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# **INDOOR AIR QUALITY EVALUATION REPORT**

# Annual Assessment

Columbia High School 17 Parker Avenue Maplewood, NJ 07040

Prepared for

South Orange/Maplewood School District 525 Academy Street Maplewood, NJ 07040 Attn: Mr. Thomas Giglio

> Survey dates: Inspection performed by:

03/14/2022 Mr. Eric Clarkson

PO Box 385

AHERA Consultants Inc. was retained by the South Orange / Maplewood School District to conduct an annual indoor air quality (IAQ) assessment at the Columbia High School located in Maplewood, New Jersey. This assessment was performed at the request of Mr. Thomas Giglio, Facilities Director with the South Orange Maplewood School District.

### **Section II**

## **Physical Inspection**

Sampling Procedures

**Testing Results** 

March 11, 2022

Introduction

# **Existing Conditions**

On March 14, 2022, I Eric Clarkson of AHERA Consultants, Inc. arrived at the Columbia High School. The custodial staff provided access to various areas within the building.

Testing and visual inspection of random areas was performed. HVAC systems within this facility consist of boilers, radiators, unit ventilators and window air conditioning units. Periodic maintenance is performed on the system.

Based on my observations I determined that ambient air sampling to assess current air quality conditions with respect to temperature, humidity, carbon dioxide CO2, carbon monoxide CO, mold screening and airborne asbestos in random locations inside the building would be appropriate.

Section III

- Indoor air quality measurements for temperature, humidity, CO<sup>2</sup> and CO were taken utilizing a Model 7545 IAQ-Calc Indoor Air Quality Meter. (See IAQ Investigation Logs provided within this report)
- Asbestos air sampling was conducted utilizing TEM sampling media and a high-volume air sampling pump calibrated to 10 LPM. Testing was conducted in the 1<sup>st</sup> floor hallway.
- Air sampling for airborne fungal bioaerosols was performed utilizing Air-O-Cell Cassettes. 150 liters of air was drawn through each sample. The sampling media was submitted to EMSL Analytical Laboratories in Piscataway, NJ for analysis. Air samples were analyzed within a 72-hour turnaround period.

#### **Section IV**

 $\Diamond$ 

Air-O-Cell Sampling Results

ANALYSIS OF FUNGAL SPORES & PARTICULATES BY OPTICAL MICROSCOPY: AIR-O-CELL Cassette

SAMPLE ID #	SAMPLE LOCATION	PARTICLE ID	COUNT/ m3
		Ascospores	20
	Main Entrance Hellurer	Basidiospores	200
CHS-01	Main Entrance Hallway	Cladosporium	100
		Total Fungi	320
	Outdoor Control Sample	Ascospores	220
		Aspergillus/Penicillium	70
CU C 02		Basidiospores	900
CHS-02		Cladosporium	100
		Fusarium	20
		Total Fungi	1310

**Results:** Concentrations of indoor fungal spores were comparable to and less than the outdoor control sample. No visible active mold growth was observed at the time of this assessment.



#### Asbestos Air Sampling Results

March 11, 2022

SAMPLE ID #	SAMPLE LOCATION	Asbestos Type(s)	Asbestos Concentration (S/CC <sup>2</sup> )
CES-01	1 <sup>st</sup> floor hallway	None Detected	<.0044

Asbestos Fiber Analysis by Transmission Electron Microscopy (TEM)

Results: Sample was "none detected" for asbestos structures.

Section V Interpretation	ion of Results
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At this time there are no governmental standards regarding Indoor Air Quality. The Occupational Safety and Health Association (OSHA) and the National Institute of Occupational Safety and Health (NIOSH), as well as other occupational health related associations, have not established permissible exposure levels (PELs), recommended exposure limits (RELs), or other limit values for aeroallergens. (See EMSL Expanded Fungal Report) provided herein.

Most of the fungi detected in typical indoor investigations are considered common to both indoor and outdoor environments. These include species that belong to the genera Cladosporium, Aspergillus, Penicillium, Alternaria, Basidiospores and others. False negative and false positive data are possible. However, it is generally accepted in the "indoor air quality" industry that indoor fungal growth is undesirable and may necessitate removal or other appropriate remedial actions.

No remedial project should be based solely on data obtained from culturable fungal bioaerosols to represent a threshold value having a medical or health significance with respect to exposure, nor is it necessarily representative of an unacceptable indoor environment. Rather, it is intended to be a "reactionary threshold" to incite further investigation as to the cause(s) of what is considered to be an above average concentration for culturable indoor bioaerosols.

Under the Public Employees Occupational Safety and Health Program there is currently an indoor air quality standard for the state of New Jersey (NJAC 12:100-13). Additionally, there are recommendations under ASHRAE "The American Society of Heating, Refrigeration, and Air Conditioning Engineers for the Indoor Environment.

Under NJAC 12:100-13 a range of 68 to 79 degrees Fahrenheit is the desired temperature range to maintain with Carbon Dioxide (CO<sup>2</sup>) not exceeding 1000 ppm. If Carbon Dioxide (CO<sup>2</sup>) exceeds 1000 PPM the HVAC system should be evaluated for proper operation.

ASHRAE recommends that a relative humidity between 30% and 60% are acceptable, readings in excess of 70% is considered a friendly environment to microorganisms such as mold.

Carbon Monoxide (CO) levels based on OSHA limits long-term workplace exposure levels to 50 ppm over an 8-hour time weighted average. The Threshold Limit Value or TLV for carbon monoxide is 25 ppm.



Section VI	Observations/Recommended Response Actions
Observations:	Results of the air testing conducted during this assessment did not indicate abnormal or exceptional concentrations of airborne fungal bioaerosols at the time of testing. Relative humidity (RH) throughout the building was below the recommended 30% at the time of testing indicating dry conditions. The temperature, carbon dioxide and carbon monoxide levels were all within acceptable ranges.
	Sampling results for airborne asbestos fibers were none detected.
Recommendations:	Continue to monitor relative humidity (RH) within the building during different times of the year. RH is typically lower during the winter months due to the heating season. Maintain temperatures between the desired range of 68 and 79 degrees.
	To prevent creating environments that would promote mold proliferation all sources of excessive moisture/water infiltration should be identified, controlled and/or eliminated when/if they occur.
	Finally, increasing fresh air exchanges within interior spaces should help ameliorate and/or maintain acceptable indoor air quality. Proper cleaning procedures will help eliminate dirt/dust & fungal spore accumulations as well.
	Maintain all asbestos containing materials in an intact condition and do not disturb.

## ATTACHMENTS:

IAQ Investigation Logs - (4 Pages) Asbestos Fiber Analysis Report (1 Page) EMSL Expanded Fungal Assessment Report - (14 Pages)

#### Columbia High School 17 Parker Avenue Maplewood, NJ 07040

		IAQ Invest	igation Log
Test ID:	Columb	ia High School	
Model Number:	IAQ Calc 7545		
Serial Number:	T75451321002		
Test ID:	45		
Test Abbreviation:	Test 045		
Start Date:	3/14/2022		
Start Time:	19:44:02		
Duration (dd:hh:mm:ss):	0:00:02:23		
Log Interval (mm:ss):	0:05		
Number of points:	5		
Notes:	Test 045		

#### **1st Floor Hallway**



istics	Channel:	CO2 - Carbon Dioxide	T - Temperature	H - Humidity	CO - Carbon Monoxide
	Units:	ppm	deg F	%rh	ppm
	Average:	501	72.9	19.7	5.5
	Minimum:	497	72.2	19.1	5.4
	Time of Minimum:	19:44:07	19:44:07	19:46:25	19:45:07
	Date of Minimum:	3/14/2022	3/14/2022	3/14/2022	3/14/2022
	Maximum:	505	73.4	20.6	5.5
	Time of Maximum:	19:45:37	19:44:47	19:44:07	19:44:47
	Date of Maximum:	3/14/2022	3/14/2022	3/14/2022	3/14/2022

Calibration	Meter:	6/2/2021			
Calibration	Sensor:	CO2 - Carbon Dioxide	T-Temperature	H-Humidity	CO - Carbon Monoxide
	Cal. Date	6/2/2021	6/2/2021	6/2/2021	6/2/2021

Date	Time	CO2 - Carbon Dioxide	T-Temperature	H-Humidity	CO - Carbon Monoxide
MM/DD/YYYY	hh:mm:ss	ppm	deg F	%rh	ppm
3/14/2022	19:44:07	497	72.2	20.6	5.4
3/14/2022	19:44:47	499	73.4	19.8	5.5
3/14/2022	19:45:07	500	73.4	19.5	5.4
3/14/2022	19:45:37	505	73	19.6	5.4
3/14/2022	19:46:25	503	72.4	19.1	5.4

#### Columbia High School 17 Parker Avenue Maplewood, NJ 07040

		IAQ Invest	igation Log
Test ID:	Columb	ia High School	
Model Number:	IAQ Calc 7545		
Serial Number:	T75451321002		
Test ID:	46		
Test Abbreviation:	Test 046		
Start Date:	3/14/2022		
Start Time:	19:47:42		
Duration (dd:hh:mm:ss):	0:00:02:27		
Log Interval (mm:ss):	0:05		
Number of points:	5		
Notes:	Test 046		

#### 2nd Floor Hallway



atistics	Channel:	CO2 - Carbon Dioxide	T - Temperature	H - Humidity	CO - Carbon Monoxide
	Units:	ppm	deg F	%rh	ppm
	Average:	623	72.5	20.9	5.1
	Minimum:	581	72	19.5	4.9
	Time of Minimum:	19:49:23	19:47:47	19:49:23	19:50:09
	Date of Minimum:	3/14/2022	3/14/2022	3/14/2022	3/14/2022
	Maximum:	664	72.7	21.9	5.4
	Time of Maximum:	19:48:55	19:49:23	19:48:55	19:47:47
	Date of Maximum:	3/14/2022	3/14/2022	3/14/2022	3/14/2022

Calibration	Meter:	6/2/2021			
Calibration	Sensor:	CO2 - Carbon Dioxide	T-Temperature	H-Humidity	CO - Carbon Monoxide
	Cal. Date	6/2/2021	6/2/2021	6/2/2021	6/2/2021

Date	Time	CO2 - Carbon Dioxide	T-Temperature	H-Humidity	CO - Carbon Monoxide
MM/DD/YYYY	hh:mm:ss	ppm	deg F	%rh	ppm
3/14/2022	19:47:47	631	72	21.3	5.4
3/14/2022	19:48:22	659	72.3	21.8	5
3/14/2022	19:48:55	664	72.7	21.9	4.9
3/14/2022	19:49:23	581	72.7	19.5	5
3/14/2022	19:50:09	583	72.7	20	4.9

#### Columbia High School 17 Parker Avenue Maplewood, NJ 07040

			IAQ Investigation I	.og
Test ID:		Columbia High School		
Model Number:	IAQ Calc 7545			
Serial Number:	T75451321002			
Test ID:	47			
Test Abbreviation:	Test 047			
Start Date:	3/14/2022			
Start Time:	19:51:47			
Duration (dd:hh:mm:ss):	0:00:02:33			
Log Interval (mm:ss):	0:05			
Number of points:	5			
Notes:	Test 047			





tistics	Channel:	CO2 - Carbon Dioxide	T - Temperature	H - Humidity	CO - Carbon Monoxide
	Units:	ppm	deg F	%rh	ppm
	Average:	513	72.1	20.4	5
	Minimum:	508	71.5	20	4.8
	Time of Minimum:	19:53:09	19:54:20	19:54:20	19:53:09
	Date of Minimum:	3/14/2022	3/14/2022	3/14/2022	3/14/2022
	Maximum:	522	72.6	20.7	5.1
	Time of Maximum:	19:53:51	19:53:09	19:52:17	19:54:20
	Date of Maximum:	3/14/2022	3/14/2022	3/14/2022	3/14/2022

Calibration	Meter:	6/2/2021			
Calibration	Sensor:	CO2 - Carbon Dioxide	T-Temperature	H-Humidity	CO - Carbon Monoxide
	Cal. Date	6/2/2021	6/2/2021	6/2/2021	6/2/2021

Date	Time	CO2 - Carbon Dioxide	T-Temperature	H-Humidity	CO - Carbon Monoxide
MM/DD/YYYY	hh:mm:ss	ppm	deg F	%rh	ppm
3/14/2022	19:51:52	515	72.1	20.3	5
3/14/2022	19:52:17	509	72.4	20.7	4.9
3/14/2022	19:53:09	508	72.6	20.5	4.8
3/14/2022	19:53:51	522	71.8	20.6	5
3/14/2022	19:54:20	511	71.5	20	5.1

#### Columbia High School 17 Parker Avenue Maplewood, NJ 07040

		IAQ Invest	igation Log		
Test ID:	Columb	Columbia High School			
Model Number:	IAQ Calc 7545				
Serial Number:	T75451321002				
Test ID:	48				
Test Abbreviation:	Test 048				
Start Date:	3/14/2022				
Start Time:	21:02:17				
Duration (dd:hh:mm:ss):	0:00:01:05				
Log Interval (mm:ss):	0:05				
Number of points:	5				
Notes:	Test 048				

#### **Outdoor Control Sample**



tistics	Channel:	CO2 - Carbon Dioxide	T - Temperature	H - Humidity	CO - Carbon Monoxide
	Units:	ppm	deg F	%rh	ppm
	Average:	523	55	27.5	8.1
	Minimum:	499	52.4	25.2	6.4
	Time of Minimum:	21:03:22	21:03:22	21:02:22	21:03:22
	Date of Minimum:	3/14/2022	3/14/2022	3/14/2022	3/14/2022
	Maximum:	552	56.9	30.4	10
	Time of Maximum:	21:02:22	21:02:22	21:03:22	21:02:22
	Date of Maximum:	3/14/2022	3/14/2022	3/14/2022	3/14/2022

Calibration	Meter:	6/2/2021			
Calibration	Sensor:	CO2 - Carbon Dioxide	T-Temperature	H-Humidity	CO - Carbon Monoxide
	Cal. Date	6/2/2021	6/2/2021	6/2/2021	6/2/2021

Date	Time	CO2 - Carbon Dioxide	T-Temperature	H-Humidity	CO - Carbon Monoxide
MM/DD/YYYY	hh:mm:ss	ppm	deg F	%rh	ppm
3/14/2022	21:02:22	552	56.9	25.2	10
3/14/2022	21:02:31	537	56	26.3	9.1
3/14/2022	21:02:47	509	55.9	27.5	7.9
3/14/2022	21:02:57	518	53.7	28.1	7.3
3/14/2022	21:03:22	499	52.4	30.4	6.4

EMSL	EMSL Analytical, Inc. 1056 Stelton Road Piscataway, NJ 08854 Tel/Fax: (732) 981-0550 / (732) 981-0551 http://www.EMSL.com / piscatawaylab@emsl.com	EMSL Order: Customer ID: Customer PO: Project ID:	
Attention:	Ahera Consultants, INC	Phone:	(609) 652-1833
	Ahera Consultants, Inc.	Fax:	(609) 652-1140
	PO Box 385	Received Date:	03/15/2022 09:00 AM
	Oceanville, NJ 08231-0385	Analysis Date:	03/17/2022
		Collected Date:	03/14/2022
Project:	22-6032 / Columbia High School, 17 Parker Avenue, Maplewood,	NJ 07040	

## Test Report: Asbestos Fiber Analysis by Transmission Electron Microscopy (TEM) Performed by EPA 40 CFR Part 763 Appendix A to Subpart E

	Area Volume Analyzed Non Asbestos #Stri				#Structu	res	Analytical Sensitivity	Asbestos Concentration		
Sample	Location	(Liters)	(mm²)	Asb	Type(s)	≥0.5µ < 5µ	≥5µ	(S/cc)	(S/mm²)	(S/cc)
CHS-01	1st Floor Hallway	1350.00	0.0645	0	None Detected	0	0	0.0044	<16.00	<0.0044
052201044-0001										

Analyst(s)

Colin Slattery (1)

CN

Chaiyut Sae Lao, Laboratory Manager or other approved signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. 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. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. Results reported in structures/cm3 are not covered by the laboratory's NVLAP accreditation. Measurement of uncertainty available upon request.

Samples analyzed by EMSL Analytical, Inc. Piscataway, NJ NYS ELAP 11423, NVLAP Lab Code 101048-2, NJ NELAC 12037, Philadelphia 289, CT PH-0266

Initial report from: 03/18/2022 07:33 AM

ASB\_TEMAHERA\_0004\_0001 Printed: 3/18/2022 7:33:43AM





# EXPANDED FUNGAL ASSESSMENT REPORT ™

#### **Prepared Exclusively For**

AHERA Consultants, Inc.

PO Box 385 Oceanville, NJ 08231-0385 Phone:609-652-1833

Report Date: Project:

EMSL Order:

3/19/2022 22-6032 / South Orange / Maplewood School District, Columbia High School, 17 Parker Avenue, Maplewood, NJ 07040 052201037

AIHA LAP, LLC.

EMLAP #167035



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Attn:	AHERA C	onsultants, INC	EMSL Order:	052201037				
	AHERA Consultants, Inc. PO Box 385		Customer ID:	AHER50				
			Collected:	3/14/2022				
	Oceanville	e, NJ 08231-0385	Received:	3/15/2022				
			Analyzed:	3/16/2022				
Proj:	22-6032 /	South Orange / Maplewood School District,	Columbia High School,	17 Parker Avenue, Maplewood, NJ 07040				

#### 1. Description of Analysis

#### Analytical Laboratory

EMSL Analytical, Inc. (EMSL) is a nationwide, full service, analytical testing laboratory network providing Asbestos, Mold, Indoor Air Quality, Microbiological, Environmental, Chemical, Forensic, Materials, Industrial Hygiene and Mechanical Testing services since 1981. Ranked as the premier independently owned environmental testing laboratory in the nation, EMSL puts analytical quality as its top priority. This quality is recognized by many well-respected federal, state and private accrediting agencies, and assured by our high-quality personnel, including many Ph.D. microbiologists and mycologists.

EMSL is an independent laboratory that performed the analysis of these samples. EMSL did not conduct the sampling or site investigation for this report. The samples referenced herein were analyzed under strict quality control procedures using state-of-the-art microbiological methods. The analytical methods used and the data presented are scientifically and legally defensible.

The laboratory data is provided in compliance with ISO-IEC 17025 guidelines for the particular test(s) requested, including any associated limitations for the methods employed. These data are intended for use by professionals having knowledge of the testing methods necessary to interpret them accurately.

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		EMSL Analytical, Inc.							
		6 Stelton Road I ne: (732) 981-0550	Piscataway, NJ 08854 Fax: (732) 981-0551	Web: http://www.EMSL.	com	Email:piscatawaylab@emsl.com			
Attn:	AHERA Consu	Itants, INC		EMSL Order:	05220	1037			
	AHERA Consu	AHERA Consultants, Inc. PO Box 385			AHER	50			
	PO Box 385				3/14/2	022			
	Oceanville, NJ 08231-0385		Received:	3/15/2	022				
			Analyzed:	3/16/2	022				
Proj:	22-6032 / Sout	h Orange / Maple	ewood School District, Co	lumbia High School,	17 Pai	rker Avenue, Maplewood, NJ 07040			

#### Air Samples - Spore traps:

Spore traps are commercially available sampling devices that capture airborne particles on an adhesive slide. Air is pulled through the device using a vacuum pump. Spores, as well as other airborne particles, are impacted on the collection adhesive. Using spore trap collection methods has inherent limitations. These collection methods are biased towards larger spore sizes.

The analysis for total spore counts is a direct microscopic examination and does not include culturing or growing the fungi. Therefore, the results include both viable and non-viable spores. Some fungal groups produce similar spore types that cannot be distinguished by direct microscopic examination alone (i.e., *Aspergillus/Penicillium*, and others). Other spore types may lack distinguishing features that aid in their identification. These types are grouped into larger categories such as Ascospores or Basidiospores.

Fungal spores are identified and grouped by morphological characteristics including color, shape, septation, ornamentation, and fruiting structures (if present) which are compared to published mycological identification keys and texts. EMSL reports provide spore counts per cubic meter of air to three significant figures. Please note that each spore category is reported to three significant figures. Due to rounding and the application of three significant figures the sum of the individual spore numbers may not equal the total spore count on the report. EMSL does not maintain responsibility for final volume concentrations (counts/m3) since this volume is provided by the field collector and cannot be verified by EMSL.

EMSL analyzes spore traps using phase contrast microscopy. There is a wide choice of collection devices (Air-O-Cell, Micro-5, Burkhard, etc.) on the market. Differences in analytical method may exist between spore trap devices.

Spore trap results are reported in spores per cubic meter of air. Due to the other airborne particles collected with the spores, EMSL reports a background particle density. Background density is an indication of overall particulate matter present on the sample (i.e. dust in the air). High background concentrations may obscure spores such as the *Penicillium/Aspergillus* group. The rating system is from 1-5 with 1 = 1 - 25% of the background obscured by material, 2 = 26 - 50%, 3 = 51 - 75%, 4 = 76% - 99%, 5 = 100% or overloaded. A background rating of 4 or higher should be regarded as a minimum count since the actual concentrations may be higher than those reported. EMSL will not be held responsible for overloading of samples. Sample volumes are left to the discretion of the company or persons conducting the fieldwork.

Skin fragment density is the percentage of skin cells making up the total background material, 1 = 1 - 25%, 2 = 26 - 50%, 3 = 51 - 75%, 4 = 76-100%. Skin fragment density is considered an indication of the general cleanliness in the area sampled. It has been estimated that up to 90% of household dust consists of dead skin cells.

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	EMSL Analytical, Ind	
	1056 Stelton Road Piscataway, NJ Phone: (732) 981-0550 Fax: (732) 981-	08854 0551 Web: http://www.EMSL.com Email:piscatawaylab@emsl.com
Attn:	AHERA Consultants, INC	EMSL Order: 052201037
	AHERA Consultants, Inc.	Customer ID: AHER50
	PO Box 385	Collected: 3/14/2022
	Oceanville, NJ 08231-0385	Received: 3/15/2022
		Analyzed: 3/16/2022
Proj:	22-6032 / South Orange / Maplewood School D	istrict, Columbia High School, 17 Parker Avenue, Maplewood, NJ 07040
	2. Analytical Results	

See attached data reports and charts.

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# **EMSL Analytical, Inc.**

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AHERA Consultants, INC Attn: AHERA Consultants, Inc. PO Box 385 Oceanville, NJ 08231-0385 Web: http://www.EMSL.com Email:piscatawaylab@emsl.com

052201037 EMSL Order: AHER50 Customer ID: Collected: 3/14/2022 3/15/2022 Received: 3/16/2022 Analyzed:

Proj: 22-6032 / South Orange / Maplewood School District, Columbia High School, 17 Parker Avenue, Maplewood, NJ 07040

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

Lab Sample Number: Client Sample ID: Volume (L):	0	52201037-0001 CHS-01 150		052201037-0002 CHS-02 150					
Sample Location:	1s	t Floor Hallway	y	Outdo	Outdoor Control Sample				
Spore Types	Raw Count	Count/m <sup>3</sup>	% of Total	Raw Count	Count/m <sup>3</sup>	% of Total	-	-	-
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	1	20	6.3	10	220	16.8			
Aspergillus/Penicillium	-	-	-	3	70	5.3			
Basidiospores	9	200	62.5	41	900	68.7			
Bipolaris++	-	-	-	-	-	-			
Chaetomium++	-	-	-	-	-	-			
Cladosporium	5	100	31.3	5	100	7.6			
Curvularia	-	-	-	-	-	-			
Epicoccum	-	-	-	-	-	-			
Fusarium++		-	-	1	20	1.5			
Ganoderma	-	-	-	-	-	-			
Myxomycetes++	-	-	-	-	-	-			
Pithomyces++	-	-	-	-	-	-			
Rust	-	-	-	-	-	-			
Scopulariopsis/Microascu	-	-	-	-	-	-			
Stachybotrys/Memnoniella		-	-	-	-	-			
Unidentifiable Spores		-	-	-	-	-			
Zygomycetes	-	-	-	-	-	-			
Total Fungi	15	320	100	60	1310	100			
Hyphal Fragment	-	-	-	1	20	-			
Insect Fragment		-	-	-	-	-			
Pollen	-	-	-	17	370	-			
Analyt. Sensitivity 600x	-	22	-	-	22	-			
Analyt. Sensitivity 300x		7*	-	-	7*	-			
Skin Fragments (1-4)		2	-	-	1	-			
Fibrous Particulate (1-4)		1	-	-	1	-			
Background (1-5)		1	-	-	2	-			

	h the
Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.	Nicholas Maslowski, Microbiology Lab Manager
discernable field blank was submitted with this group of samples.	or Other Approved Signatory

N

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. 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. The report reletes the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality contr criteria and met method specifications unless otherwise noted. High levels 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. Skin & Fibrous ratings: 1 (1-25%), 2 (26-50%), 3 (51-75%), 4 (76-100%) of the background particles

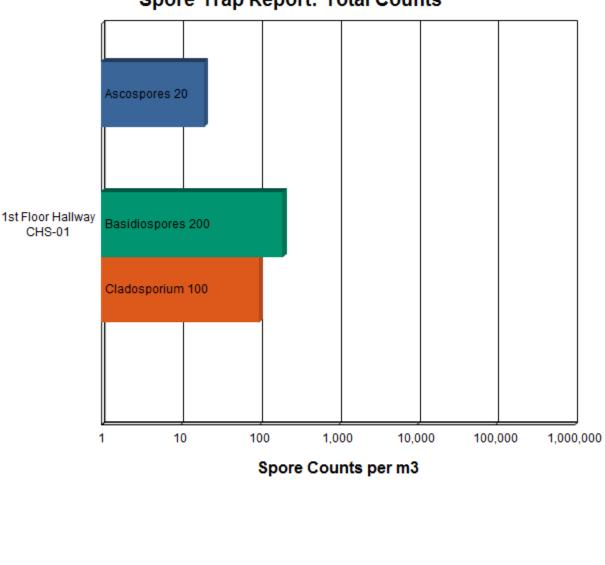
#### Initial report from: 03/18/2022 07:29:39

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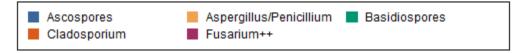
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			ataway, NJ 08854 Fax: (732) 981-0551	Web: http://www.EMSL	.com	Email:piscatawaylab@emsl.com	
Attn:	AHERA Co	onsultants, INC		EMSL Order:	05220	1037	
	AHERA Co	onsultants, Inc.		Customer ID:	AHER	50	
	PO Box 38	85		Collected:	3/14/2	022	
	Oceanville	NJ 08231-0385		Received:	3/15/2	022	
				Analyzed:	3/16/2	022	
Proj:	22-6032 / \$	South Orange / Maplewo	od School District, C	olumbia High School	l, 17 Par	ker Avenue, Maplewood, NJ 07040	



# Spore Trap Report: Total Counts

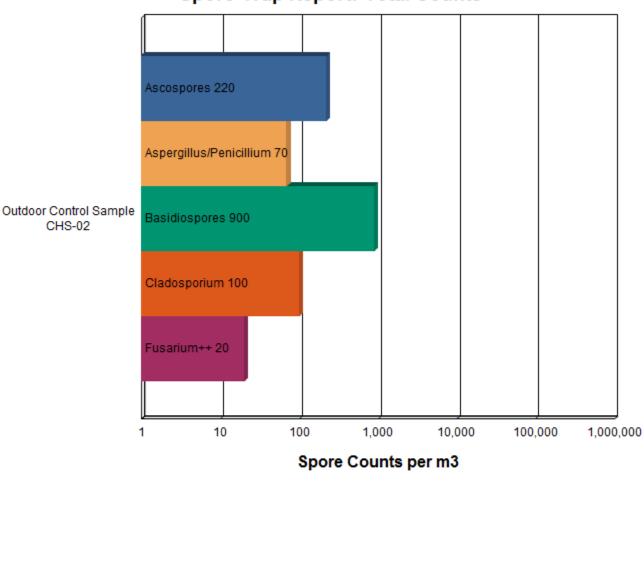


\* The chart is displayed using a logarithmic scale. Bar size is not directly proportional to the number of spores.

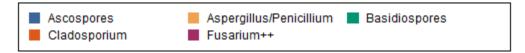
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Attn:	AHERA C	Consultants, INC	EMSL Order:	052201037
	AHERA C	Consultants, Inc.	Customer ID:	AHER50
	PO Box 3	85	Collected:	3/14/2022
	Oceanville	e, NJ 08231-0385	Received:	3/15/2022
			Analyzed:	3/16/2022
Proj:	22-6032 /	South Orange / Maplewood School District	, Columbia High School,	17 Parker Avenue, Maplewood, NJ 07040



# Spore Trap Report: Total Counts

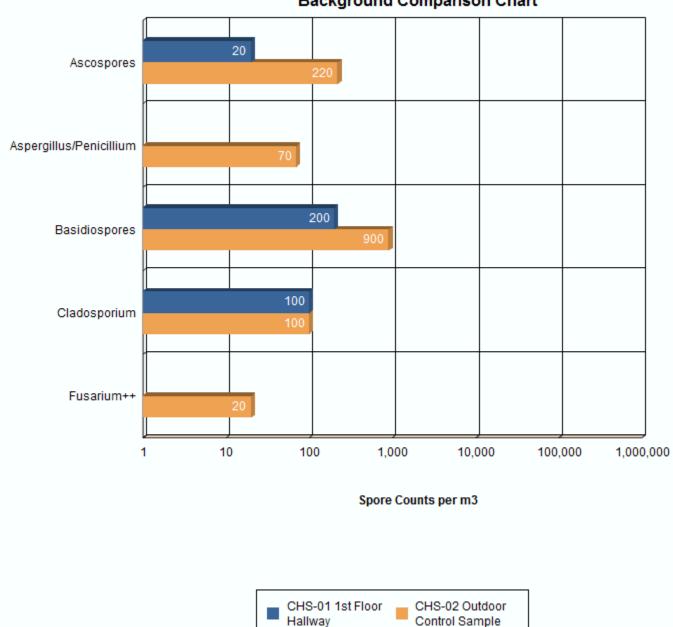


\* The chart is displayed using a logarithmic scale. Bar size is not directly proportional to the number of spores.

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Attn:	AHERA Co	onsultants, INC		EMSL Order:	052201037				
	AHERA Co	onsultants, Inc.		Customer ID:	AHER50				
	PO Box 38	5		Collected:	3/14/2022				
	Oceanville	, NJ 08231-0385		Received:	3/15/2022				
				Analyzed:	3/16/2022				
Proj:	22-6032 / \$	South Orange / Map	elewood School District	, Columbia High School,	l, 17 Parker Avenue, Maplewood, NJ 07040				



## **Background Comparison Chart**

\* The chart is displayed using a logarithmic scale. The bar size is not directly proportional to the number of spores.

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Attn:		onsultants, INC		EMSL Order:	052201037	,	
		onsultants, Inc.		Customer ID:	AHER50		
	PO Box 38			Collected:	3/14/2022		
	Oceanville	, NJ 08231-0385		Received:	3/15/2022		
				Analyzed:	3/16/2022		
Proj:	22-6032 /	South Orange / Map	lewood School District, (	Columbia High School,	, 17 Parker A	Venue, Maplewood, NJ 07040	

## 3. Understanding the Results

EMSL Analytical, Inc. is an independent laboratory, providing unbiased and scientifically valid results. These data represent only a portion of an overall IAQ investigation. Visual information and environmental conditions measured during the site assessment (humidity, moisture readings, etc.) are crucial to any final interpretation of the results. Many factors impact the final results; therefore, result interpretation should only be conducted by qualified individuals. The American Conference of Governmental Industrial Hygienists (ACGIH) has published a good reference book covering sampling and data interpretation. It is entitled, Bioaerosols: Assessment and Control, 1999.

Fungal spores are found everywhere. Whether or not symptoms develop in people exposed to fungi depends on the nature of the fungal material (e.g., allergenic, toxic, or infectious), the exposure level, and the susceptibility of exposed persons. Susceptibility varies with the genetic predisposition (e.g., allergic reactions do not always occur in all individuals), age, pre-existing medical conditions (e.g., diabetes, cancer, or chronic lung conditions), use of immunosuppressive drugs, and concurrent exposures. These reasons make it difficult to identify dose/response relationships that are required to establish "safe" or "unsafe" levels (i.e., permissible exposure limits).

It is generally accepted in the industry that indoor fungal growth is undesirable and inappropriate, necessitating removal or other appropriate remedial actions. The New York City guidelines and EPA guidelines for mold remediation in schools and commercial buildings define the conditions warranting mold remediation. Always remember that water is the key. Preventing water damage or water condensation will prevent mold growth.

This report is not intended to provide medical advice or advice concerning the relative safety of an occupied space. Always consult an occupational or environmental health physician who has experience addressing indoor air contaminants if you have any questions.

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# EMSL Analytical, Inc.

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#### Web: http://www.EMSL.com Email:piscatawaylab@emsl.com

 EMSL Order:
 052201037

 Customer ID:
 AHER50

 Collected:
 3/14/2022

 Received:
 3/15/2022

 Analyzed:
 3/16/2022

Proj: 22-6032 / South Orange / Maplewood School District, Columbia High School, 17 Parker Avenue, Maplewood, NJ 07040

## 4. Glossary of Fungi

ASCOSPORES	
Natural Habitat	Everywhere in nature.
Suitable Substrates in the Indoor Environment	Depends on genus and species.
Water Activity	Depends on genus and species.
Mode of Dissemination	Forcible ejection or passive release and dissemination by wind or insects.
Allergic Potential	Depends on genus and species.
Potential or Opportunistic Pathogens	Depends on genus and species.
Industrial Uses	Depends on genus and species.
Potential Toxins Produced	Depends on genus and species.
Other Comments	Ascospores are the result of sexual reproduction and produced in a saclike structure called an ascus. All ascospores belong to members of the Phylum Ascomycota, which encompasses a plethora of genera worldwide.

ASPERGILLUS/PENI	ASPERGILLUS/PENICILLIUM					
Natural Habitat	Plant debris ·Seed ·Cereal crops					
Suitable Substrates in the Indoor Environment	Grows on a wide range of substrates indoors ·Prevalent in water damaged buildings ·Foods (blue mold on cereals, fruits, vegetables, dried foods) ·House dust ·Fabrics ·Leather ·Wallpaper ·Wallpaper glue					
Water Activity	Aw=0.75-0.94					
Mode of Dissemination	Wind Insects					
Allergic Potential	Type I (hay fever, asthma) ·Type III (hypersensitivity)					
Potential or Opportunistic Pathogens	Possible depending on the species.					
Industrial Uses	Many depending on the species					
Potential Toxins Produced	Possible depending on the species.					
Other Comments	Spores of Aspergillus and Penicillium (including others such as Acremonium, Talaromyces, and Paecilomyces) are small and spherical with few distinguishing characteristics. They cannot be differentiated or speciated by non-viable impaction sampling methods. Some species with very small spores may be undercounted in samples with high background debris.					

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Attn: AHERA Consultants, INC AHERA Consultants, Inc. PO Box 385 Oceanville, NJ 08231-0385 
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Proj: 22-6032 / South Orange / Maplewood School District, Columbia High School, 17 Parker Avenue, Maplewood, NJ 07040

BASIDIOSPORES	
Natural Habitat	Forest floors. Lawns .Plants (saprobes or pathogens depending on genus)
Suitable Substrates in the Indoor Environment	Depends on genus. Wood products
Water Activity	Unknown.
Mode of Dissemination	Forcible ejection. Wind currents.
Allergic Potential	Type I allergies (hay fever, asthma). Type III (hypersensitivity pneumonitis)
Potential or Opportunistic Pathogens	Depends on genus.
Industrial Uses	Edible mushrooms are used in the food industry.
Potential Toxins Produced	Amanitins. monomethyl-hydrazine. muscarine. ibotenic acid. psilocybin.
Other Comments	Basidiospores are the result of sexual reproduction and formed on a structure called the basidium. Basidiospores belong to the members of the Phylum Basidiomycota, which includes mushrooms, shelf fungi, rusts, and smuts.

CLADOSPORIUM	
Natural Habitat	Dead plant matter. Straw. Soil. Woody plants
Suitable Substrates in the Indoor Environment	Fiberglass duct liner. Paint. Textiles. Found in high concentration in water-damaged building materials.
Water Activity	Aw 0.84-0.88
Mode of Dissemination	Air
Allergic Potential	Type I (asthma and hay fever).
Potential or Opportunistic Pathogens	Edema. keratitis. onychomycosis. pulmonary infections. Sinusitis.
Industrial Uses	Produces 10 antigens.
Potential Toxins Produced	Cladosporin and Emodin.

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Attn:	AHERA C	onsultants, INC		EMSL Order:	05220	01037
	AHERA C	onsultants, Inc.		Customer ID:	AHER	250
	PO Box 3	85		Collected:	3/14/2	2022
	Oceanville	e, NJ 08231-0385		Received:	3/15/2	2022
				Analyzed:	3/16/2	2022
Proj:	22-6032 /	South Orange / Map	lewood School District, Co	,	, 17 Pa	rker Avenue, Maplewood, NJ 07040
FU	SARIUN	/++				

FUSARIUM++	-
Natural Habitat	Soil. Plant pathogen causing root rot, stem rot, and wilt of many ornamental and crop plants. Genera with like spores include Fusarium, Albonectria, Atractium, Bisifusarium, Corinectria, Cosmospora, Cosmosporella, Cyanonectria, Dialonectria, Fusicolla, Geejayessia, Ilyonectria, Luteonectria, Macroconia, Mariannaea, Microcera, Neocosmospora, Neonectria, Nothofusarium, Pseudofusicolla Rectifusarium, Rugonectria, Scolecofusarium, Setofusarium, Stylonectria, Thelonectria, and Tumenectria.
Suitable Substrates in the Indoor Environment	Often found in humidifiers. Wet, cellulose-based building materials
Water Activity	Aw=0.86-0.91
Mode of Dissemination	Insects. Water droplets, rain. Wind when spores become dry.
Allergic Potential	Type I allergies (hay fever, asthma).
Potential or Opportunistic Pathogens	Esophageal cancer is believed to happen after consumption of F. moniliforme infected corn. Keratitis. Endophthalmitis. Onychomycosis. Cutaneous infections. Mycetoma. Sinusitis. Pulmonary infections. Endocarditis. Peritonitis. Central venous catheter infections. Septic arthritis. Neurological disease in horses after consumption of F. moniliforme infected corn. Respiratory disease in pigs after consumption of F. moniliforme infected corn.
Industrial Uses	Biological Weapon.
Potential Toxins Produced	Trichothecenes. Zearalenone. Fumonisins.
Other Comments	Major plant pathogen.
Reference	Atlas of Moulds in Europe causing respiratory Allergy, Foundation for Allergy Research in Europe, Edited by Knud Wilken-Jensen and Suzanne Gravesen, ASK Publishing, Denmark, 1984.

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	PO Box 38	5		Collected:	3/14/2022
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				Analyzed:	3/16/2022
Proj:	22-6032 / 3	South Orange / Map	olewood School Distri	ct, Columbia High School	l, 17 Parker Avenue, Maplewood, NJ 07040

## 5. Important Terms, Conditions, and Limitations

#### Sample Retention

Samples analyzed by EMSL will be retained for 60 days after analysis date Storage beyond this period is available for a fee with written request prior to the initial 30-day period. Samples containing hazardous/toxic substances which require special handling will be returned to the client immediately. EMSL reserves the right to charge a sample disposal fee or return samples to the client.

## Change Orders and Cancellation

All changes in the scope of work or turnaround time requested by the client after sample acceptance must be made in writing and confirmed in writing by EMSL. If requested changes result in a change in cost the client must accept payment responsibility. In the event work is cancelled by a client, EMSL will complete work in progress and invoice for work completed to the point of cancellation notice. EMSL is not responsible for. holding times that are exceeded due to such changes.

#### Warranty

EMSL warrants to its clients that all services provided hereunder shall be performed in accordance with established and recognized analytical testing procedures and with reasonable care in accordance with applicable federal, state and local laws. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied. EMSL disclaims any other warranties, express or implied, including a warranty of fitness for particular purpose and warranty of merchantability.

#### Limits of Liability

Test Report EXMold-2.1.0.0 Printed: 3/19/2022 04:37:22PM

In no event shall EMSL be liable for indirect, special, consequential, or incidental damages, including, but not limited to, damages for loss of profit or goodwill regardless of the negligence (either sole or concurrent) of EMSL and whether EMSL has been informed of the possibility of such damages, arising out of or in connection with EMSL's services thereunder or the delivery, use, reliance upon or interpretation of test results by client or any third party. We accept no legal responsibility for the purposes for which the client uses the test results. EMSL will not be held responsible for the improper selection of sampling devices even if we supply the device to the user. The user of the sampling device has the sole responsibility to select the proper sampler and sampling conditions to ensure that a valid sample is taken for analysis. Any resampling performed will be at the sole discretion of EMSL, the cost of which shall be limited to the reasonable value of the original sample delivery group (SDG) samples. In no event shall EMSL

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	PO Box 38		Collected:	3/14/2022
	Oceanville	e, NJ 08231-0385	Received:	3/15/2022
			Analyzed:	3/16/2022
Proj:	22-6032 /	South Orange / Maplewood School District,	Columbia High School,	17 Parker Avenue, Maplewood, NJ 07040

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be liable to a client or any third party, whether based upon theories of tort, contract or any other legal or equitable theory, in excess of the amount paid to EMSL by client thereunder.

Indemnification

Client shall indemnify EMSL and its officers, directors and employees and hold each of them harmless for any liability, expense or cost, including reasonable attorney's fees, incurred by reason of any third-party claim in connection with EMSL services, the test result data or its use by client

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# **Chain of Custody**

05 2261044

**Project No:** 22-6032 Client: AHERA Consultants, Inc. PO Box 385 Project Name: Columbia High School Oceanville, NJ 08231-0385 17 Parker Avenue Phone: (609) 652-1833 Maplewood, NJ 07040 E-Mail: info@aherainc.com Contact: E. Clarkson Fax: (609) 652-1140 TYPE: 2.4 ASBESTOS LEAD OTHER AIR SOIL AIR SOIL BULK BŪLK DUST PAINT WATER OTHER WATER OTHER ANALYSIS METHOD: PCM: NIOSH 7400 PLM: **BULK ASBESTOS EPA600** TEM: AHERA PCM: OSHA PLM: POINT COUNTING TEM: NIOSH 7402 PCM: OTHER PLM: OTHER TEM: EPA LEVEL II PLM EPA NOB (gravimetric reduction) TEM: ASBESTOS IN WATER TEM: AAS LEAD IN DRINKING WATER **BULK ANALYSIS** AAS LEAD IN PAINT - **—**-TEM: - MICROVAC DUST AAS OTHER LEAD TEM: EPA NOB (gravimetric reduction) 🗌 AAS OTHER METALS TOTAL DUST: EPA/OSHA 🗌 AAS 🛛 NIOSH 7082 (LEAD IN AIR) TURN AROUND TIME: 5 DAX 🔀 72 HOUR 🗍 48 HOUR 🗌 24 HOUR 🗌 6 HOUR **SAMPLE NUMBERS:** CHS-OI TO CHS-OI TOTAL: 1EA-**CLIENT SAMPLE NUMBERS:** DATE: 03/14/2022 TIME: **RELINQUISHED:** in. TIME: \_\_\_\_\_ DATE: \_\_\_\_ RECEIVED: SAMPLE LOG-IN: DATE: TIME: \_\_\_\_\_ DATE: TIME: \_\_\_\_\_ ANALYZED: TIME: \_\_\_\_\_ REVIEWED: DATE: ARCHIVED: \_\_\_\_\_ DATE: TIME: TIME: RELEASED:

ERA Consultants

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PO Box 385 Oceanville, NJ 08231-0385

Page 1 Of 2

## **AIR MONITORING DATA SHEET**

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CLIENT:	AHERA Consultants, Inc.		Γ	DATE:	03/1	4/202	72	
	PO Box 385					/ -		
	Oceanville, NJ 08231-0385		ļ	ANALYS	IS:			
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SITE ADD	RESS: Columbia High School		L	.OT #:	-			
	17 Parker Avenue		Ε	BLDG:		FLOOR:	<u></u>	
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ССАНЕР	RA Consultants				BY EMSL PISC	CATAWAY		PO Box 385 nville, NJ 08231-0385 Phone: 609.652.1833 Fax: 609.652.1140 ahera@aherainc.com

Page 2 Of 2

OrderID: 052201037

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HERA Consultants					PO Box 3 Oceanviile, NJ 08231-03 PHONE: 609.652.18 FAX: 609.652.11		
	MICROBIOLOG	iY – CH	AIN OF	CUSTODY			
Date Collec	ted: 03/14/2020	7	Date Sub	mitted: 03	114/2020		
Contact: E. Clarl			Company	· AHERA Co	nsultants, Inc.		
Project Location:			company	PO Box 38			
	17 Parker Avenue			Oceanville	, NJ 08231-0385		
	Maplewood, NJ 07040		Phone:	<u>(</u> 609) 652-	1833		
			Fax:	(609) 652-	1140		
Client: South (	Drange / Maplewood School	District	E-mail:	<u>info@ah</u>	<u>erainc.com</u>		
	Job Number	r: 22-6032					
	Air Samples		Wij	oe & Bulk Sam	ples		
	by Air-O-Cell Cassette		_	Direct Examinati	on		
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