THE ENVIRONMENTAL SOLUTION



February 7, 2014

Mr. Michael Howard Clay Community Schools 1013 South Forest Avenue Brazil, Indiana 47834

### RE: INDOOR AIR QUALITY ASSESSMENT CLAY CITY JUNIOR/SENIOR HIGH SCHOOL, CLAY CITY, INDIANA ALLIANCE ENVIRONMENTAL GROUP PROJECT NUMBER NCL00101

Dear Mr. Howard:

Thank you for employing our professional indoor air quality program services at the above referenced site. We appreciate the opportunity to serve Clay Community Schools.

This report addresses indoor air quality (IAQ) conditions in rooms 104/105, 213, 212, 211, library, and band room.

# AIR SAMPLES

Non-viable air samples were taken in order to provide information regarding airborne particulates at the time of sampling. This type of inspection required the use of an air sampling pump equipped with aerodynamically designed Air-O-Cell cassettes in the in rooms 104/105, 213, 212, 211, library, band room, and one outdoors for comparison of ambient levels of fungi. The Air-O-Cell cassettes capture all airborne particulates, viable or non-viable, and allows for a rapid identification of fungal spores. These samples were collected for five minutes at a flow rate of 15 liters per minute. A total volume of 75 liters of air was collected. Samples were collected on January 30, 2014.

In general, the process for evaluating Air-O-Cell results is to compare indoor air samples with an outdoor air sample to determine ambient levels of fungi in the environment. If the total indoor spore count (in spores/m<sup>3</sup>) of fungi is less than the total ambient spores/m<sup>3</sup> outdoors, the air quality is acceptable with regards to non-viable fungi. Also, if the types of fungi identified indoors are at lower levels than the concentrations outdoors, the air quality is acceptable with regards to non-viable fungi.

The laboratory reported the presence of *Aspergillus/Penicillium* and Rust in the indoor samples which were not identified in the outdoor sample. Elevated levels are typically associated with a water intrusion event.

The results of the airborne fungi sampling are tabulated below.

Sample #	Location	Total Spores/m <sup>3</sup>	Fungi Exceeding Outdoor Levels	Fungi Not Found Outdoors
AOC-1	room 104/105	ND*		Aspergillus/Penicillium
AOC-2	room 213	70		Aspergillus/Penicillium
AOC-3	room 212	40		Aspergillus/Penicillium
AOC-4	room 211	60		Aspergillus/Penicillium Rust
AOC-5	library	80		Aspergillus/Penicillium
AOC-6	band room	310		Aspergillus/Penicillium
AOC-6	outside	1,480		

\* None Detected

*Aspergillus* is found in plant debris and soil. *Aspergillus* may cause allergic bronchopulmonary aspergillosis in individuals suffering from asthma and cystic fibrosis, and may cause sinusitis in some individuals.

*Penicillium* is a widespread fungus found in soil, decaying vegetation and air. *Penicillium* may cause infections in immunocompromised individuals, and can cause Type I ("hay fever") and Type III (hypersensitive) allergic reactions in susceptible individuals.

*Myxomycetes* is commonly found on decaying wood and vegetation. *Myxomycetes* is a Type I allergen which may cause reactions ("hay fever") in sensitive individuals.

Rust is a common plant pathogen. Rust is a type I allergen.

The presence of fungal spores at these levels is typical of the indoor environment. The presence of a single spore of *Aspergillus/Penicillium and* Rust is considered background level and is not significant.

#### SURFACE SAMPLES

No visible mold growth was oberved in any classrooms. However, water intrusion was either reported by teachers or observed in the band room and rooms 104/105, 213, 212, and 211. A surface sample was collected from each of these classrooms. The swab surface samples were collected using Healthlink Transporter sterile transport swabs.

The particles which adhere to the samplers are then evaluated for the presence of fungal spores, fruiting structures and other particulate matter. The laboratory reports the type of particles present on the slide (based on visual identification) and the relative particle frequency. The particle frequency is reported in four categories: rare (1 to 10), low (10 to 100), medium (101 to 1,000) and high (greater than 1,000).

Fungi present in the rare to low category, with no *Stachybotrys* present, are considered to be acceptable. The presence of hyphae or fruiting structures associated with specific spores is an indication of active fungal growth. The laboratory analysis of the swab sample is as follows:

Sample #	Sampling Location	Fungal Type	Category	Growth?
S-01	room 104/105 file cabinet	Alternaria Aspergillus/Penicillium	rare Iow	no no
S-02	room 213 top window	Cladosporium Epicoccum	rare rare	no no
S-03	room 212 window frame	Aspergillus/Penicillium Cladosporium	rare rare	no no
S-04	room 211 block window sill	Cladosporium	rare	no
TL-01	room 104/105	Aspergillus/Penicillium	rare	no
TL-02	band room	Aspergillus/Penicillium	high	no

## **GENERAL AIR QUALITY**

Data for general indoor air quality parameters [temperature, relative humidity, carbon dioxide  $(CO_2)$  and carbon monoxide (CO)], was acquired using an Alnor indoor air quality meter. General indoor air quality data is summarized in the following table:

Location	Temp (°F)	RH (%)	CO₂ (ppm)	CO (ppm)
room 104/105	70.2	22.5	1030	0.8
room 213	69.3	16.0	709	0.9
room 212	71.9	12.1	556	0.8
room 211	70.5	11.6	593	0.7
library	73.4	11.7	561	0.9
band room	71.9	13.9	605	0.9
outside	37.3	20.5	404	0.7
regulatory limits	68 - 78	less than 65	less than outside + 700	less than 50

The temperature, relative humidity and carbon dioxide levels recorded in the classrooms were within the requirements of 410 IAC 33. Carbon monoxide was below the OSHA permissable exposure limit.

#### RECOMMENDATIONS

Based on the results of laboratory analysis and conditions observed in the school, Alliance recommends the following:

- 1. The carpet and mastic in the band room should be removed. The concrete floor should be dried. Once complete new carpet can be applied. The water intrusion from the exterior door needs to be addressed prior to the completion of the carpet replacement.
- 2. Although no issues were observed or reported by the laboratory in room 104/105, based on the discussions with the teachers in that room, water intrusion does occur. If water intrusions continue mold growth is likely to occur.

Thank you for the opportunity to assist you with indoor air quality needs.

Sincerely,

Alliance Environmental Group

Jeffrey Rechtin Project Manager

Attachments

	EMS	L Analyti	ical, Inc.				Or	der ID:	1614012	98
	<b>15L</b> 2001 Ea	ast 52nd St.	Indianapolis, IN	46205			Cu	istomer ID:	ALLI65	
			3-2997 / (317) 8					istomer PO:		
			m / indianapolis		.com		Pro	oject ID:		
Attn:	Jeff Rechtin				 Pł	none:	(317) 865-3	3400		$ \longrightarrow$
	Alliance Environm	ental Group.	Inc.			ax:	(317) 865-			
	5340 Commerce (				Co	ollected:	01/30/2014			
	Suite E				Re	eceived:	01/31/2014	4		
	Indianapolis, IN 4	6237			Ar	nalyzed:	01/31/2014	1		
Proj:	NCL00I01									
	Test Report: Air-C	O-Cell(™) Ana	lysis of Fungal S	Spores & Pa	rticulates by C	ptical Microsc	opy (Methods	SEMSL 05-TP-	003, ASTM D73	91)
	Lab Sample Number:		161401298-0001			161401298-0002		-	161401298-0003	
	Client Sample ID: Volume (L):		AOC-1 75			AOC-2 75			AOC-3 75	
	Sample Location:		Room 104/105			Rm 213			Rm 212	
	Spore Types	Raw Count	Count/m <sup>3</sup>	% of Total	Raw Count	Count/m <sup>3</sup>	% of Total	Raw Count	Count/m <sup>3</sup>	% of Total
	Alternaria	-	-	-	1*	10*	14.3	-	-	-
	Ascospores	-	-	-	-	-	-	-	-	-
As	spergillus/Penicillium	-	-	-	1*	10*	14.3	-	-	-
	Basidiospores	-	-	-	-	-	-	-	-	-
	Bipolaris++	-	-	-	-	-	-	-	-	-
	Chaetomium	-	-	-	-	-	-	-	- 40	- 100
	Cladosporium Curvularia	-	-	-	-	-	-	-	40	-
	Epicoccum	-	_	-	-	-	_	-	-	-
	Fusarium	-	-	-	_	-	-	-	-	-
	Ganoderma	-	-	-	-	-	-	-	-	-
	Myxomycetes++	-	-	-	1	40	57.1	-	-	-
	Pithomyces	-	-	-	-	-	-	-	-	-
	Rust	-	-	-	-	-	-	-	-	-
	Scopulariopsis	-	-	-	-	-	-	-	-	-
	Stachybotrys	-	-	-	-	-	-	-	-	-
	Torula	-	-	-	-	-	-	-	-	-
	Ulocladium	-	-	-	-	-	-	-	-	-
U	Inidentifiable Spores	-	-	-	1*	10*	14.3	-	-	-
	Zygomycetes	-	-	-	-	-	-	-	-	-
	Total Fungi Hyphal Fragment	-	None Detected	-	4	70	100	1 1*	<b>40</b> 10*	<b>100</b> 25
	Insect Fragment	_	-	-	-	-	_	-	-	-
	Pollen	-	-	-	-	-	-	-	-	-
Ana	alyt. Sensitivity 600x	-	42	-	-	42	-	-	42	-
	alyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
	Skin Fragments (1-4)	-	1	-	-	1	-	-	1	-
Fibr	ous Particulate (1-4)	-	1	-	-	1	-	-	1	-
	Background (1-5)	-	1	-	-	1	-	-	1	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum Myxomycetes++ = Myxomycetes/Periconia/Smut

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

rooke

Andrea Brooke, Microbiology Lab Manager or Other Approved Signatory

High levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "\*" Denotes particles found at 300X. "." Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Indianapolis, IN AIHA-LAP, LLC--EMLAP 157245

Initial report from: 01/31/2014 14:59:31

For Information on the fungi listed in this report please visit the Resources section at www.emsl.com Test Report SPVER3-7.30.1 Printed: 1/31/2014 05:44:53PM

	EMS	L Analyti	cal, Inc.				Or	der ID:	1614012	98
EN	<b>1SL</b> 2001 Ea	ast 52nd St. I	ndianapolis, IN	46205			Cu	stomer ID:	ALLI65	
			3-2997 / (317)				Cu	stomer PO:		
			<u>m</u> / <u>indianapoli</u>		.com		Pro	oject ID:		
										$ \longrightarrow$
Attn:	Jeff Rechtin		1			none: ax:	(317) 865-			
	Alliance Environm 5340 Commerce (	-	INC.			ollected:	(317) 865- 01/30/2014			
	Suite E	JICIE				eceived:	01/31/2014			
	Indianapolis, IN 4	6237				nalyzed:	01/31/2014			
Proj:	NCL00I01	0201			, .	1017200	0 // 0 // 20 /	•		
	Test Report: Air-0	Coll(™) Ana	veis of Fundal	Spores & Pa	rticulatos by (	ntical Microsc	onv (Mothoda			91)
	Lab Sample Number:		161401298-0004	spores & Fa	-	161401298-0005			161401298-0006	51)
	Client Sample ID:		AOC-4			AOC-5			AOC-6	
	Volume (L):		75			75			75	
	Sample Location:		Rm 211			Library			Band Room	
	Spore Types	Raw Count	Count/m <sup>3</sup>	% of Total	Raw Count	Count/m <sup>3</sup>	% of Total	Raw Count	Count/m <sup>3</sup>	% of Total
	Alternaria Ascospores	-	-	-	- 1	- 40	- 50	-	-	-
As	pergillus/Penicillium	- 1	40	66.7	1	40	50	6	300	96.8
7.3	Basidiospores	-	-	-	-	-	-	-	-	-
	Bipolaris++	-	-	-	-	-	-	-	-	-
	Chaetomium	-	-	-	-	-	-	-	-	-
	Cladosporium	1*	10*	16.7	-	-	-	1*	10*	3.2
	Curvularia	-	-	-	-	-	-	-	-	-
	Epicoccum	-	-	-	-	-	-	-	-	-
	Fusarium	-	-	-	-	-	-	-	-	-
	Ganoderma	-	-	-	-	-	-	-	-	-
	Myxomycetes++	-	-	-	-	-	-	-	-	-
	Pithomyces	- 1*	- 10*	- 16.7	-	-	-	-	-	-
	Rust Scopulariopsis	-	īŪ	-	-	-	-	-	-	-
	Stachybotrys	-	-	-	_	-	-	_	-	-
	Torula	-	-	-	-	-	-	-	-	-
	Ulocladium	-	-	-	-	-	-	-	-	-
U	nidentifiable Spores	-	-	-	-	-	-	-	-	-
	Zygomycetes	-	-	-	-	-	-	-	-	-
	Total Fungi	3	60	100	2	80	100	7	310	100
	Hyphal Fragment	-	-	-	-	-	-	1	40	12.9
	Insect Fragment	-	-	-	-	-	-	-	-	-
	Pollen	-	-	-	-	-	-	-	-	-
	alyt. Sensitivity 600x	-	42	-	-	42	-	-	42	-
	alyt. Sensitivity 300x kin Fragments (1-4)	-	13* 1	-	-	13* 1	-	-	13* 2	-
	bus Particulate (1-4)	-	1	_	_	1	_	_	1	_
	Background (1-5)	-	1	-	-	1	-	-	2	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum Myxomycetes++ = Myxomycetes/Periconia/Smut

rooke

Andrea Brooke, Microbiology Lab Manager or Other Approved Signatory

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

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Samples analyzed by EMSL Analytical, Inc. Indianapolis, IN AIHA-LAP, LLC--EMLAP 157245

Initial report from: 01/31/2014 14:59:31

For Information on the fungi listed in this report please visit the Resources section at www.emsl.com Test Report SPVER3-7.30.1 Printed: 1/31/2014 05:44:53PM

Sample NumberPump I.D.Sample LocationStart StartStop StartAOC-1bio <i>Km</i> locl/loS31532AOC-3BTO <i>Rm</i> 21333534AOC-3BTO <i>Rm</i> 213336341AOC-3BTO <i>Rm</i> 21333540AOC-3BTO <i>Rm</i> 21333540AOC-3BTO <i>Rm</i> 21333540AOC-3BTO <i>Rm</i> 21335641AOC-3BTO <i>Rm</i> 21335540AOC-1BTO <i>Rm</i> 21335540AOC-1BTO <i>Rm</i> 2134747AOC-1BTO <i>Rm</i> 2114747AOC-16BTO <i>Rm</i> 2114747AOC-16BTO <i>Rm</i> 21045950AOC-16BTO <i>Rn</i> 0 <i>Robin</i> 459AOC-16BTO <i>Rn</i> 0 <i>Robin</i> 459ADO <i>Rn</i> 0 <i>Robin</i> 459ADO <i>Rn</i> 0 <i>Robin</i> 459ADO <i>RobinRobin</i> 459ADO <i>Robin</i>		
hio Km loul/los 315 BED Rm 213 336 BED Rm 213 336 BED Rm 211 417 BED Rm 211 417	Start Stop   Iotal   Start   Stop   Avg.   LIUEIS	Colonies CFU /M <sup>3</sup>
BED RM213 330 BED RM213 335 BED RM211 417 BED RM211 417 BED Library 437 BED RAND ROOM 459	320 5 BIO 45	5
BEFO RM 2/2 355 BEFO RM 2/1 4/7 BEFO Library 4/57 BEFO RODM 4/59	341 5 BILO 75	
BERO RIM 211 417 BERO LIBLARY 437 BERO BAND ROOM 459 BEND ROOM 459	400 5 BIO 75	
BEO Library 437 BEN BRN BOOM 459 159	452 STO 25	
BAND Room 459	4425 Bio 75	
	50 5 5IO 75	
CHAIN OF CUSTODY   CHAIN OF CUSTODY   SAMPLE BY: Jeff Rowhin   DATE: Joyl4	PRORDED BY: DATE: DATE: SIGNATURE: SHIPPED TO:	LOG#:

E	MSL	EMSL Analytical, Inc. 2001 East 52nd St. Indianapolis, IN 46205 Phone/Fax: (317) 803-2997 / (317) 803-3047 http://www.EMSL.com / indianapolislab@emsl.com		Order ID: Customer ID: Customer PO: Project ID:	161401298 ALLI65
Attn:	Jeff Rech		Phone:	(317) 865-3400	
	Alliance E	Environmental Group, Inc.	Fax:	(317) 865-3401	
	5340 Cor	nmerce Circle	Collected:	01/30/2014	
	Suite E		Received:	01/31/2014	
	Indianapo	blis, IN 46237	Analyzed:	01/31/2014	
Proi:	NCL00I0	1			

#### Test Report: Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and Other Particulates from Swab Samples (EMSL Method: M041)

Lab Sample Number	Client Sample ID	Location	Fungal Identification	Category
161401298-0007	S-01	Rm 104-105 File Cabinet	Alternaria	Rare
			Aspergillus/Penicillium	Low
			Fibrous Particulate	Low
			Hyphal Fragment	Rare
161401298-0008	S-02	Rm 213 Top Window	Cladosporium	Rare
			Epicoccum	Rare
			Fibrous Particulate	Rare
161401298-0009	S-03	Rm 212 Window Frame	Aspergillus/Penicillium	Rare
			Cladosporium	Rare
			Fibrous Particulate	Rare
161401298-0010	S-04	Rm 211 Block Window Sill	Cladosporium	Rare
			Fibrous Particulate	Rare

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

* = Sample contair	ns fruiting structures and/or hyphae a	, ,	
Category	Count/area Analyzed	tudrea	Brooke
Rare Low Medium High	1 to 10 11 to 100 101 to 1000 > 1000		robiology Lab Manager roved Signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation of the data contained in this report is the responsibility of the client. \*-\* denotes not detected. Samples received in good condition unless otherwise noted.

AIHA-LAP, LLC--EMLAP Accredited #157245

#### Initial report from: 01/31/2014 14:48:56

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

Bipolaris++ = Bipolaris/Dreschlera/Exserohilum Myxomycetes++ = Myxomycetes/Periconia/Smut

		EMSL Analytical	, Inc.		Order ID:	161401298
	MSL	2001 East 52nd St. Indiar Phone/Fax: (317) 803-299 http://www.EMSL.com / in	97 / (317) 803-3047	<u>om</u>	Customer ID: Customer PO: Project ID:	ALLI65
Attn:	5340 Con Suite E	tin invironmental Group, Inc. imerce Circle lis, IN 46237		Phone: Fax: Collected: Received: Analyzed:	(317) 865-3400 (317) 865-3401 01/30/2014 01/31/2014 01/31/2014	
Proj:	NCL00101					
		Test Report: Microso	copic Examination of I Particulates from Tap	• •	gal Structures, Hyphae, an Method: M041)	d Other
	b Sample Number	Client Sample ID	Location	F	ungal Identification	Category

Number		Location	i ungai identification	Outegoly
161401298-0011	TL-01	Rm 104-105 Floor	Aspergillus/Penicillium	Rare
			Fibrous Particulate	Low
			Hyphal Fragment	Low
			Insect Fragment	Low
161401298-0012	TL-02	Band Room	Aspergillus/Penicillium	High
			Fibrous Particulate	Low
			Hyphal Fragment	Low
			Insect Fragment	Low

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

Bipolaris++ = Bipolaris/Dreschlera/Exserohilum Myxomycetes++ = Myxomycetes/Periconia/Smut * = Sample contains fruiting structures and/or hyphae associated with the spores.			]	
Category	Count/area Analyzed		Indrea	5 Brooke
Rare Low Medium High	1 to 10 11 to 100 101 to 1000 > 1000			bbiology Lab Manager oved Signatory
	mple collection activities or analytical method	lates only to the samples reported above and may not be reproduced, e limitations. Interpretation of the data contained in this report is the resp		

AIHA-LAP, LLC--EMLAP Accredited #157245

#### (Initial report from: 01/31/2014 14:48:56)

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

401298

# CHAIN OF CUSTODY RECORD

ALLIANCE ENVIRONMENTAL GROUP, INC.	
5340 Commerce Circle, Suite E	
Indianapolis, IN 46237	
317-865-3400 • Fax 317-865-3401	
Project Name Clay Community Schools	
Project Location Clay City H.S.	
Project # NCLOUIDI 0 Date 1/30/14	
SAMPLE LOCATION OF SAMPLE DESCRIPTION OF SAMPLE MATERIAL	
3-01 Rm 104/105 File CAblet SWAB	
5-02 Rmais Top window SWAB	
5-03 Kmall window Frame SWAB	
5-04 Rm211 Blockwindowsill SWAB	
TL-01 Rm104/105 Floor TAPELift	
TZ-02 BAND Room TAPE Lift.	
Analysis Direct Read Turn-around Time 24hr	
Comments	
Teff Dechtia Das Res	
Sample by <u>left Kechtin</u> Received by <u>lop Boo</u> Recorded by(Print) (Print)	
1111 Aller	
Signature Signature Signature Signature	
Date 13019 Date 1-31-19 840 Date	