

Scientific Air Solutions



airPHX Companies
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March 14, 2019

Pre and In-Treatment Air and Surface Report – [REDACTED]

A. Summary – Air Samples

Pre and In-treatment air samples results given below.

Sample Date	Number of samples	Location	Average (cfu/m ³)	Range	Standard Deviation	Percent Difference
11/29/18	15	Various	433	233/767	141.9	-
01/10/19			4	0.0/33	11	99.0
11/29/18	1	Exterior	1,400	1,400/1,400	-	-
01/10/19			1,367	1,367/1,367	-	2.4

Background

All air samples were taken via the MB-1 air sampler, 30 liters per sample throughout the various locations given above with results normalized to colony forming units per cubic meter of air (CFU/m³).

Noted below are the finding of the types of airborne organisms found in the above locations excluding the outside during this **in-treatment** sampling.

Species	Raw Count	Species	Raw Count
<i>Penicillium, aspergillus types</i>	39	<i>Penicillium purpurascens</i>	< 5
<i>Penicillium purpurogenum</i>	28	<i>Absidia, spp</i>	< 5
<i>Cladosporium sphaerospermum</i>	< 5	<i>Mortierella, spp</i>	< 5
<i>Aspergillus fumigatus</i>	< 5	<i>Basidiospores spp</i>	< 5

Given below are the finding of the types of airborne organisms found in the above locations excluding the outside during this **pre-treatment** sampling.

Species	Raw Count	Species	Raw Count
<i>Penicillium, aspergillus types</i>	2,910	<i>Penicillium purpurogenum</i>	470
<i>Penicillium purpurascens</i>	2,150	<i>Absidia, spp</i>	387
<i>Cladosporium sphaerospermum</i>	1,010	<i>Mortierella, spp</i>	258
<i>Aspergillus fumigatus</i>	550	<i>Basidiospores spp</i>	165

01/10/19 - In-treatment bioburden in the sampled locations yield a **99.0% reduction** and are now < 100 cfu/m³ which is considered **clean and acceptable**

11/29/18 - Pre-treatment bioburden in the sampled locations are above > 300 cfu/m³, which is not acceptable and needs corrective action.

Observations

Outside air, sample was **1,367 – 1,400 cfu/m³**, which exhibits a significant amount of the bioburden continues to come from the outside air. However, it is apparent that the airPHX unit is eliminating almost all of this bioburden.

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Target Air Quality

Air quality scale for workplaces, public buildings, schools, and homes are as follows:

- $< 100 \text{ cfu/m}^3$ is considered **clean and acceptable**.
- 100 to 300 cfu/m^3 is **marginal**.
- $> 300 \text{ cfu/m}^3$ is **not acceptable** and needs corrective action.

In most cases, air quality $< 100 \text{ cfu/m}^3$ has shown a decrease in the overall bioburden and odors.

B. Summary – Surface Contact Swabs

Pre and In-treatment surface (swab) samples results given below.

Sample Date	Number of samples	Location	Average (cfu/cm ²)	Range	Standard Deviation	Percent Difference
11/29/18	14	Various	57.9	25/125	26.3	-
01/10/19			2.8	1.0/5.5	1.06	95.2
11/29/18	1	Negative Control	0	0/0	-	-
01/10/19			0	0/0	-	-

01/10/19 - In-treatment contact swab results in all the various locations show a **95.2% reduction** and are $< 5 \text{ cfu/cm}^2$ and now considered **clean and acceptable**

11/29/18 - Pre-treatment contact swab results in all the various locations are appreciably $> 10 \text{ cfu/cm}^2$, which is not acceptable and needs corrective action.

Target Contact Surface Quality

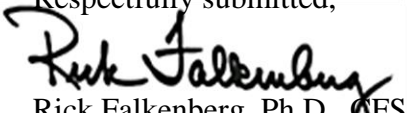
Contact surface quality scale for workplaces, public buildings, schools, and homes are as follows:

- $< 5 \text{ cfu/cm}^2$ is considered **clean and acceptable**.
- 5 to 10 cfu/cm^2 is considered **marginal**.
- $> 10 \text{ cfu/cm}^2$ is considered **not acceptable** and needs corrective action.

In most cases, surface (swab) sample with $< 5 \text{ cfu/cm}^2$ show a decrease in the overall bioburden and odors.

Please contact me if there are questions or if further information is needed.

Respectfully submitted,


Rick Falkenberg, Ph.D., QFS
Senior Principal Scientist

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Table #1

01/10/19 In-treatment Air Sample Results - CFU/m³

In-treatment 01/10/19							
Plate Lot No.	Air Sample Plate #	Air Sample Sample #	Air Sample Location	Liters of Air	Raw Count	Corrected Count	CFU/m ³
462	N/A	N/A	Unopened	0	0	0	0
425821	463	1	Front doors	30	0	0	0
425821	461	2	Outside front doors	30	0	0	0
425821	460	3	Stage	30	1	1	33
425821	459	4	Back stage L	30	0	0	0
425821	466	5	Back stage R	30	0	0	0
425821	465	6	Front Auditorium R	30	0	0	0
425821	459	7	Men's bathroom	30	0	0	0
425821	457	8	First Floor Hall HW1 Right Hall	30	0	0	0
425821	1291	9	First Floor Hall HW2 Left Hall	30	1	0	0
425821	1289	10	Main Entrance OB1	30	0	0	0
425821	1288	11	Mail Room OB2	30	0	0	0
425821	1287	12	2nd Floor UP1 Left Hall	30	1	1	33
425821	1286	13	2nd Floor UP2 Right Hall	30	0	0	0
425821	1285	14	2nd Floor Up3 End of hall	30	0	0	0
425821	1284	15	Elevator	30	0	0	0
425821	1290	1	Exterior	30	37	41	1,367

Avg	4	High	33
Low	0	SD	11

Avg	1,367	High	1,367
Low	1,367	SD	0

Total Adjusted Raw Count

43

Total CFU/m³

67

Table #1

11/29/18 Pre-treatment Air Sample Results - CFU/m³

Pre-treatment 11/29/18							
Plate Lot No.	Air Sample Plate #	Air Sample Sample #	Air Sample Location	Liters of Air	Raw Count	Corrected Count	CFU/m ³
462	N/A	N/A	Unopened	0	0	0	0
425821	463	1	Front doors	30	14	14	467
425821	461	2	Outside front doors	30	22	23	767
425821	460	3	Stage	30	10	10	333
425821	459	4	Back stage L	30	15	16	533
425821	466	5	Back stage R	30	13	13	433
425821	465	6	Front Auditorium R	30	11	11	367
425821	459	7	Men's bathroom	30	18	19	633
425821	457	8	First Floor Hall HW1 Right Hall	30	16	17	567
425821	1291	9	First Floor Hall HW2 Left Hall	30	14	14	467
425821	1289	10	Main Entrance OB1	30	10	10	333
425821	1288	11	Mail Room OB2	30	8	8	267
425821	1287	12	2nd Floor UP1 Left Hall	30	7	7	233
425821	1286	13	2nd Floor UP2 Right Hall	30	9	9	300
425821	1285	14	2nd Floor Up3 End of hall	30	10	10	333
425821	1284	15	Elevator	30	14	14	467
425821	1290	1	Exterior	30	38	42	1,400

Avg	433	High	767
Low	233	SD	141.9

Avg	1,400	High	1,400
Low	1,400	SD	0.0

Total Adjusted Raw Count

237

Total CFU/m³

7,900



Table #2

01/10/19 In-treatment Surface Sample Results – CFU/cm²

In-treatment 01/10/19						
Lot #	Location	Room	Surface Swab Sample Location	10x10x10 cm	Raw Count	CFU/cm2
18J1833	S	CTRL	Control swab	0	0	0
18J1833	S	1	Table back room	10x10x10	150	1.5
18J1833	S	2	First row chair 1	10x10x10	275	2.8
18J1833	S	3	Stage	10x10x10	410	4.1
18J1833	S	4	Lecturn	10x10x10	550	5.5
18J1833	S	5	Last row chair	10x10x10	245	2.5
18J1833	S	6	Door handle/back room	10x10x10	315	3.2
18J1833	S	7	7th chair first row	10x10x10	285	2.9
18J1833	S	8	Autorium handle	10x10x10	325	3.3
18J1833	S	9	Men's bathroom door handle	10x10x10	275	2.8
18J1833	S	10	Men's bathroom countertop	10x10x10	241	2.4
18J1833	S	11	Sitting area	10x10x10	100	1.0
18J1833	S	12	Elevator inside keys	10x10x10	240	2.4
18J1833	S	13	Mail room box 18	10x10x10	175	1.8
18J1833	S	14	Key pad customer service	10x10x10	285	2.9

Avg 2.8 Max 5.5
Min 1.0 SD 1.06

Total Adjusted Raw Count 3,871
Total CFU/cm2 39

Table #2

11/29/18 Pre-treatment Surface Sample Results – CFU/cm²

Pre-treatment 11/29/18						
Lot #	Location	Room	Surface Swab Sample Location	10x10x10 cm	Raw Count	CFU/cm2
18J1833	S	CTRL	Control swab	0	0	0
18J1833	S	1	Table back room	10x10x10	2,500	25.0
18J1833	S	2	First row chair 1	10x10x10	5,250	52.5
18J1833	S	3	Stage	10x10x10	9,500	95.0
18J1833	S	4	Lecturn	10x10x10	12,500	125.0
18J1833	S	5	Last row chair	10x10x10	4,500	45.0
18J1833	S	6	Door handle/back room	10x10x10	6,250	62.5
18J1833	S	7	7th chair first row	10x10x10	5,000	50.0
18J1833	S	8	Autorium handle	10x10x10	7,500	75.0
18J1833	S	9	Men's bathroom door handle	10x10x10	6,450	64.5
18J1833	S	10	Men's bathroom countertop	10x10x10	3,750	37.5
18J1833	S	11	Sitting area	10x10x10	2,500	25.0
18J1833	S	12	Elevator inside keys	10x10x10	4,750	47.5
18J1833	S	13	Mail room box 18	10x10x10	3,750	37.5
18J1833	S	14	Key pad customer service	10x10x10	6,850	68.5

Avg 57.9 Max 125.0
Min 25.0 SD 26.34

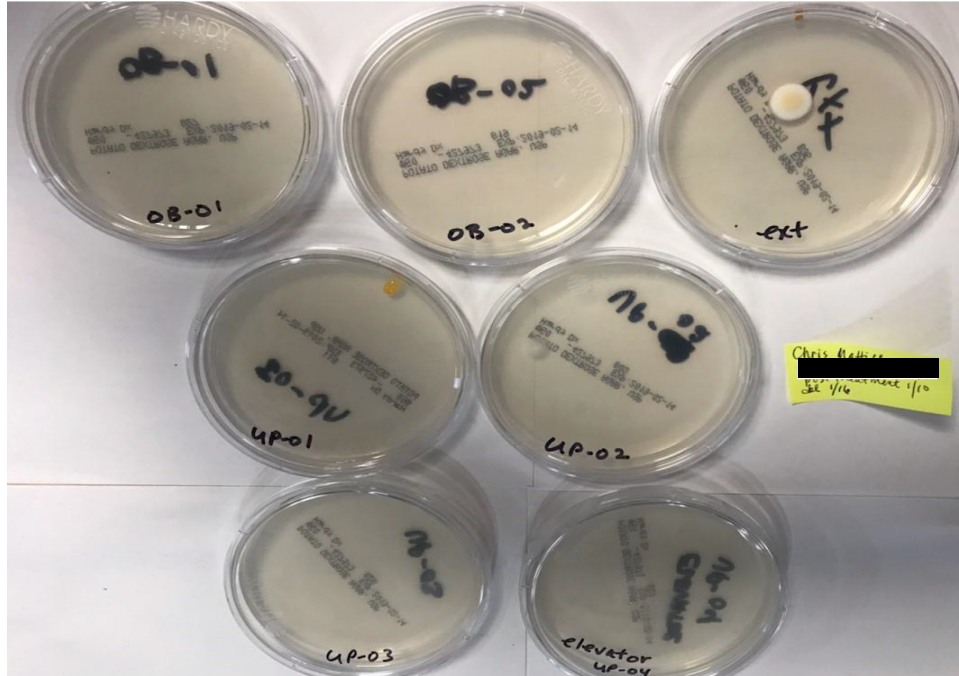
Total Adjusted Raw Count 81,050
Total CFU/cm2 811



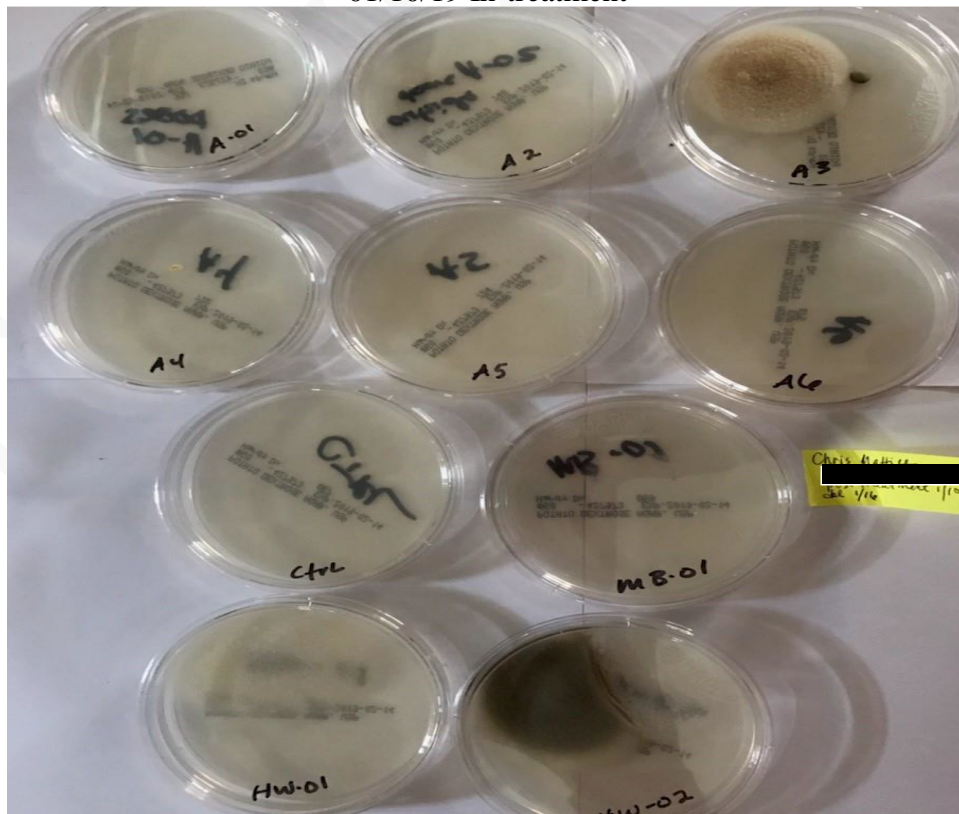
Table #3

Air Sample Pictures

01/10/19 In-treatment

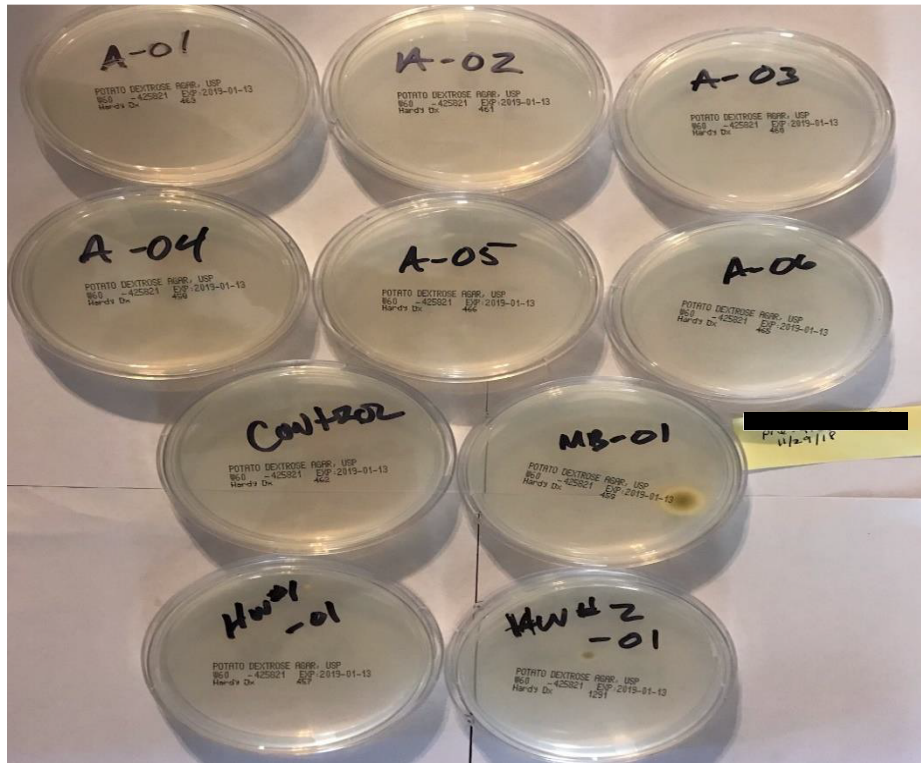


01/10/19 In-treatment

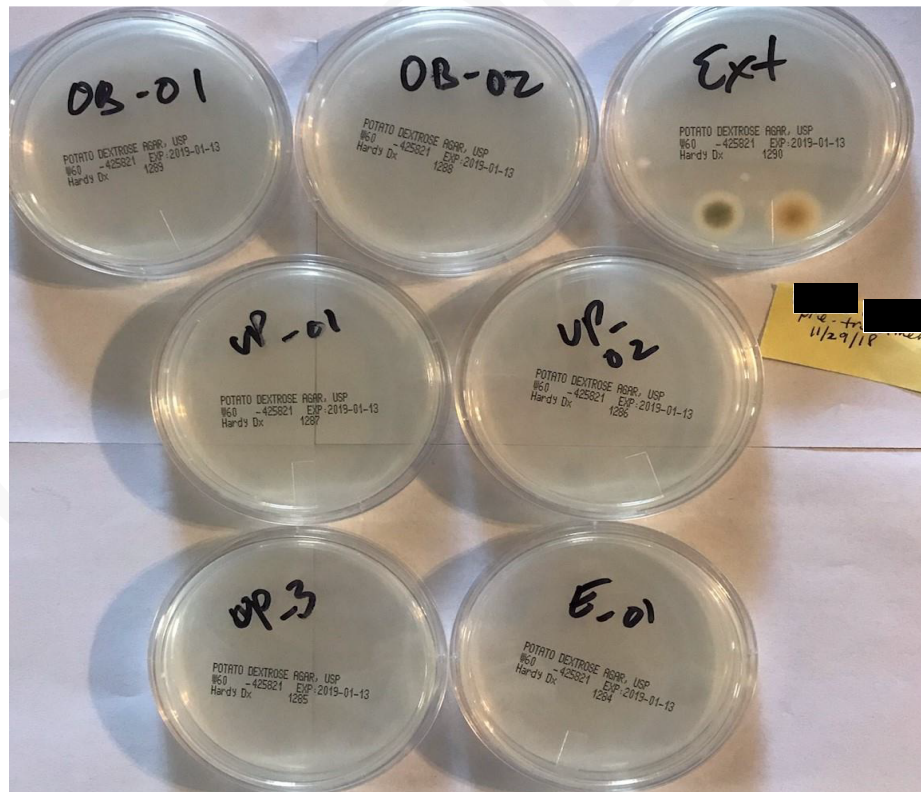




11/29/18 Pre-treatment



11/29/18 Pre-treatment



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Table #4
[REDACTED]
Air Sample Locations

01/10/19 In-treatment
Air PHX Sampling Form

Facility: [REDACTED] POST-Treatment Form
Date: 1/10/19

air Sample Lot #	Plate #	Room	Test Location	Notes.
427973		756 A01	at Front Doors	
427973		748 A02	Outside Frt Doors	
427973		740 A03	Stage	
427973		732 A04	Back Stage L	
427973		724 A05	Back Stage R	
427973		875 A06	Frt Auditorium R	
427973		867 CTRL		
427973		859 MB-01	Mens Bathroom	
427973		851 HW01	Hallway R Side of Auditorium	
427973		843 HW02	Hallway L Side of Auditorium	
427973		827 OB 01		
427973		819 OB 02		
427973		835 EXT		
427973		811 UP01	Upstairs to L of Stairs	
427973		803 UP02	Upstairs to R of Stairs	
427973		828 UP03	Up Stairs to R and down hallway	
427973		820 Elev	Elevator	

11/29/18 Pre-treatment, Air samples

Air PHX Sampling Form

Facility: [REDACTED] Pre-Treatment Form
Date: 11/29/18

air Sample Lot #	Plate #	Room	Test Location	Notes.
425821		463 A01	at Front Doors	
425821		461 A02	Outside Frt Doors	
425821		460 A03	Stage	
425821		459 A04	Back Stage L	
425821		466 A05	Back Stage R	
425821		465 A06	Frt Auditorium R	
425821		462 CTRL		
425821		459 MBth01	Mens Bathroom	
425821		457 HW01		
425821		1291 HW02		
425821		1289 OB 01		
425821		1288 OB 02		
425821		1290 EXT		
425821		1287 UP01		
425821		1286 UP02		
425821		1285 UP03		
425821		1284 Elev	Elevator	



01/10/19 In-treatment, Surface Samples

Facility:			
Date		1/10/19	
Air PHX Sampling Form			
Surface Sample		POST -Treatment Form	
Lot #		Room	Test Location
18J1833	S	A01	Table back Room
18J1833	S	A02	First Row Chair 1
18J1833	S	A03	Stage
18J1833	S	A04	Lecturn
18J1833	S	A05	Last Row Chair
18J1833	S	A06	Door Handle/Back Room
18J1833	S	A07	7th Chair first Row
18J1833	S	ADMIN01	Auditorium Handle
18J1833	S	ADMIN02	Mens bathroom Door handle
18J1833	S	ADMIN03	Mens Bathroom Countertop
18J1833	S	ADMIN04	Sitting Area
18J1833	S	ADMIN05	Elevator Inside keys
18J1833	S	ADMIN06	Mail Room Box 18
18J1833	S	ADMIN07	Key pad customer service

11/29/18 Pre-treatment, Surface Samples

Facility:			
Date		11/29/18	
Air PHX Sampling Form			
Surface Sample		Pre-Treatment Form	
Lot #		Room	Test Location
18J1833	S	A01	Table back Room
18J1833	S	A02	First Row Chair 1
18J1833	S	A03	Stage
18J1833	S	A04	Lecturn
18J1833	S	A05	Last Row Chair
18J1833	S	A06	Door Handle/Back Room
18J1833	S	A07	7th Chair first Row
18J1833	S	ADMIN01	Auditorium Handle
18J1833	S	ADMIN02	Mens bathroom Door handle
18J1833	S	ADMIN03	Mens Bathroom Countertop
18J1833	S	ADMIN04	Sitting Area
18J1833	S	ADMIN05	Elevator Inside keys
18J1833	S	ADMIN06	Mail Room Box 18
18J1833	S	ADMIN07	Key pad customer service