above, Penicillium/Aspergillus group has been found to be the most common fungal species in water-damaged building materials. Stachybotrys requires constant moisture for growth and is indicative of a long-term water leak. Hyphae are the vegetative mode of fungi and hyphal elements are fragments of individual hyphae. Hyphae detected in high concentration may be indicative of colonization. Once moisture is introduced to certain building materials, it generally takes about 24-48 hours for mold to begin growing. Based on these results and visual observations, additional "hidden" mold growth is suspected within the wall cavity at this location.

### 6.2 TOTAL AIRBORNE MOLD SPORES

NV5 collected samples for airborne mold spores during two separate visits, on May 14 and 15, 2022. The air sample results for airborne mold spores were similar in types and numbers as compared to the outdoor air samples in nineteen of the twenty-one indoor samples, and as such, are considered acceptable. However, two of the air samples that were taken in Rooms 415 and 210B indicated spore levels that were about one and a half to two times higher than the outdoor comparison samples (Penicillium/Aspergillus in Room 415 and Drechslera/Bipolaris and Smuts, Periconia, Myxomycetes groups in Room 210B). The spores detected in Room 210B (i.e., Drechslera/Bipolaris and Smuts, Periconia, Myxomycetes groups) are typical to those found in plants and trees and likely originated from the outdoors, or from plants that may have been inside the space.

Air sample results are a picture of conditions at that point in time and can vary depending on activity levels, weather conditions, dustiness, outside air exchange rates, and other factors. Since airborne mold spores are natural and ubiquitous in the environment, the total number of mold spores from indoor sample subject areas are compared to the outdoor reference samples, but the type and rank of mold spores detected is also considered. Mold spores detected inside the building should typically reflect those spores found in the outside air but at a concentration that is generally lower than the outside air. If mold spores found inside a building are significantly different than those detected outside the building, or there is a significant concentration of airborne mold spores indoors that are not detected in the outside air, a further investigation into an indoor mold growth source should be considered.

### 6.3 VISUAL INSPECTION

Several areas, as shown in Table 3 above, exhibited signs of apparent water damage. The following areas exhibited elevated moisture content and/or water damage (e.g., SMG, discoloration, staining, bubbling, peeling/cracking, puddled water, efflorescence, etc.):

- Room 200
- Room 205
- Room 400
- Room 403
- Room 410
- Room 415 (w/visible mold growth)
- Room 455

- Room 500
- Room 515
- Room 605
- Room 615

Results from the visual inspections further support the fact that moisture intrusion events have impacted building materials in several areas of the buildings.

## 7.0 RECOMMENDATIONS

Based on this limited moisture intrusion and mold investigation, the reported history of moisture intrusion, and likelihood that moisture remained on building materials for at least 24-48 hours, conditions conducive to mold growth exist and as such, hidden mold growth sources should be identified.

Following the site visits that took place on May 14 and 15, 2022, discussions with District staff revealed that within the upcoming months, plans involve follow-up investigations that include (but are not limited to):

- identifying the sources of moisture intrusion
- making the necessary repairs to control future moisture intrusion issues from recurring
- determining the scope of hidden mold growth, and
- conducting subsequent remediation to ensure the health and safety of occupants.

NV5 recommends that the following provisions take place as part of the ongoing efforts:

- Exposure to mold may elicit adverse health effects in some individuals. Those individuals may wish to consult their primary care doctor regarding specific health effects, and refrain from or limit their entrance into these affected spaces as appropriate.
- The tape lift sample that was collected from the surface of the wall behind the dry erase board in Room 415 confirmed the presence of mold growth. Porous materials such as drywall and insulation that exhibit water damage and/or visible mold growth, or have documented mold growth, should be removed, and discarded.
- Perform invasive/destructive testing (DT) under controlled conditions in all impacted areas of visible and suspect moisture intrusion to determine the scope of water damage and/or hidden mold growth. Controlled conditions should include, at the least, containment provisions that prevent the dispersal of mold spores and contamination into surrounding unaffected areas.
- Conduct investigations to identify sources of moisture intrusion, to the extent possible, and make repairs as necessary to prevent future water damage from recurring.
- Impacted areas over ten square feet should be remediated by a qualified mold remediation contractor under controlled conditions and in accordance with guidelines set by the Environmental Protection Agency's (EPA) *"Mold Remediation in Schools and Commercial Buildings Guide"*. This Guide can be found at the following link:

https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guidechapter-1



- For more details on addressing mold and water intrusion, below is a list of credible resources that can be referenced:
  - U.S. Department of Labor Occupational Safety and Health Administration (November 8, 2013). Safety and Health Information Bulletin: A Brief Guide to Mold in the Workplace. SHIB 03-10-10)
  - American Industrial Hygiene Association. (2008). *Recognition, Evaluation and Control of Indoor Mold.* IMOM08-679.
  - New York City Department of Health. (November 2008). *Guidelines on Assessment and Remediation of Fungi in Indoor Environments.*
  - Institute of Inspection, Cleaning and Restoration Contractors. (2015). *IICRC* 500 Standard and Reference Guide for Professional Water Damage Restoration. Fourth edition.
  - Institute of Inspection, Cleaning and Restoration Contractors. (2015). *IICRC* S520 Standard and Reference Guide for Professional Mold Remediation. Third edition.
  - Centers for Disease Control and Prevention (CDC) link at: <u>https://www.cdc.gov/mold/</u>

### 8.0 LIMITATIONS

The work performed is based on the scope of work authorized by Santa Monica-Malibu Unified School District. NV5's assessment was limited to the data supplied by the client or obtained during the walkthrough. NV5, in good faith, must rely on representations and information furnished by Santa Monica-Malibu Unified School District with respect to operations and existing conditions. The data, findings, and recommendations contained within this report are NV5's best professional judgment based on observations at the time of the assessment. NV5 cannot be responsible for the impact of any changes in safety standards, practices, or regulations after performance of the services. NV5 accepts no responsibility for damages or losses suffered as a result of decisions made or actions taken based on this report.

This Limited Moisture Intrusion and Mold Investigation Report has been prepared at the request of Santa Monica-Malibu Unified School District and this document is intended for internal use only and is considered Company Private Property. Distribution of this is prohibited without consent of Santa Monica-Malibu Unified School District.

Respectfully submitted by:

Reviewed by:

icole 2/12 m

Datesa

Nicole Naggar, LEED GA, SFP NV5 Senior Consultant/Project Manager, EHS

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Reviewed by:

Cecile Felsher, CIH, CSP NV5 Director, EHS & Air

## **APPENDIX A – PHOTO LOG**



## PHOTO LOG

SMMUSD - 22- 10989





Room 615 water stains on northwest

corner by entrance



Room 615 water stains at east center area on wood framing and in ceiling cavity



Room 415 classroom overview



Room 415 water stains on wood support



Room 415 visible mold behind dry erase board on south wall



Room 415 dry rot wood in ceiling cavity at south wall



Room 415 water stains on wood framing in ceiling cavity at north wall



Room 410 classroom overview



Room 410 water stains at south center section of wood framing in ceiling cavity



Room 515 classroom sink underside with exposed wall cavity



Room 515 classroom overview



Room 515 classroom sink



Room 515 view of exposed wall cavity at ceiling level



Room 515 water stains at wood framing at ceiling cavity



Room 515 water stains on metal piping and wood at ceiling cavity



Room 500 classroom overview



Room 500 view of deck drain and exposed drywall



Room 455 classroom overview



Room 455 bulging paint at west wall by sink area



Room 400 classroom overview



Room 400 water stains wood framing in ceiling cavity



Room 400 drywall warped and paint bulging at south wall



Room 400 drywall warped and paint bulging at south wall



Room 400 water stain on drywall east wall adjacent entry to Room 403

Room 403 overview	Room 403 bulging paint on drywall	

## **APPENDIX B – LABORATORY REPORTS**

N V 5 Delivering Solutions Improving Lives



#### **Certificate of Analysis** AIHA-LAP EMLAP# 218951

Alta Environmental, an NV5 Inc. 3777 Long Beach Blvd., Annex Bldg Long Beach CA, 90807 Attn: Nicole Naggar Project: SMSD-22-10989 / SMASH/MUIR Condition of Sample(s) Upon Receipt: Acceptable Date Collected: 5/14/2022 Date Received: 5/16/2022 Date Analyzed: 5/16/2022 Date Reported: 5/16/2022 Project ID: 22017996 Page 1 of 4

	1054 Spore	Trap Analysi	s SOP 3.8: Sa	me Day TAT				
Client Sample #		3389	-1253		3389-1248			
Sample Location		R-415 No. 0	Ctr. Interior		R-410 N/E Interior			
Sample Volume (L)		1	50		150			
Lab Sample #		220179	996-001			220179	96-002	
Spore Identification	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	RawCt	spr/m <sup>3</sup>	%Ttl	I/O
Alternaria	1	7	2	-	-	-	-	-
ascospores	2	13	3	-	5	33	14	-
basidiospores	5	33	8	-	4	27	11	-
Chaetomium	-	-	-	-	1	7	3	-
Cladosporium	27	180	42	-	13	87	36	-
Drechslera/Bipolaris group	-	-	-	-	1	7	3	-
hyphal elements	6	40	9	-	10	67	28	-
Penicillium/Aspergillus group	17	113	27	-	-	-	-	-
Pithomyces	1	7	2	-	-	-	-	-
Smuts,Periconia,Myxomycetes	5	33	8	-	2	13	6	-
		Debris Rating 3				Debris F	Rating 3	
Analytical Sensitivity	An	alytical Sens	itivity: <b>7</b> spr/	m <sup>3</sup>	Analytical Sensitivity: 7 spr/m <sup>3</sup>			'm <sup>3</sup>
Comments								
Total *See Footnotes	64	427	~100%	-	36	240	~100%	-

Client Sample #	3389-0099				3389-1247			
Sample Location		R-400 S/V	V Interior		R-403 Ctr. Interior			
Sample Volume (L)		1	50		150			
Lab Sample #		220179	96-003			220179	96-004	
Spore Identification	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	RawCt	spr/m <sup>3</sup>	%Ttl	I/O
Alternaria	4	27	15	-	1	7	100	-
ascospores	3	20	11	-	-	-	-	-
basidiospores	4	27	15	-	-	-	-	-
Cladosporium	5	33	19	-	-	-	-	-
Drechslera/Bipolaris group	1	7	4	-	-	-	-	-
hyphal elements	6	40	22	-	-	-	-	-
Penicillium/Aspergillus group	2	13	7	-	-	-	-	-
Smuts,Periconia,Myxomycetes	2	13	7	-	-	-	-	-
		Debris Rating 3			Debris Rating 2			
Analytical Sensitivity	An	Analytical Sensitivity: 7 spr/m <sup>3</sup>			Analytical Sensitivity: 7 spr/m <sup>3</sup>			m <sup>3</sup>
Comments								
Total *See Footnotes	27	180	~100%	-	1	7	~100%	-



Alta Environmental, an NV5 Inc. 3777 Long Beach Blvd., Annex Bldg Long Beach CA, 90807 Attn: Nicole Naggar Project: **SMSD-22-10989 / SMASH/MUIR** Condition of Sample(s) Upon Receipt: Acceptable 
 Date Collected:
 5/14/2022

 Date Received:
 5/16/2022

 Date Analyzed:
 5/16/2022

 Date Reported:
 5/16/2022

 Project ID:
 22017996

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Client Sample #		3389	-0101		3389-0149				
Sample Location		R-480 N/.E S	ide Interior		R-455 No. Ctr. Interior				
Sample Volume (L)		15	50			15	50		
Lab Sample #		220179	96-005			220179	/996-006		
Spore Identification	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	
Alternaria	6	40	18	-	-	-	-	-	
ascospores	1	7	3	-	3	20	10	-	
basidiospores	-	-	-	-	2	13	7	-	
Chaetomium	1	7	3	-	-	-	-	-	
Cladosporium	3	20	9	-	11	73	38	-	
Drechslera/Bipolaris group	4	27	12	-	-	-	-	-	
hyphal elements	13	87	39	-	6	40	21	-	
Penicillium/Aspergillus group	1	7	3	-	5	33	17	-	
Smuts,Periconia,Myxomycetes	4	27	12	-	2	13	7	-	
	Debris Rating <b>3</b>				Debris Rating 3				
Analytical Sensitivity	Analytical Sensitivity: 7 spr/m <sup>3</sup>			′m³	An	alytical Sens	itivity: <b>7</b> spr/	m <sup>3</sup>	
Comments									
Total *See Footnotes	33	220	~100%	-	29	193	~100%	-	

Client Sample #		3389-1255				3436-2483			
Sample Location	R-	565 E/Ctr. By	/ Sink Interior		R-555 S/E Side Interior				
Sample Volume (L)		1	50			15	50		
Lab Sample #		220179	96-007			220179	96-008		
Spore Identification	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	
Alternaria	-	-	-	-	1	7	14	-	
ascospores	-	-	-	-	1	7	14	-	
Cladosporium	2	13	25	-	2	13	29	-	
hyphal elements	4	27	50	-	2	13	29	-	
Penicillium/Aspergillus group	1	7	13	-	-	-	-	-	
Smuts,Periconia,Myxomycetes	1	7	13	-	-	-	-	-	
Torula	-	-	-	-	1	7	14	-	
		Debris Rating 3			Debris Rating 2				
Analytical Sensitivity	Ar	Analytical Sensitivity: <b>7</b> spr/m <sup>3</sup>			Analytical Sensitivity: <b>7</b> spr/m <sup>3</sup>			′m³	
Comments									
Total *See Footnotes	8	53	~100%	-	7	47	~100%	-	



Certificate of Analysis AIHA-LAP EMLAP# 218951

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Date Analyzed:	5/16/2022
Date Reported:	5/16/2022
Project ID:	22017996
	Page 3 of 4

Client Sample #		3436-2485					
Sample Location	C	Outdoor Deck 2nd Fl. By R-555 Exterior					
Sample Volume (L)		1	50				
Lab Sample #		220179	996-009				
Spore Identification	RawCt	spr/m <sup>3</sup>	%Ttl	I/O			
Alternaria	3	20	4	-			
ascospores	14	93	16	-			
basidiospores	7	47	8	-			
Cladosporium	23	153	27	-			
Drechslera/Bipolaris group	4	27	5	-			
hyphal elements	13	87	15	-			
Penicillium/Aspergillus group	8	53	9	-			
Pithomyces	1	7	1	-			
Smuts,Periconia,Myxomycetes	12	80	14	-			
		Debris Rating 2					
Analytical Sensitivity		Analytical Sensitivity: 7 spr/m <sup>3</sup>					
Comments							
Total *See Footnotes	85	567	~100%	_			
	•	•	· •				



Alta Environmental, an NV5 Inc.	Date Collected:	5/14/2022
3777 Long Beach Blvd., Annex Bldg	Date Received:	5/16/2022
Long Beach CA, 90807	Date Analyzed:	5/16/2022
Attn: Nicole Naggar	Date Reported:	5/16/2022
Project: SMSD-22-10989 / SMASH/MUIR	Project ID:	22017996
Condition of Sample(s) Upon Receipt: Acceptable		Page 4 of 4

#### Footnotes and Additional Report Information

#### **Debris Rating Table**

	-	
1	Minimal (<5%) particulate present	Reported values are minimally affected by particulate load.
2	5% to 25% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
3	26% to 75% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
4	75% to 90% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
	Greater than 90% of the trace occluded with particulate	Quantification not possible due to large negative bias. A new sample should be collected at a shorter time interval or other measures taken to reduce particulate load.

Aerobiology Laboratory Associates, Inc. shall be responsible for all the information provided in the report, except when information is provided by the customer. Data provided by a customer can affect the validity of results and shall be clearly identified. Results apply to the samples as received. Aerobiology Laboratory Associates, Inc. is not responsible for the sampling activity, such as air and water volume, area, and mass unit. The report shall not be reproduced except in full without the approval of the laboratory to ensure that parts of a report are not taken out of context. Data interpretation of this report will be the client responsibility based on their sampling.

1. Penicillium/Aspergillus group spores are characterized by their small size, round to ovoid shape, being unicellular, and usually colorless to lightly pigmented. There are numerous genera of fungi whose spore morphology is similar to that of the Penicillium/Aspergillus type. Two common examples would be Paecilomyces and Acremonium. Although the majority of spores placed in this group are Penicillium, Aspergillus, or a combination of both. Keep in mind that these are not the only two possibilities.

2. Ascospores are sexually produced fungal spores formed within an ascus. An ascus is a sac-like structure designed to discharge the ascospores into the environment, e.g. Ascobolus.

3. Basidiospores are typically blown indoors from outdoors and rarely have an indoor source. However, in certain situations a high basidiospore count indoors may be indicative of a wood decay problem or wet soil.

4. The colorless group contains colorless spores which were unidentifiable to a specific genus. Examples of this group include Acremonium, Aphanocladium, Beauveria, Chrysosporium, Engyodontium microconidia, yeast, some arthrospores, as well as many others.

5. Hyphae are the vegetative mode of fungi. Hyphal elements are fragments of individual Hyphae. They can break apart and become airborne much like spores and are potentially allergenic. A mass of hyphal elements is termed the mycelium. Hyphae in high concentration may be indicative of colonization.

6. Dash (-) in this report, under raw count column means 'not detected (ND)'; otherwise 'not applicable' (NA).

7. The positive-hole correction factor is a statistical tool which calculates a probable count from the raw count, taking into consideration that multiple particles can impact on the same hole; for this reason the sum of the calculated counts may be less than the positive hole corrected total.

8. Due to rounding totals may not equal 100%.

9. Analytical Sensitivity for each spores is different for Non-viable sample when the spores are read at different percentage. Analytical Sensitivity is calculated as  $spr/m^{-3}$  divided by raw count.  $spr/m^{-3} = raw$  counts x (100/ % read) x (1000/Sample volume). If Analytical Sensitivity is 13  $spr/m^{-3}$  at 100% read, Analytical Sensitivity at 50% read would be 27  $spr/m^{-3}$ , which is 2 times higher. Analytical Sensitivity provided on the report is based on an assumed 100% of the trace being analyzed.

10. Minimum Reporting Limits (MRL) for BULKS, DUSTS, SWABS, and WATER samples are a calculation based on the sample size and the dilution plate on which the organism was counted. Results are a compilation of counts taken from multiple dilutions and multiple medias. This means that every genus of fungi or bacteria recovered can be counted on the plate on which it is best represented.

11. If the final quantitative result is corrected for contamination based on the blank, the blank correction is stated in the sample comments section of the report.

12. The results in this report are related to this project and these samples only.

13. For samples with an air volume of < 100L, the number of significant figures in the result should be considered (2) two. For samples with air volumes between 100-999L, the number of significant figures in the result should considered (3) three. For example, a sample with a result of 55,443 spr/m<sup>3</sup>from a 75L sample using significant figures should be considered 55,000. The same result of 55,443 from a 150L sample using significant figures should be considered 55,400 spr/m <sup>3</sup>.

14. If the In/Out ratio is greater than 100 times it is indicated >100/1, rather than showing the real value.

Terminology Used in Direct Exam Reporting

Conidiophores are a type of modified hyphae from which spores are born. When seen on a surface sample in moderate to numerous concentrations they may be indicative of fungal growth.

Sygne 5. Bluing

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R	AE	ASSOCIATES		PORATED tory	h I ba 17996	ELITE	Pag NVLAO AZ, CA, CO, VA	e of VA - 102977 AZ - 210229 CA - 218951 CO - 192683 DH - 07277 CA - 182691				
Aero	biolog	gy Client	Alta/N	VS		GA, IL, VA, NJ		FL-228303 L-232279				
Field	Contac	Nicole I	Vaggar		Collected By/Date Victor Sc	· 5/14/22	Relinquished By/Date:	" stspin				
Re	eporting	3777 Long Bea	ach Blvd Annex Bldg	Long Beach, CA 90807	Relinquished By/Da	ate:	Received By/Date:	22 9:03AM				
P	Billing	3777 Long Ber	ach Blyd Anney Bida	ong Beach CA 90807	Sampler	Andersen	Andersen SampleAire Other					
A	Address	STIT LONG Dec										
Pho	one/Fax	310-850-	5320		SIV	150-22-1090	9					
Er	mail (s	nicole.naggar@	2nv5.com and theres	e.rizarri@nv5.com	Project Name:	SMASH/MU	IR					
Rou	Routine 24 Hour Same Day 4 Hour 2 Hour Notes: Rush											
SAM	PLIN	S LOCATIO	N ZIP CODE	90 405	CC Info:							
		A land	Test Code		Sample I	ocation		Total Volume/Area				
S	ampl	e No.	Test Code		Sample	Jucation						
33 8	39.	1253	1054	R- 415 No	. ctr.	In	terio-	150				
2		1248	1054	R-410 N/	Ē		1	1				
3		0099	1054	Rm You S/	w							
4		1247	1054	R- 403 ct.	-							
5		0101	1054	R- 480 NA	E side							
6		0149	1054	R-455 N.	o. ctr.							
7	L	1255	1054	R-565 E,	lct. 6.	756						
8 34	36	2483	1054	R- 555 5	JE sid	le /						
9	L	2485	1054	2-1 fl. by	Rm 555	- Ex	ferior	1				
a												
1												
2												
3												
4		1.										
15	E MISSING TANK D											
10	054	Direct, Non	-viable Spore Tra	p	1015	Culture - WAT	ER Legionella					
10	051	Direct, Qua	litative- Swab/Ta	pe	1017	WATER - Pota	ble - E. coli/total colifo	orms				
10	005	AIR Culture	- Bacterial Coun	tw/ID's	1012	SWAB - E. coli	/total coliforms	arolfacal coliforme)				
10	030	AIR Culture	- Fungal Count v	// ID's punt w/ ID's	2056	WATER - Hete	rotrophic Plate Count					
10	031	SWAB Cult	ure - Fungal Cou	nt w/ ID's	3001	ASBESTOS - F	Point count					
10	800	BULK Cultu	re - Bacterial Co	unt w/ ID's	3002	ASBESTOS - P	LM Analysis Particle characterizatio	00				
10	007	BULK Cult	Iture - Bacterial (	Count w/ID's	3003	ASBESTOS - F	SBESTOS - Particle characterization					

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#### **Certificate of Analysis** AIHA-LAP EMLAP# 218951

15061 Springdale St Suite 111 Huntington Beach, CA 92649 7148958401

Alta Environmental, an NV5 Inc. 3777 Long Beach Blvd., Annex Bldg Long Beach CA, 90807 Attn: Nicole Naggar Project: **SMSD-22-10989 / SMASH/MUIR** 

Condition of Sample(s) Upon Receipt: Acceptable

 Date Collected:
 5/15/2022

 Date Received:
 5/16/2022

 Date Analyzed:
 5/16/2022

 Date Reported:
 5/16/2022

 Project ID:
 22018002

 Page 1 of 3
 3

	1054 Spore	Trap Analysi	s SOP 3.8: Sa	me Day TAT					
Client Sample #		3436	2468			3436	2466		
Sample Location		Room 2	00 E/Ctr.		Room 200 West Side				
Sample Volume (L)		1	50			1	50		
Lab Sample #		220180	02-001			22018002-002			
Spore Identification	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	RawCt spr/m <sup>3</sup> %Ttl I/			I/O	
Alternaria	3	20	43	-	1	7	9	-	
ascospores	1	7	14	-	1	7	9	-	
Cladosporium	3	20	43	-	6	40	55	-	
Drechslera/Bipolaris group	-	-	-	-	1	7	9	-	
hyphal elements	-	-	-	-	1	7	9	-	
Torula	-	-	-	-	1	7	9	-	
		Debris I	Rating <b>2</b>			Debris I	Rating <b>2</b>		
Analytical Sensitivity	An	alytical Sens	itivity: <b>7</b> spr/	m <sup>3</sup>	An	alytical Sens	itivity: <b>7</b> spr/	′m <sup>3</sup>	
Comments									
Total *See Footnotes	7	47	~100%	-	11	73	~100%	-	

Client Sample #		3436	2491		3436 2490				
Sample Location		Room 2	210B Ctr.		Room 205 Ctr.				
Sample Volume (L)		1	50		150				
Lab Sample #		220180	02-003			220180	02-004		
Spore Identification	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	
Alternaria	2	13	7	-	-	-	-	-	
ascospores	4	27	14	-	-	-	-	-	
basidiospores	1	7	4	-	1	7	25	-	
Cladosporium	5	33	18	-	3	20	75	-	
Drechslera/Bipolaris group	3	20	11	-	-	-	-	-	
hyphal elements	6	40	21	-	-	-	-	-	
Penicillium/Aspergillus group	1	7	4	-	-	-	-	-	
Smuts, Periconia, Myxomycetes	6	40	21	-	-	-	-	-	
		Debris I	Rating <b>3</b>			Debris F	Rating <b>2</b>		
Analytical Sensitivity	An	alytical Sens	itivity: <b>7</b> spr/i	m <sup>3</sup>	An	alytical Sens	itivity: <b>7</b> spr/	′m <sup>3</sup>	
Comments									
Total *See Footnotes	28	187	~100%	-	4	27	~100%	-	



#### **Certificate of Analysis** AIHA-LAP EMLAP# 218951

Alta Environmental, an NV5 Inc. 3777 Long Beach Blvd., Annex Bldg

Long Beach CA, 90807

Attn: Nicole Naggar

### Project: SMSD-22-10989 / SMASH/MUIR

Condition of Sample(s) Upon Receipt: Acceptable

 Date Collected:
 5/15/2022

 Date Received:
 5/16/2022

 Date Analyzed:
 5/16/2022

 Date Reported:
 5/16/2022

 Project ID:
 22018002

 Page 2 of 3
 2

Client Sample #		3436	2488			3436	2480		
Sample Location		Room	665 Ctr.		Room 660 S/W				
Sample Volume (L)		1	50			1	50		
Lab Sample #		22018002-005				220180	02-006		
Spore Identification	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	
Alternaria	2	13	10	-	-	-	-	-	
ascospores	2	13	10	-	2	13	11	-	
basidiospores	1 7 5 -				5	33	26	-	
Cladosporium	12	12 80 57 -				-	-	-	
hyphal elements	2	13	10	-	1	7	5	-	
Penicillium/Aspergillus group	2	13	10	-	-	-	-	-	
Smuts,Periconia,Myxomycetes	-	-	-	-	11	73	58	-	
		Debris I	Rating <b>2</b>			Debris I	Rating <b>2</b>		
Analytical Sensitivity	Analytical Sensitivity: <b>7</b> spr/m <sup>3</sup>				An	alytical Sens	itivity: <b>7</b> spr/	′m <sup>3</sup>	
Comments									
Total *See Footnotes	21	140	~100%	-	19	127	~100%	-	

Client Sample #		3436	2489		3436 2477				
Sample Location		Room (	665 N/E		Exterior West Side Rm 200 By Entrance				
Sample Volume (L)		1	50		150				
Lab Sample #	22018002-007					220180	02-008		
Spore Identification	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	
Alternaria	-	-	-	-	2	13	5	-	
Cladosporium	5	5 33 83 -		26	173	59	-		
hyphal elements	1	1 7 17 -				20	7	-	
Penicillium/Aspergillus group	-	-	-	-	2	13	5	-	
Smuts,Periconia,Myxomycetes	-	-	-	-	11	73	25	-	
		Debris I	Rating <b>2</b>			Debris I	Rating <b>2</b>		
Analytical Sensitivity	An	alytical Sens	itivity: <b>7</b> spr/	m <sup>3</sup>	An	alytical Sens	itivity: <b>7</b> spr/	′m <sup>3</sup>	
Comments									
Total *See Footnotes	6	40	~100%	-	44	293	~100%	-	



Alta Environmental, an NV5 Inc.	Date Collected:	5/15/2022
3777 Long Beach Blvd., Annex Bldg	Date Received:	5/16/2022
Long Beach CA, 90807	Date Analyzed:	5/16/2022
Attn: Nicole Naggar	Date Reported:	5/16/2022
Project: SMSD-22-10989 / SMASH/MUIR	Project ID:	22018002
Condition of Sample(s) Upon Receipt: Acceptable		Page 3 of 3

#### Footnotes and Additional Report Information

#### **Debris Rating Table**

1	Minimal (<5%) particulate present	Reported values are minimally affected by particulate load.
2	5% to 25% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
3	26% to 75% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
4	75% to 90% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
5	Greater than 90% of the trace occluded with particulate	Quantification not possible due to large negative bias. A new sample should be collected at a shorter time interval or other measures taken to reduce particulate load.

Aerobiology Laboratory Associates, Inc. shall be responsible for all the information provided in the report, except when information is provided by the customer. Data provided by a customer can affect the validity of results and shall be clearly identified. Results apply to the samples as received. Aerobiology Laboratory Associates, Inc. is not responsible for the sampling activity, such as air and water volume, area, and mass unit. The report shall not be reproduced except in full without the approval of the laboratory to ensure that parts of a report are not taken out of context. Data interpretation of this report will be the client responsibility based on their sampling.

1. Penicillium/Aspergillus group spores are characterized by their small size, round to ovoid shape, being unicellular, and usually colorless to lightly pigmented. There are numerous genera of fungi whose spore morphology is similar to that of the Penicillium/Aspergillus type. Two common examples would be Paecilomyces and Acremonium. Although the majority of spores placed in this group are Penicillium, Aspergillus, or a combination of both. Keep in mind that these are not the only two possibilities.

2. Ascospores are sexually produced fungal spores formed within an ascus. An ascus is a sac-like structure designed to discharge the ascospores into the environment, e.g. Ascobolus.

3. Basidiospores are typically blown indoors from outdoors and rarely have an indoor source. However, in certain situations a high basidiospore count indoors may be indicative of a wood decay problem or wet soil.

4. The colorless group contains colorless spores which were unidentifiable to a specific genus. Examples of this group include Acremonium, Aphanocladium, Beauveria, Chrysosporium, Engyodontium microconidia, yeast, some arthrospores, as well as many others.

5. Hyphae are the vegetative mode of fungi. Hyphal elements are fragments of individual Hyphae. They can break apart and become airborne much like spores and are potentially allergenic. A mass of hyphal elements is termed the mycelium. Hyphae in high concentration may be indicative of colonization.

6. Dash (-) in this report, under raw count column means 'not detected (ND)'; otherwise 'not applicable' (NA).

7. The positive-hole correction factor is a statistical tool which calculates a probable count from the raw count, taking into consideration that multiple particles can impact on the same hole; for this reason the sum of the calculated counts may be less than the positive hole corrected total.

8. Due to rounding totals may not equal 100%.

9. Analytical Sensitivity for each spores is different for Non-viable sample when the spores are read at different percentage. Analytical Sensitivity is calculated as  $spr/m^{3}$  divided by raw count.  $spr/m^{3}$  = raw counts x (100/ % read) x (1000/Sample volume). If Analytical Sensitivity is 13  $spr/m^{3}$  at 100% read, Analytical Sensitivity at 50% read would be 27  $spr/m^{3}$ , which is 2 times higher. Analytical Sensitivity provided on the report is based on an assumed 100% of the trace being analyzed.

10. Minimum Reporting Limits (MRL) for BULKS, DUSTS, SWABS, and WATER samples are a calculation based on the sample size and the dilution plate on which the organism was counted. Results are a compilation of counts taken from multiple dilutions and multiple medias. This means that every genus of fungi or bacteria recovered can be counted on the plate on which it is best represented.

11. If the final quantitative result is corrected for contamination based on the blank, the blank correction is stated in the sample comments section of the report.

12. The results in this report are related to this project and these samples only.

13. For samples with an air volume of < 100L, the number of significant figures in the result should be considered (2) two. For samples with air volumes between 100-999L, the number of significant figures in the result should considered (3) three. For example, a sample with a result of  $55,443 \text{ spr/m}^3$  from a 75L sample using significant figures should be considered 55,000. The same result of  $55,443 \text{ from a } 150L \text{ sample using significant figures should be considered } 55,400 \text{ spr/m}^3$ .

14. If the In/Out ratio is greater than 100 times it is indicated >100/1, rather than showing the real value.

Terminology Used in Direct Exam Reporting

Conidiophores are a type of modified hyphae from which spores are born. When seen on a surface sample in moderate to numerous concentrations they may be indicative of fungal growth.

Synam 5. Bluing

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V	A	ASSOCIATE A Pace	Gy <u>S</u> Labor s, INCOR Analytical® Labor	ORATORY PORATED atory	220	018002	ELITE		e of VA - 102877 AZ - 210229				
A	erobiol	logy Client	Alta/N	NS			AZ, CA, CO, FL, GA, IL, VA, NJ	CO, VA	CA-218951 CO-192683 NJ-102747 GA-163063 FL-228303 L-232279				
Fi	ield Cont	act Nicole	Naggar			Collected By/Date	\$/15/22	Relinquished By/Date:	5/15/2022				
	Report	ang 3777 Long Be	ach Blvd Annex Bldg	Long Beach, CA	90807	Relinquished By/Da	te:	Received By/Date:	2 gimen				
	Bill	ing 3777 Long Be	ach Blvd Annex Bldg	Long Beach, CA	90807	Sampler Andersen SampleAire Other							
-	Phone/F	310-850	-5320			PO#/Job#:SM	SD-22-1098	9	Bioculture				
-	Report	ing nicole.nacgar	@nv5.com and theres	se.rizarri@nv5.cor	n	Project Name: CMA CH/MI IID							
	Email Routine	(s) 24 Hour	Same Day	4 Hour	2 Hour	Notes:							
s		NG LOCATIO		9 . 4		CC Info:	112						
=			TestOrda	1070		O and to t			T-1-13/-1				
$\vdash$	Sam	ple No.	Test Code			Sample L	ocation		Total Volume/Area				
1 3	436	2468	1054	Room	200	E/ct			150				
2	1	2466	1054	4		weits.	le		1				
3		2491	1054	Roo- 2	103	ctr.							
4		2490	1054	1 2	05	1							
5		2488	1054	Noo-	665	ctr.							
6		2480	1054	Roo-	660	s/u							
7		2489	1054	Noor 6	65	NIE							
8	1	2477	1054	Exterio- weitsid	ie R-	200 54 6	er trance		1				
9													
11													
12													
13		4											
14													
15													
	1054	Direct, Non-	viable Spore Tra	p	1	1015	Culture - WATE	R Legionella					
	1051	Direct, Qual	itative- Swab/Tap	pe	_	1017	WATER - Potabl	e - E. coli/total coliforn	ns				
	1005	AIR Culture	- Bacterial Count	w/ID's		1012	SWAB - E. coli/t	otal coliforms					
-	1030	SWAR Culture	- Fungal Count w	// ID's		1028	SWAB - Sewage	Screen (E. coli/Entero	o/fecal coliforms)				
-	1031	SWAB Cult	ure - Fundal Cour	nt w/ ID's		3001	ASBESTOS - Po	int count					
	1008	BULK Cultu	re - Bacterial Cou	unt w/ ID's		3002	ASBESTOS - PL	M Analysis					
-	1033	BULK Cultu	re - Fungal Count	w/ID's		3003	ASBESTOS - Pa	rticle characterization					
-	1007	WATER Cu	Iture - Bacterial C	Count w/ID's		3004	ASBESTOS - PO	M Analysis					

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#### **Certificate of Analysis** AIHA-LAP EMLAP# 218951

15061 Springdale St Suite 111 Huntington Beach, CA 92649 7148958401

Alta Environmental, an NV5 Inc. 3777 Long Beach Blvd., Annex Bldg Long Beach CA, 90807 Attn: Nicole Naggar Project: **SMSD-22-10989 / SMASH/MUIR** 

Condition of Sample(s) Upon Receipt: Acceptable

 Date Collected:
 5/14/2022

 Date Received:
 5/16/2022

 Date Analyzed:
 5/16/2022

 Date Reported:
 5/16/2022

 Project ID:
 22018005

 Page 1 of 3
 2

	1054 Spore	Trap Analysi	s SOP 3.8: Sa	me Day TAT	Г				
Client Sample #		3389	-0105			3389	-1245		
Sample Location	F	R-410/415 Ex	kterior NE (O	)	R-610/615 Ext/ NW (O)				
Sample Volume (L)		1	50			1	50		
Lab Sample #		220180	05-001			220180	05-002		
Spore Identification	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	
Alternaria	1	7	1	-	-	-	-	-	
ascospores	1	7	1	-	1	7	4	-	
basidiospores	-	-	-	-	1	7	4	-	
Chaetomium	-	-	-	- 1 7 4				-	
Cladosporium	41	273	273 57 - 14 93		93	52	-		
hyphal elements	4	27	6	-	1	7	4	-	
Penicillium/Aspergillus group	3	20	4	-	4	27	15	-	
Rusts	2	13	3	-	-	-	-	-	
Smuts, Periconia, Myxomycetes	20	133	28	-	5	33	19	-	
		Debris I	Rating <b>3</b>		Debris Rating <b>2</b>				
Analytical Sensitivity	An	Analytical Sensitivity: <b>7</b> spr/m <sup>3</sup>				nalytical Sens	itivity: <b>7</b> spr/	m <sup>3</sup>	
Comments									
Total *See Footnotes	72	480	~100%	-	27	180	~100%	-	

Client Sample #		3389-0117				3389-1598				
Sample Location		R-515 Ex	kt. SE (O)		R-100 Ctr. (I)					
Sample Volume (L)		1	50		150					
Lab Sample #		220180	05-003		22018005-004					
Spore Identification	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	RawCt	spr/m <sup>3</sup>	%Ttl	I/O		
ascospores	1	7	6	-	2	13	18	-		
basidiospores					2	13	18	-		
Cladosporium	6	6 40 37 -			7	47	64	-		
hyphal elements	5	33	31	-	-	-	-	-		
Penicillium/Aspergillus group	2	13	12	-	-	-	-	-		
Smuts,Periconia,Myxomycetes	2	13	12	-	-	-	-	-		
		Debris I	Rating <b>2</b>			Debris F	Rating <b>2</b>			
Analytical Sensitivity	An	Analytical Sensitivity: <b>7</b> spr/m <sup>3</sup>				alytical Sens	itivity: <b>7</b> spr/	′m <sup>3</sup>		
Comments										
Total *See Footnotes	16	107	~100%	-	11	73	~100%	-		



#### **Certificate of Analysis** AIHA-LAP EMLAP# 218951

Alta Environmental, an NV5 Inc. 3777 Long Beach Blvd., Annex Bldg Long Beach CA, 90807 Attn: Nicole Naggar

### Project: SMSD-22-10989 / SMASH/MUIR

Condition of Sample(s) Upon Receipt: Acceptable

 Date Collected:
 5/14/2022

 Date Received:
 5/16/2022

 Date Analyzed:
 5/16/2022

 Date Reported:
 5/16/2022

 Project ID:
 22018005

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 2

Client Sample #		3436	-2492			3436	-2464		
Sample Location		R-500 S	o Ctr. (I)		R-515 No Ctr. (I)				
Sample Volume (L)		15	50		150				
Lab Sample #		220180	05-005			220180	05-006		
Spore Identification	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	
ascospores	-	-	-	-	4	27	67	-	
Cladosporium	4	27	80	-	-	-	-	-	
hyphal elements	-	-	-	-	1	7	17	-	
Penicillium/Aspergillus group	-	-	-	-	1	7	17	-	
Smuts, Periconia, Myxomycetes	1	7	20	-	-	-	-	-	
	Debris Rating <b>2</b> Debri					Debris	Rating <b>2</b>		
Analytical Sensitivity	An	Analytical Sensitivity: <b>7</b> spr/m <sup>3</sup>				alytical Sens	sitivity: <b>7</b> spr/	′m <sup>3</sup>	
Comments									
Total *See Footnotes	5	5 33 ~100% - 6 40					~100%	-	
		•						-	

Client Sample #		3436	-2462		3436-2487			
Sample Location		R-480 Ex	ct SW (O)		R-655 Ext SE (O)			
Sample Volume (L)		1	50		150			
Lab Sample #		220180	05-007			220180	05-008	
Spore Identification	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	RawCt	spr/m <sup>3</sup>	%Ttl	I/O
Alternaria	1	1 7 6 -				7	6	-
ascospores	1	1 7 6 -				7	6	-
Cladosporium	12	12 80 75 -				67	62	-
hyphal elements	-	-	-	-	1	7	6	-
Penicillium/Aspergillus group	1	7	6	-	1	7	6	-
Smuts,Periconia,Myxomycetes	1	7	6	-	2	13	12	-
		Debris I	Rating <b>2</b>		Debris Rating <b>2</b>			
Analytical Sensitivity	Analytical Sensitivity: <b>7</b> spr/m <sup>3</sup>				An	alytical Sens	itivity: <b>7</b> spr/	′m <sup>3</sup>
Comments								
Total *See Footnotes	16	107	~100%	-	16	107	~100%	-



Alta Environmental, an NV5 Inc.	Date Collected:	5/14/2022
3777 Long Beach Blvd., Annex Bldg	Date Received:	5/16/2022
Long Beach CA, 90807	Date Analyzed:	5/16/2022
Attn: Nicole Naggar	Date Reported:	5/16/2022
Project: SMSD-22-10989 / SMASH/MUIR	Project ID:	22018005
Condition of Sample(s) Upon Receipt: Acceptable		Page 3 of 3

#### Footnotes and Additional Report Information

#### **Debris Rating Table**

1	Minimal (<5%) particulate present	Reported values are minimally affected by particulate load.
2	5% to 25% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
3	26% to 75% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
4	75% to 90% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
5	Greater than 90% of the trace occluded with particulate	Quantification not possible due to large negative bias. A new sample should be collected at a shorter time interval or other measures taken to reduce particulate load.

Aerobiology Laboratory Associates, Inc. shall be responsible for all the information provided in the report, except when information is provided by the customer. Data provided by a customer can affect the validity of results and shall be clearly identified. Results apply to the samples as received. Aerobiology Laboratory Associates, Inc. is not responsible for the sampling activity, such as air and water volume, area, and mass unit. The report shall not be reproduced except in full without the approval of the laboratory to ensure that parts of a report are not taken out of context. Data interpretation of this report will be the client responsibility based on their sampling.

1. Penicillium/Aspergillus group spores are characterized by their small size, round to ovoid shape, being unicellular, and usually colorless to lightly pigmented. There are numerous genera of fungi whose spore morphology is similar to that of the Penicillium/Aspergillus type. Two common examples would be Paecilomyces and Acremonium. Although the majority of spores placed in this group are Penicillium, Aspergillus, or a combination of both. Keep in mind that these are not the only two possibilities.

2. Ascospores are sexually produced fungal spores formed within an ascus. An ascus is a sac-like structure designed to discharge the ascospores into the environment, e.g. Ascobolus.

3. Basidiospores are typically blown indoors from outdoors and rarely have an indoor source. However, in certain situations a high basidiospore count indoors may be indicative of a wood decay problem or wet soil.

4. The colorless group contains colorless spores which were unidentifiable to a specific genus. Examples of this group include Acremonium, Aphanocladium, Beauveria, Chrysosporium, Engyodontium microconidia, yeast, some arthrospores, as well as many others.

5. Hyphae are the vegetative mode of fungi. Hyphal elements are fragments of individual Hyphae. They can break apart and become airborne much like spores and are potentially allergenic. A mass of hyphal elements is termed the mycelium. Hyphae in high concentration may be indicative of colonization.

6. Dash (-) in this report, under raw count column means 'not detected (ND)'; otherwise 'not applicable' (NA).

7. The positive-hole correction factor is a statistical tool which calculates a probable count from the raw count, taking into consideration that multiple particles can impact on the same hole; for this reason the sum of the calculated counts may be less than the positive hole corrected total.

8. Due to rounding totals may not equal 100%.

9. Analytical Sensitivity for each spores is different for Non-viable sample when the spores are read at different percentage. Analytical Sensitivity is calculated as spr/m<sup>3</sup> divided by raw count. spr/m<sup>3</sup> = raw counts x (100/ % read) x (1000/Sample volume). If Analytical Sensitivity is 13 spr/m<sup>3</sup> at 100% read, Analytical Sensitivity at 50% read would be 27 spr/m<sup>3</sup>, which is 2 times higher. Analytical Sensitivity provided on the report is based on an assumed 100% of the trace being analyzed.

10. Minimum Reporting Limits (MRL) for BULKS, DUSTS, SWABS, and WATER samples are a calculation based on the sample size and the dilution plate on which the organism was counted. Results are a compilation of counts taken from multiple dilutions and multiple medias. This means that every genus of fungi or bacteria recovered can be counted on the plate on which it is best represented.

11. If the final quantitative result is corrected for contamination based on the blank, the blank correction is stated in the sample comments section of the report.

12. The results in this report are related to this project and these samples only.

13. For samples with an air volume of < 100L, the number of significant figures in the result should be considered (2) two. For samples with air volumes between 100-999L, the number of significant figures in the result should considered (3) three. For example, a sample with a result of  $55,443 \text{ spr/m}^3$  from a 75L sample using significant figures should be considered 55,000. The same result of  $55,443 \text{ from a } 150L \text{ sample using significant figures should be considered } 55,400 \text{ spr/m}^3$ .

14. If the In/Out ratio is greater than 100 times it is indicated >100/1, rather than showing the real value.

Terminology Used in Direct Exam Reporting

Conidiophores are a type of modified hyphae from which spores are born. When seen on a surface sample in moderate to numerous concentrations they may be indicative of fungal growth.

Synam 5. Bluing

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	Aer	ASSOCIATE A Pace	Gy <u>S</u> Labo s, Incor Analytical® Labor	DRATORY PORATED atory	22018005			e of VA - 102977 AZ-21022 CA-218951 CO-1926
A	erobiolog	y Client	Alter/	NVS		GA, IL, VA, NJ	CO, VA	NJ - 102747 GA- 1630 FL - 228303 L - 23221
F	ield Contact	Nicole	Naggar	_	Collected By/Dat	···· 05/14/22	Relinquished By/Date:	p flisler
-	Reporting Address	3777 Long Be	ach Blvd Annex Bldg	Long Beach, CA 90807	Relinquished By/D	ate:	Received By/Date:	2 9:00A
	Billing	3777 Long Be	ach Blvd Annex Bldg	Long Beach, CA 90807	Sampler	Andersen	SampleAire AeroTrap	Other BioCulture
	Phone/Eav	310-850	-5320		PO#/Job#:SN	ISD-22-1098	9	Diooditare
	Reporting	nicole nangar	2005 com and there		Project Name:	SMASH/MI II	P	
-	Email (s) Routine	24 Hour	Same Day	4 Hour 2 H	Hour Notes: /	SIMASHINIO	N	
	<u> </u>		X		I The Road	1.6		
S	AMPLING	LOCATIO	N ZIP CODE	90405	CC Info:			
	Sample	e No.	Test Code		Sample L	ocation		Total Volume/A
3	389.	0105	1054	R-410/415	extension A	JE	(0)	150
2 3	3389.1	245	1054	R- 610/615	rext. No	~	(0)	150
3	3789. 0	5117	1054	R-515 e.	++. SE		(0)	150
3	389.1	598	1054	R-100 c	tr.		(I)	150
3	3436.	2492	1054	R-500 5	oct.		(I)	150
6	3436.	2464	1054	12-515 N	so etc.		(I)	150
	3436.	2462	1054	R-430 4	ert sw		(0)	150
	3436.	2487	1054	K-655	ext se		(0)	150
F	1054	Direct, Non-	viable Spore Tra	p	1015	Culture - WATE	R Legionella	- ABAR
E	1051	Direct, Qua	itative- Swab/Ta		1017	WATER - Potab	le - E. coli/total colifor	ms
F	1005	AIR Culture	- Bacterial Count	w/ID's	1012	SWAB - E. coli/t	otal coliforms	offood californes
E	1006	SWAB Cult	ure - Bacterial Co	unt w/ ID's	2056	WATER - Heter	otrophic Plate Count	oriecal conforms)
F	1031	SWAB Cult	ure - Fungal Cour	tw/ID's	3001	ASBESTOS - Po	bint count	
$\vdash$	1008	BULK Cultu	re - Bacterial Cou	Int w/ ID's	3002	ASBESTOS - PL	M Analysis	
	1007	WATER CI	ture - Bacterial (	Count w/ID's	3003	ASBESTOS - PO	M Analysis	

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#### **Certificate of Analysis** AIHA-LAP EMLAP# 218951

15061 Springdale St Suite 111 Huntington Beach, CA 92649 7148958401

Alta Environmental, an NV5 Inc. 3777 Long Beach Blvd., Annex Bldg Long Beach CA, 90807 Attn: Nicole Naggar Project: **SMSD-22-10989 / SMASH/MUIR** 

Condition of Sample(s) Upon Receipt: Acceptable

 Date Collected:
 5/15/2022

 Date Received:
 5/16/2022

 Date Analyzed:
 5/16/2022

 Date Reported:
 5/16/2022

 Project ID:
 22018007

 Page 1 of 3
 3

	1054 Spore	Trap Analysis	s SOP 3.8: Sai	me Day TAT					
Client Sample #		3436-2475				3436-2512			
Sample Location	R	m 200/205 E	xterior Ctr. (C	D)		Rm 610/615	Ext. NW (O)	1	
Sample Volume (L)		15	50			1!	50		
Lab Sample #		220180	07-001			220180	07-002		
Spore Identification	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	
ascospores	8	8 53 31 -				60	50	-	
basidiospores	-	-	-	-	1	7	6	-	
Cladosporium	8	8 53 31 -				27	22	-	
hyphal elements	-	-	-	-	1	7	6	-	
Oidium	4	27	15	-	-	-	-	-	
Penicillium/Aspergillus group	2	13	8	-	1	7	6	-	
Smuts, Periconia, Myxomycetes	4	27	15	-	2	13	11	-	
		Debris F	Rating <b>2</b>			Debris I	Rating <b>3</b>		
Analytical Sensitivity	An	Analytical Sensitivity: <b>7</b> spr/m <sup>3</sup>				Analytical Sensitivity: <b>7</b> spr/m <sup>3</sup>			
Comments									
Total *See Footnotes	26	173	~100%	-	18	120	~100%	-	

Client Sample #	3436-2506				3436-2481				
Sample Location	Rr	m 200 Ext. W	estside Ctr. (	0)	Rm 615 W Ctr. (I)				
Sample Volume (L)		1	50		150				
Lab Sample #		220180	07-003			220180	07-004		
Spore Identification	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	
ascospores	-					20	14	-	
basidiospores	-					20	14	-	
Cladosporium	10	10 67 67 -				40	29	-	
hyphal elements	5	33	33	-	4	27	19	-	
Penicillium/Aspergillus group	-	-	-	-	3	20	14	-	
Smuts,Periconia,Myxomycetes	-	-	-	-	2	13	10	-	
		Debris I	Rating <b>2</b>		Debris Rating <b>2</b>				
Analytical Sensitivity	Analytical Sensitivity: <b>7</b> spr/m <sup>3</sup>				Analytical Sensitivity: <b>7</b> spr/m <sup>3</sup>				
Comments									
Total *See Footnotes	15	100	~100%	-	21	140	~100%	-	



#### **Certificate of Analysis** AIHA-LAP EMLAP# 218951

Alta Environmental, an NV5 Inc. 3777 Long Beach Blvd., Annex Bldg

Long Beach CA, 90807 Attn: Nicole Naggar

### Project: SMSD-22-10989 / SMASH/MUIR

Condition of Sample(s) Upon Receipt: Acceptable

 Date Collected:
 5/15/2022

 Date Received:
 5/16/2022

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 5/16/2022

 Date Reported:
 5/16/2022

 Project ID:
 22018007

 Page 2 of 3
 2

Client Sample #		3436-	-2471		3436-2476				
Sample Location		Rm 605	5 SW (I)		Rm 600 NW (I)				
Sample Volume (L)		15	50			15	50		
Lab Sample #		220180	07-005		22018007-006				
Spore Identification	RawCt spr/m <sup>3</sup> %Ttl I/O				RawCt	spr/m <sup>3</sup>	%Ttl	I/O	
ascospores	3	20	27	-	-	-	-	-	
Cladosporium	6 40 55 -			2	13	40	-		
hyphal elements	-	-	-	-	1	7	20	-	
Penicillium/Aspergillus group	2	13	18	-	2	13	40	-	
	Debris Rating <b>2</b>				Debris Rating <b>2</b>				
Analytical Sensitivity	Analytical Sensitivity: <b>7</b> spr/m <sup>3</sup>				Analytical Sensitivity: <b>7</b> spr/m <sup>3</sup>				
Comments									
Total *See Footnotes	11	73	~100%	-	5	33	~100%	-	

Client Sample #		3436-2486						
Sample Location		Rm 600/60	5 Ext NE (O)		Bld, 600 Ext. So. Ctr. (O)			
Sample Volume (L)		15	50			15	50	
Lab Sample #		220180	07-007			220180	07-008	
Spore Identification	RawCt	spr/m <sup>3</sup>	%Ttl	I/O	RawCt	spr/m <sup>3</sup>	%Ttl	I/O
Alternaria	1	7	3	-	1	7	4	-
ascospores	1	7	3	-	6	40	22	-
Cladosporium	27	27 180 69 -				87	48	-
Drechslera/Bipolaris group	1	1 7 3 -				7	4	-
hyphal elements	3	20	8	-	2	13	7	-
Penicillium/Aspergillus group	4	27	10	-	-	-	-	-
Smuts,Periconia,Myxomycetes	1	7	3	-	4	27	15	-
Stachybotrys	1	7	3	-	-	-	-	-
		Debris I	Rating <b>2</b>			Debris F	Rating <b>2</b>	
Analytical Sensitivity	Analytical Sensitivity: <b>7</b> spr/m <sup>3</sup>			Analytical Sensitivity: <b>7</b> spr/m <sup>3</sup>				
Comments								
Total *See Footnotes	39	260	~100%	-	27	180	~100%	-



Alta Environmental, an NV5 Inc.	Date Collected:	5/15/2022
3777 Long Beach Blvd., Annex Bldg	Date Received:	5/16/2022
Long Beach CA, 90807	Date Analyzed:	5/16/2022
Attn: Nicole Naggar	Date Reported:	5/16/2022
Project: SMSD-22-10989 / SMASH/MUIR	Project ID:	22018007
Condition of Sample(s) Upon Receipt: Acceptable		Page 3 of 3

### Footnotes and Additional Report Information

#### **Debris Rating Table**

1	Minimal (<5%) particulate present	Reported values are minimally affected by particulate load.
2	5% to 25% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
3	26% to 75% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
4	75% to 90% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
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6. Dash (-) in this report, under raw count column means 'not detected (ND)'; otherwise 'not applicable' (NA).

7. The positive-hole correction factor is a statistical tool which calculates a probable count from the raw count, taking into consideration that multiple particles can impact on the same hole; for this reason the sum of the calculated counts may be less than the positive hole corrected total.

8. Due to rounding totals may not equal 100%.

9. Analytical Sensitivity for each spores is different for Non-viable sample when the spores are read at different percentage. Analytical Sensitivity is calculated as  $spr/m^{3}$  divided by raw count.  $spr/m^{3}$  = raw counts x (100/ % read) x (1000/Sample volume). If Analytical Sensitivity is 13  $spr/m^{3}$  at 100% read, Analytical Sensitivity at 50% read would be 27  $spr/m^{3}$ , which is 2 times higher. Analytical Sensitivity provided on the report is based on an assumed 100% of the trace being analyzed.

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Terminology Used in Direct Exam Reporting

Conidiophores are a type of modified hyphae from which spores are born. When seen on a surface sample in moderate to numerous concentrations they may be indicative of fungal growth.

Synam 5. Bluing

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A	ASSOCIATE A Pace	Gy <u>Labo</u> ES, <u>INCOR</u> Analytical® Labor	DRATORY PORATED atory	ا 220	ab Use: 18007	elite	Pag ÇAJVN	le of
Aerobiolo	av Client	Atta 1	AMIC			AZ, CA, CO, FL, GA, IL, VA, NJ	AZ, CA, CO, VA	VA - 102977 AZ - 210229 CA - 218951 CO - 192683 NJ - 102747 GA - 163063
Field Conta	Nicole	Naggar		-	Collected By/Da	te: 05/15/22	Relinquished By/Date:	5/15/2 Z
Reportin	3777 Long Be	each Blvd Annex Bldg	Long Beach, CA 9	0807	Relinquished By/	Date:	Received By/Date:	22 OronAn
Addres	g 3777 Long Be	ach Blvd Annex Bidg	Long Baach, CA 9	0807	Sampler	Andersen	SampleAire	Other
Addres	210 950	5220	Long South, of to		Type PO#/Job#: CI	SAS	AeroTrap	BioCulture
Phone/Fa Reportin			n daari@nuE aam		Project Name	CMACH/MI		
Email (s	24 Hour	Same Day	4 Hour	2 Hour	Notes: 0	SWASH/WU	R	
		o and a start		T	Kows. K	vsh		AND DESCRIPTION
SAMPLIN	G LOCATIO	N ZIP CODE	9040	5	CC Info:			
Samp	le No.	Test Code			Sample	Location		Total Volume/Area
3436.	2475	1054	12-200	1205 0	exptenses	ct. (0)		150
3436.	2512	1054	R-6101	615 e	st N	n (0)	-	150
3436.	2506	1054	R- 200	ext. u	eifs:de	ct (0)		150
3436.	2481	1054	R-Grs	i u ct	· · ,	(I)		150
3436.	2471	(osy	K-605	rsw		(I)		150
3436	. 2476	1054	1-600	Au		(I)		150
3436.	2478	1054	R- 600/	605 e	+ NE	(0)		150
3436	. 2436	(054	B11, 6	DD RA	l, So. c	t. (0)		150
								_
		-	1			114		
1054	Direct, Non	-viable Spore Tra	0		1015	Culture - WATE	R Legionella	
1051	Direct, Qua	litative- Swab/Tap	De		1017	Culture - SWAB	Legionella	
1050	AIR Culture	- Bacterial Count	w/ID's		1010	SWAR - F coli#	e - E. coli/total colifor	ms
1030	AIR Culture	- Fungal Count w	/ ID's		1028	SWAB - Sewage	Screen (E. coli/Enter	o/fecal coliforms)
1006	SWAB Cult	ure - Bacterial Co	unt w/ ID's		2056	WATER - Heter	otrophic Plate Count	
1031	SWAB Cult	ure - Fungal Coun	tw/ID's		3001	ASBESTOS - Po	pint count	
1008	BULK Cultu	re - Bacterial Cou	nt w/ ID's		3002	ASBESTOS - PL	M Analysis	
1033	BULK Cultu	re - Fungal Count	w/ ID's		3003	ASBESTOS - Pa	article characterization	1
1007	WATER CL	liture - Bacterial C	ount w/ID's		3004	ASBESTOS - PO	CM Analysis	

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Certificate of Analysis AIHA-LAP EMLAP# 218951 15061 Springdale St Suite 111 Huntington Beach, CA 92649 7148958401

1 per 5 fields

Alta Environmental, an NV5 Inc.	Date Collected:	5/15/2022	
3777 Long Beach Blvd., Annex Bldg	Date Received:	5/16/2022	
Long Beach CA, 90807	Date Analyzed:	5/16/2022	
Attn: Nicole Naggar	Date Reported:	5/16/2022	
Project: SMSD-22-10989 / SMASH/MUIR	Project ID:	22018012	
Condition of Sample(s) Upon Receipt: Acceptable		Page 1 of 2	
Client Sample #: T01	Lab Sample #:	22018012-001	
Sample Location: R-415 So Ctr. Behind Dry Erase Board			
Test: 1051 Surface, Swab - Qualitative Direct Microscopic Exam SOP 3.7: Same Day TAT			
Results:	Observatior	ı	
Occasional Alternaria spores seen	1-5 per cover slip		
Occasional Cladosporium spores seen	1-5 per cover slip		
Numerous Penicillium/Aspergillus group spores seen	3-4 per field (minimum)		
Numerous Stachybotrys spores seen	3-4 per field (minimum)		

Moderate hyphal elements seen

Debris Rating: 1



Alta Environmental, an NV5 Inc.	Date Collected:	5/15/2022
3777 Long Beach Blvd., Annex Bldg	Date Received:	5/16/2022
Long Beach CA, 90807	Date Analyzed:	5/16/2022
Attn: Nicole Naggar	Date Reported:	5/16/2022
Project: SMSD-22-10989 / SMASH/MUIR	Project ID:	22018012
Condition of Sample(s) Upon Receipt: Acceptable		Page 2 of 2

#### Footnotes and Additional Report Information

#### **Debris Rating Table**

1	Minimal (<5%) particulate present	Reported values are minimally affected by particulate load.
2	5% to 25% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
3	26% to 75% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
4	75% to 90% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
	Greater than 90% of the trace occluded with particulate	Quantification not possible due to large negative bias. A new sample should be collected at a shorter time interval or other measures taken to reduce particulate load.

Aerobiology Laboratory Associates, Inc. shall be responsible for all the information provided in the report, except when information is provided by the customer. Data provided by a customer can affect the validity of results and shall be clearly identified. Results apply to the samples as received. Aerobiology Laboratory Associates, Inc. is not responsible for the sampling activity, such as air and water volume, area, and mass unit. The report shall not be reproduced except in full without the approval of the laboratory to ensure that parts of a report are not taken out of context. Data interpretation of this report will be the client responsibility based on their sampling.

1. Penicillium/Aspergillus group spores are characterized by their small size, round to ovoid shape, being unicellular, and usually colorless to lightly pigmented. There are numerous genera of fungi whose spore morphology is similar to that of the Penicillium/Aspergillus type. Two common examples would be Paecilomyces and Acremonium. Although the majority of spores placed in this group are Penicillium, Aspergillus, or a combination of both. Keep in mind that these are not the only two possibilities.

2. Ascospores are sexually produced fungal spores formed within an ascus. An ascus is a sac-like structure designed to discharge the ascospores into the environment, e.g. Ascobolus.

3. Basidiospores are typically blown indoors from outdoors and rarely have an indoor source. However, in certain situations a high basidiospore count indoors may be indicative of a wood decay problem or wet soil.

4. The colorless group contains colorless spores which were unidentifiable to a specific genus. Examples of this group include Acremonium, Aphanocladium, Beauveria, Chrysosporium, Engyodontium microconidia, yeast, some arthrospores, as well as many others.

5. Hyphae are the vegetative mode of fungi. Hyphal elements are fragments of individual Hyphae. They can break apart and become airborne much like spores and are potentially allergenic. A mass of hyphal elements is termed the mycelium. Hyphae in high concentration may be indicative of colonization.

6. Dash (-) in this report, under raw count column means 'not detected (ND)'; otherwise 'not applicable' (NA).

7. The positive-hole correction factor is a statistical tool which calculates a probable count from the raw count, taking into consideration that multiple particles can impact on the same hole; for this reason the sum of the calculated counts may be less than the positive hole corrected total.

8. Due to rounding totals may not equal 100%.

9. Analytical Sensitivity for each spores is different for Non-viable sample when the spores are read at different percentage. Analytical Sensitivity is calculated as  $spr/m^{-3}$  divided by raw count.  $spr/m^{-3} = raw$  counts x (100/ % read) x (1000/Sample volume). If Analytical Sensitivity is 13  $spr/m^{-3}$  at 100% read, Analytical Sensitivity at 50% read would be 27  $spr/m^{-3}$ , which is 2 times higher. Analytical Sensitivity provided on the report is based on an assumed 100% of the trace being analyzed.

10. Minimum Reporting Limits (MRL) for BULKS, DUSTS, SWABS, and WATER samples are a calculation based on the sample size and the dilution plate on which the organism was counted. Results are a compilation of counts taken from multiple dilutions and multiple medias. This means that every genus of fungi or bacteria recovered can be counted on the plate on which it is best represented.

11. If the final quantitative result is corrected for contamination based on the blank, the blank correction is stated in the sample comments section of the report.

12. The results in this report are related to this project and these samples only.

13. For samples with an air volume of < 100L, the number of significant figures in the result should be considered (2) two. For samples with air volumes between 100-999L, the number of significant figures in the result should considered (3) three. For example, a sample with a result of 55,443 spr/m<sup>3</sup>from a 75L sample using significant figures should be considered 55,000. The same result of 55,443 from a 150L sample using significant figures should be considered 55,400 spr/m <sup>3</sup>.

14. If the In/Out ratio is greater than 100 times it is indicated >100/1, rather than showing the real value.

Terminology Used in Direct Exam Reporting

Conidiophores are a type of modified hyphae from which spores are born. When seen on a surface sample in moderate to numerous concentrations they may be indicative of fungal growth.

Sygne 5. Bluing

Suzanne Blevins Laboratory Director © 2022 Aerobiology Laboratory Associates, Inc. All rights reserved.

Actobiology Cherne HUA AVS	FL-228303 L-232279 ned By/Date: 5/15/27
Nicolo Noggor Collected By/Date: Relinquist	260
Field Contact INICOLE INAGGAT	v/Date:
Address	110/22 9:03AM
Address 3777 Long Beach Blvd Annex Bldg Long Beach, CA 90807 Sampler Andersen Sampler Andersen Sampler Address Address	roTrap BioCulture
Phone/Fax 310-850-5320 PO#/Job#: SMSD-22-10989	
Reporting nicole.naggar@nv5.com and therese.rizarri@nv5.com Project Name: SMASH/MUIR	
Routine 24 Hour Same Day 4 Hour 2 Hour Notes:	
SAMPLING LOCATION ZIP CODE G. Mass Country	
Sample No. Test Code Sample Location	Total Volume/Area
TOI [OSI R- 415 south. behind dry evole to	20-1
2	and an and a second
3	
4	
5	
7	
9	
1	
st	
4	
1054 Direct Non-vieble Spore Trep	
105         Cuture - WATER Legionella           1051         Direct, Qualitative- Swab/Tape         1017         Cuture - SWAB Legionella	
1050 Direct. Qualitative- Bulk 1010 WATER - Potable - E. coli/ 1005 AIR Culture - Bacterial Count w/ ID's 1012 SWAB - E. coli/total colifere	/total coliforms
1030 AIR Culture - Fungal Count w/ ID's 1028 SWAB - Sewage Screen (F	E. coli/Entero/fecal coliforms)
1000         SWAB Culture - Bacterial Count w/ ID's         2056         WATER - Heterotrophic Pl           1031         SWAB Culture - Fungal Count w/ ID's         3001         ASBESTOS - Point count	ate Count
1008 BULK Culture - Bacterial Count w/ ID's 3002 ASBESTOS - PLM Analysi	is
1033         BULK Culture - Fungal Count w/ ID's         3003         ASBESTOS - Particle char           1007         WATER Culture - Bacterial Count w/ID's         3004         ASBESTOS - PCM Analysis	acterization

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## **APPENDIX C – FIELD NOTES**

N V 5 Delivering Solutions Improving Lives

TEM-EPA Yama NIOSH-7082/Pb Sample Media: 25 mm MCE 0.8 25 mm MCE 0.4 37 mm MCE	Analytical Meth PCM-Niosh 7400 TEM-AHERA	Type: OWA = Outs	Colman 101	Cahronke	5271.0CE	12401-956	(000866	trailace	5600 by 6	8h2N965	521985 van	Sample Pun # #	Client: Project No.: Project Locatio		ALTA ENVIRONMENTAL
te Field Blank Sample # Fiber/Fields Fiber/Fields	0 Alta On-site	side Work Area: IWA = Inside Work Area: b - b	202 moore ha within 222	or sold path inda	pm 363 Elern by sin	AM 455 worthern.	Room 480 ale side.	Room 403 cm	Room you S/W	Room 410 N/E	Room 415 No. C.T.	np Sample Location	5M&NVSD 3M&D-22-10989 m: 25266thst Sauth Mu HUIR/SMHSH E.		
Rote	Mic		α	1 00	50	0	8	8	50	7 10	77	Туре	Survey C		
icle field area (mm r area (mm²): slide readable: ometer #:	i, P = Personal; C = Ci oscopist: oscope #:		L							Dara Brond	Ridgress	Activity in	A Soyos	Air Samplin	
<sup>2</sup> ):	earance		1370	t521	132	1301	12.52	1231	1001	1156	IIme	Start		g Form	
			1400	thei	1332	1315	1302	21721	1131	1206	Time	Stop			
On-Site Signatur	Commer		150	15.0	150	15-20	150	12.0	201	15:0	Start	LPM			
re:	nts:		150	15-0	17.0	150	17.0	15.0	14.2	15:0	Stop	LPM			
			150	150	150	150	12	120	150	150	VOIUTIN	Value	סד		
1 mar	Detection lin		1	J	5	) )			]	1	Fields	Fibers/	hate: 5/		
enchr	lit is 5.5 f/		1		1			11	1	)	F/CO		4/2002		





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NTA	СЛ

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Air Sampling Form

Client: Project No.: Project Location: SMMUSD SMSD-22-10989 2526 6th 5t. Santa Nouce (4, 90405

Date: <u>5-13-6-00</u> Page: <u>/ of /</u> 5-15-2022

MUII2/ SAMASH E.S

Sample #	Pump #	Sample Location	Туре	Activity in Progress	Start Time	Stop Time	LPM	LPM	Volume	Fibers/	F/CC*
8942982		Room 200 E/ com	U	PONE	6915	5260	170	12:0	150	]	)
31542466		Room 200 west side	B		£260	t\$60	0.51	1520	150	)	
13429848		KOOM ZIDB CTTZ	U		0440	2957	15.0	0.51	120	]	]
24395A20		Poom 205 CTR	Ø		5260	2005	150	1500	150		)
88427645		ROOM 665 CTR	8		1009	1019	201	170	120	]	)
13h296th		200m 660 5/W	50		1022	1032	150	15.0	150	)	
ATT 9646		poor 665 N/E	8		t501	<b>F</b>  d	152	15-0	120	]	1
Teh 29 Ehs		WEST = DE 2M200 antrend	00	L	1050	1100	150	201	156	1	

Type: OWA = Outside Work Area; IWA = Inside Work Area; B = Background; P = Personal; C = Clearance

	37 mm MCE	25 mm MCE 0.45 µg	25 mm MCE 0.8 µg	Sample Media:		NIOSH-7082/Pb	TEM-EPA Yamate	TEM-AHERA	PCM-Niosh 7400	Analytical Method:
Fiber/Fields	Sample #	Lab Blank		Fiber/Fields	Sample #	Field Blank		Outside Lab	Alta On-site	Sample Analysis:

Cert Number: 08-4470

On-Site Technician: Signature:

2 4704

Rotometer #:	Q.C. slide readable:	Filter area (mm <sup>2</sup> ):	Graticle field area (mm <sup>2</sup> ):	Microscope #:	Microscopist:

Comments:

Detection limit is 5.5 f/cc





PCM-Niosh 740( TEM-AHERA TEM-EPA Yama NIOSH-7082/Pb Sample Media: 25 mm MCE 0.8 37 mm MCE 0.45	Type: OWA = Outs		3436-2487 1	3436 462	3436-	3436 - 3646	3389-	5759	1 140 GIL 101 - 53 55	2390 Part Full	Client: Project No.: Project Locatio	
0 0 Alta On-site Outside Lab Field Blank Sample # Fiber/Fields Lab Blank Sample # Fiber/Fields	side Work Area; IWA = Inside Work Area; B =		K-655 ext. 5E (0)	(a) 7 7 0 0 1 (a)	L-SIS No ctr. (I	A-Soo South (1)	halon it is i	1- 610/61 Cot, now (	ob the riol ris extense NE (	Sample Location	5 MMUSO 5 MMUSO 5 MS9 - 22 -10989 MUR/SMASH ES	
Micr Grati Filte Roto	Background		2	، ه	2 2	3 6	0 00	8	8	Туре	- A - 9 - 4	
oscopist: oscope #: icle field area (mr r area (mm²): slide readable: meter #:	P = Personal; C = C		5						2020	Activity in Progress	Air Sampli	
<u>μ</u> 2):	learance	1753	1340	1321	1304	1252	1229	1211	1156	Start Time	ng Form	
		1403	1350	1331	1319	1302	1239	1221	1206	Stop		
Commen		2	S	15	15	51	15	1 S	15	LPM		
ts:		15	15	15	15	51	51	15	15	Stop		
C.		150	150	150	150	150	150	150	١٢٥	Volume	PD	
									SDIAL I	Fibers/	ate: os/	
										F/CC*	14(22 5f t	

	25 mm MCE 0.8 µg 25 mm MCE 0.45 µg 37 mm MCE	TEM-EPA Yamate NIOSH-7082/Pb Sample Media:	Analytical Method: PCM-Niosh 7400 TEM-AHERA	Type: OWA = Outside			2486 >	3436-	3436-	3436.	3436-	3436 -	3436-	3436-	3436- SAM 108	Sample Pump		Project Location:	Client: Project No :		ENVIRONMENTAL	AITA U	
riber/rields	Lab Blank Sample #	Field Blank Fiber/Fields	Alta On-site	Work Area; IWA = Inside Work Area; B = Ba			Bill, 600 ext Softer. (0)	p= boo/ bas ext NE (a)	1 600 NW (I)	4-1-2- (L)	0 600 Civ (1)	K- (if with	1-610/615 ext ~~ (0)	a lite extrine etc. (a)	A-2001200 6	Sample Location	MUIR SMASH ES	2526 6th St Sent Marie CA.	SAMUSO				
		Filter Q.C. s Rotor	Micro	ickground;			8	a	. ve	00	. 0		s un	a la	- JPC	Type							
		ble field area (mm area (mm²): slide readable: neter #:	scopist: scope #:	P = Personal; C = C			Y							2002	Progress	Activity in				Air Samplir			
		)?):		learance			1105	9501	1020	1007	550	0939	0927	4160	Time	Start				ng Form			
							1115	( 100	10%0	1017	1003	6460	6830	0924	Time	Stop							
Cert Num	On-Site T Signatur		Commen		T		5	51	15	15	51	15	51	51	Start	LPM							
iber:	echnician		<u>s</u> :			:	'n	5	15	15	51	15	15	51	Stop	PM							
	- 0. r							100	150	150	150	150	150	150	Volume		Pa	Da					
			Petection limit												Fields		ge: / o	te: 65/1					
			is 5.5 f/cc												F/CC*			5/22					







#### Muir ES notes by Oscar Garcia

The site consists of multiple two-story buildings of newer construction. All buildings are connected on the second floor via an open walkway. The walkway has a textured coating with drains that appear in good condition with some observed patchwork throughout.

Room 400, 500 and 600 has an outdoor deck on the second floor. In classroom 400, 500 and 600 it appears as if someone removed and replaced the drain piping.

Room 480 south entry has an expansion joint and door threshold that is loose and is allowing water intrusion when it rains. Room 415 is below and has some visible mold growth behind the dry erase board.

Room 510 has sandbags at south entry. Room 515 exterior SE end has a small hill that might cause water to accumulate around 510/515 south east entries. A drain is present and should be inspected. Aside from inspecting the drain someone should evaluate this area for water accumulation during heavy rain. On the south wall to exterior of room 515 there is a facia that is loose and bent and might cause water intrusion in the future. A one inch outside diameter hole is on the stucco wall that needs to be sealed.

Overall, the site stucco is in good condition. In various locations the stucco has some cracks and holes. In areas where the stucco meets the base or trim the stucco is cracked or chipped. Stucco trim door casings and window casings should be checked for proper seal.

The roof needs to be inspected by a roofing professional.

The newly installed AC units have penetrations through stucco without any caulking.

The rain gutters need to be inspected for clogs and if working properly.

At room 665 exterior southeast corner the facia wood support looks cracked and discolored. I suspect the rain gutter is clogged and might cause water intrusion in this location.

	V	5	1
ENVIR	ALTA	NTAL	
Client:	51	MM	USD

Page \_\_\_\_\_ of \_\_\_\_\_

Project Name: MUIR/SMASH E.S.

Alta Job No .: 54150-22-10989

TIME OF OBSERVATION	COMMENTS
	Room Zou
Drywall war/	needings #25 BZO CZS DZS
,	observed orifical barries installed covering
	HVAL wall deflars on south wall (vents/ diffue
	TWO Carnen A/LUNITS are in flis noon.
	Corrier A/L Units are on
	so suspect nold grow 14 observed
	small water stains observed at s/E side
	on wood Lech and sath water on metal
	septent beams
	Room 210 B
	media equipment room
	Readings DRyingel will
	A 20 B 20 C 20 D 20
	DID DOT observed any visible water stain
	non suspect mold grouth
	this 200m does not have a Carrie A/cuil
	Koom 205
	Communation Room.
	Drywull wall needing
	A20 B25 C30 D20
	observed water stain (small) on repland
	ZXY certing file at N/W side
	Did not observed supert mold growth
	Currice A/LUNITON.
	12m 665 DRywall wall reading)
	AZO BIS CIT DZS
	Did not observed any water stains over
	mold growth.
	Does not have a Carrier A/20411
	Alta Rep. Signature:
	Cert. Number: <u>68-4470</u>
	Date: 3/13/2022

N	V	5	1
ENVI	ALTA	NTAL	

Client: SMMUSD

Page \_\_\_\_ of \_\_\_\_

Project Name: MUIN/SMASH E.S.

Alta Job No .: 32130-22-10 789

TIME OF OBSERVATION	COMMENTS
	Room 660
	Drywall wall readings
	#25 B30 230 D30
	observed paint bulging on drywall window
	sill ou west side (largen, window)
	Did not observed any we ter stains
	won suggest word growth
	Carriel AL UNIT 64
	12004 665
	n 25 B 30 1 25 D 24
	Pullingt a hearing and a start mentil and the
	riding observed any suspect more group
	Querra All unit 64
	Room 600
	Drywall wall readings
	14 40 B 30 2 30 D 50
	did not observed any suspect mold growth
	Non wuter Train's
	Observed replaced black piping in side noon
	at nech kel coming from 2nd floor
	GUIDOON deck
	Corriel ATEUnil SE

Alta Rep. Signature:	-
Cert. Number: 08-4470	_
Date: 5/15/2022	

N	V	5	
		J	1
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Client: SMMUSD

Page <u>3</u> of <u>3</u>

Project Name: MUIN/SMASH ES.

Alta Job No.: 51450-22-10989

TIME OF OBSERVATION	COMMENTS
	Room 605
	Drywall will readings
	A 20 B 30 (30 D 30
	observed water stain on west are section
	of wood deck
	Reading on wood Leck support &
	Reading on wood Lich. 7
	did not observed any support reald growth
	Currier A/c unit off
	120014 615
	DRY wall wall readings
	24-30 B 30 L 30 D 30
	Observed water stain) on worth wast corner
	by entrance and at east center area
	on Deck wood supports (NOT ON DECK)
	Heading wood deck support 8
	wood deck t
	Dia not observer any support mole grous
	a price ale unit all
	Carrier ALCOULD off

Alta Rep. Signature:	2
Cert. Number: 08-4470	_
Date: 5/15/2021	_

Page /	of	21
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Project Name: MUNZ/SMASH E.S.

N|V|5

ALTA ENVIRONMENTAL

Client: <u>SMMUSD</u>

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\_\_\_\_\_ Alta Job No.: <u>SMSD-22-10989</u>

TIME OF OBSERVATION	COMMENTS
	Room 555 DW Background wall readings
	A 20 B 40 C 50 D 20
	Dict not observed any suspect mold anowath.
	von water stains
	CORRIGE A/CUNITON.
	Parmellit 120 -
	Pada 413 4 50 B 25 a 20 D 25
	realing hereasts since so the well and a find
	Proving with Stan on Dourg wail consisterior
	2/12 50
	Up lee L CD
	Bellet 90
	10 Feet 100+
	12 to by 5 feel section, improved at eraph
	south wall.
	observed wold growth behind dry-erase bound.
	plywood Luck on southern section is determined
	chack. 4ft X6 ft section.
	unter starning observed on north wall Lecking
	Reading on wood Leck. 10
	wood Lech support 9.
	worth wall reading at stained Lecking
	FROM TOS 10/30
	ft/madny 6/ 40
	5/ 30
•	Room 410 De wall readings
	A 30 B 30 C 20 D 20
-	South center Section of Deck. warten stoins
	observed: wood deck neading) Z feel from wall &
-	4 feel from wall 10
	200 11 Deallings from Top 20/30 +130 4/30
	DID NOI O BSOFUCOI CILL NIOIL Growth.

Alta Rep. Signature: Cert. Number: 5/14/2022 Date:\_\_\_\_



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Client: <u>SXIMVSD</u>

Page <u>2</u> of <u>1</u>

Project Name: MUPR/SMASH E-S

Alta Job No.: 54152-22-10985

TIME OF OBSERVATION	COMMENTS
/4	PM 515 A) 25 B) 20 c) 25 D) 20
	Observed drywall cusous on east wall at center
	Delow sinh and 5 about sing and on prodech
D	1 lost bourgette such Brad 1991 1) 90
Z	e)feet 2) 80
3)	7 feel 370
4	11 feet 4) 40
	water stains observed on electrical conclust any
	wood Section Peadings 9 merch.
	Lidnot observed any wold growth.
	Corrier ACoultoff.
	Room 500 ALARISCAD /211
	Didnet absorved and and arouth
	observed 6 peck dequall works.
-	appears to have replaced draining pipsing
	Carrier A/ anit off
-	Deck DW reading 40
	wood neading 9.
-	Rame ELT
	A = A $B = T (S(D) = T$
	Bargath sinh 30
	Did not observed any water stains
	non suspect mold grouth
(	Carrien AC 2nit off.
F	
ŀ	

	/
Alta Rep. Signature:	
Cert. Number: DE 4470	
Date: 5/14/2022	

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ENVIRO	NMENTAL
Client:	SMANUSD

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Page <u>3</u> of <u>4</u>

Project Name: MURE/ SMASH ES.

Alta Job No.: <u>57150-22-10</u>989

TIME OF OBSERVATION	COMMENTS
	Room 455 ARO B/30 C/SUD/25
	Observed bulging paint on west wall
	Did not observed any sispect reald growth
	NOTE: All sinks in all rooms with sinks
	have wood paneling which is a
	part of the sink cabined infront
	belind said plywood can not be test
	for humiclosy.
	Room 480
	420 B 30 C 20 D, 25
	Didnot observed any water stain)
	Corner All with off
	Room 100 A 20
	AB B20
	$D^2 D$
	Did not observed any atter stains
	The contraction of the second se

Alta Rep. Signature:	
Cert. Number: 68-4470	
Date: 5/14/2027	_



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Client: <u>SMMVSO</u>

Page <u>4</u> of <u>4</u>

Project Name: MVIN / SMASH E.S

Alta Job No.: <u>Sem 5 D-22-10989</u>

TIME OF OBSERVATION	COMMENTS
	Room 400 A 20 B 25 C 20 D 20
	Observed and for starning on south sile mechine
	Druggell deck no stains observed
	supports (wood) & fained pearling (8)
	Stanny observed on south wall, Drywall es
	lost monifed Dournall practice in monder
	arcais 30
	Did not observed any suspect wold growth
	water stained Reading at monoted area
	AppPer 10 SF 1) Steet from floor 20
	1 foot from floor 60
-	Comes Alcouit is on
	absenued Evilana part on pravil used west
	of west interim window, Approx (4 ST.)
-	Peadings at supertal and 4 feet frow JIR 50
	DIM not observed any suspect wold growth
-	
	Alta Rep. Signature:
	Date: $5/14/2027$