



airPHX Companies  
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April 7, 2020

## Pre and In-Treatment Air and Surface Report – USSA Center of Excellence - ATR

### A. Summary – Air Samples

Pre and in-treatment air samples results given below.

Sample Date	Treatment	Number of samples	Location	Average (cfu/m <sup>3</sup> )	Range	Standard Deviation	% Reduction
10/22/2019	Pre	8	ATR	321	133/533	111.7	-
03/30/2020	In			<b>9</b>	<b>0/33</b>	<b>16.1</b>	<b>97.2</b>
10/22/2019	Pre	2	Hydro	183	167/200	16.7	-
03/30/2020	In			<b>17</b>	<b>0/33</b>	<b>16.7</b>	<b>90.7</b>
10/22/2019	Pre	5	Weight	327	267/400	53.3	-
03/30/2020	In			<b>20</b>	<b>0/67</b>	<b>26.7</b>	<b>93.9</b>
10/22/2019	Pre	2	Wax	367	300/433	66.7	-
03/30/2020	In			<b>0</b>	<b>0/0</b>	<b>0.0</b>	<b>100</b>
10/22/2019	Pre	2	Exterior	2,617	2,567/2,667	50.0	-
03/30/2020	In			<b>2,633</b>	<b>2,600/2,667</b>	<b>33.3</b>	<b>+0.6</b>

### 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/m<sup>3</sup>).

Given below are airborne organisms found in for the **pre-treatment** sampling, excluding the outside samples.

Species	Raw Count	Species	Raw Count
<i>Penicillium, aspergillus types</i>	110	<i>Ulocladium chartarum</i>	< 5
<i>Aspergillus fumigatus</i>	80	<i>Penicillium brevicompactum</i>	< 5
<i>Cladosporium sphaerospermum</i>	10	<i>Absidia spp</i>	< 5
<i>Penicillium purpurogenum</i>	< 5	<i>Firmicutes spp</i>	< 5

Noted below are airborne organisms found for this **in-treatment** sampling, excluding the outside samples.

Species	Raw Count	Species	Raw Count
<i>Penicillium, aspergillus types</i>	1,155	<i>Ulocladium chartarum</i>	500
<i>Aspergillus fumigatus</i>	975	<i>Penicillium brevicompactum</i>	480
<i>Cladosporium sphaerospermum</i>	820	<i>Absidia spp</i>	330
<i>Penicillium purpurogenum</i>	760	<i>Firmicutes spp</i>	280

10/22/2019 - Pre-treatment bioburden in the above locations are > 300 cfu/m<sup>3</sup> which is not acceptable and needs corrective action.

**03/30/2020** - In-treatment results show a **97.2% decrease** in the **ATR/Doctor's office** which is now < 100 cfu/m<sup>3</sup> and considered **clean and acceptable**

- The **Hydro, Weight** and **Wax** rooms are out of the direct airPHX treatment area and have seen a “halo effect” and are showing a **90.7%, 93.9%** and **100% reduction**, respectively.



## Observations

The exterior air samples ranged from **2,567** to **2,667 cfu/m<sup>3</sup>** and reveals that most of the bioburden continues to come from the outside air. The airPHX units are having a noticeable impact on reducing the bioburden.

## Target Air Quality

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

- < 100 cfu/m<sup>3</sup> is considered **clean and acceptable**.
- 100 to 300 cfu/m<sup>3</sup> is **marginal**.
- > 300 cfu/m<sup>3</sup> is **not acceptable** and needs corrective action.

In most cases, air quality < **100 cfu/m<sup>3</sup>** has shown a decrease in the overall bioburden and odors.

*Although the predominant organisms noted in this report are fungi, previous testing results show bacteria, viruses and protozoa are eliminated as effectively as fungi. The reactive oxygen species (ROS) generated is effective on gram +, gram – bacteria, protozoa, spores and viruses.*

## B. Summary – Surface Contact Swabs

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

Sample Date	Treatment	Number of samples	Location	Average (cfu/cm <sup>2</sup> )	Range	Standard Deviation	% Reduction
10/22/2019	Pre	9*	Various	46.7	21.5/86.5	19.1	-
03/30/2020	In	10		<b>3.3</b>	<b>0.9/8.3</b>	<b>2.4</b>	<b>92.9</b>
10/22/2019	Pre	1	Neg. Control	0	0/0	-	-
03/30/2020	In			0	0/0	-	-

\* Sample #4, training table was moved out of the building.

10/22/2019 - Pre-treatment contact swab results from the various locations are noticeably > 5 cfu/cm<sup>2</sup> which is not acceptable and needs corrective action.

**03/30/2020 - In-treatment** results show a **92.9% reduction** and now is < **5 cfu/cm<sup>2</sup>** which is **clean and acceptable**, per the Target Contact Surface Quality guide.

## Target Contact Surface Quality

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

- < 5 cfu/cm<sup>2</sup> is considered **clean and acceptable**.
- 5 to 10 cfu/cm<sup>2</sup> is considered **marginal**.
- > 10 cfu/cm<sup>2</sup> is considered **not acceptable** and needs corrective action.

In most cases, surface swabs < **5 cfu/cm<sup>2</sup>** has shown a decrease in the overall bioburden and odors.

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

Respectfully submitted,

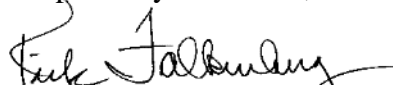
  
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Senior Principal Scientist



Table #1  
**USSA Center of Excellence ATR**  
 03/30/2020 In-treatment Air Sample Results - CFU/m<sup>3</sup>

In-treatment 03/30/2020 - USSA Center of Excellence - ATR						
Plate Lot No.	Air Sample Location	Air Sample Location	Liters of Air	Raw Count	Corrected Count	CFU/m <sup>3</sup>
2222	Ctrl	Unopened	0	0	0	0
2230	1	ATR	30	1	1	33
2214	2	ATR	30	0	0	0
2246	3	ATR	30	0	0	0
2238	4	ATR	-	-	-	-
2254	5	ATR	30	0	0	0
2262	6	ATR	30	0	0	0
2270	7	ATR	30	1	1	33
2278	8	Doc's office	30	0	0	0
2286	9	Hydro	30	0	0	0
2224	10	Hydro	30	1	1	33
2216	11	Weight	30	0	0	0
2232	12	Weight	30	1	1	33
2240	13	Weight	30	0	0	0
2248	14	Weight	30	2	2	67
2256	15	Weight	30	0	0	0
2264	16	Wax	30	0	0	0
2272	17	Wax	30	0	0	0
2280	1	Exterior	30	63	80	2,667
22880	2	Exterior	30	66	78	2,600

Avg	9	High	33
Low	0	SD	16.1
Avg	17	High	33
Low	0	SD	16.7
Avg	20	High	67
Low	0	SD	26.7
Avg	0	High	0
Low	0	SD	0.0
Avg	2,633	High	2,667
Low	2,600	SD	33.3

Total Adjusted Raw Count 6  
 Total CFU/m<sup>3</sup> 200

Table #1, continued  
**USSA Center of Excellence ATR**  
 10/22/2019 Pre-treatment Air Sample Results - CFU/m<sup>3</sup>

Pre-treatment 10/22/2019 - USSA Center of Excellence - ATR						
Plate Lot No.	Air Sample Location	Air Sample Location	Liters of Air	Raw Count	Corrected Count	CFU/m <sup>3</sup>
2351	Ctrl	Unopened	0	0	0	0
2352	1	ATR	30	12	12	400
2353	2	ATR	30	15	16	533
23544	3	ATR	30	8	8	267
2355	4	ATR	30	7	7	233
2356	5	ATR	30	4	4	133
2357	6	ATR	30	10	10	333
2358	7	ATR	30	9	9	300
2359	8	Doc's office	30	11	11	367
2360	9	Hydro	30	6	6	200
1690	10	Hydr	30	5	5	167
1691	11	Weight	30	12	12	400
1692	12	Weight	30	8	8	267
1693	13	Weight	30	8	8	267
1694	14	Weight	30	10	10	333
1695	15	Weight	30	11	11	367
1696	16	Wax	30	13	13	433
1697	17	Wax	30	9	9	300
1700	1	Exterior	30	60	80	2,667
1701	2	Exterior	30	65	77	2,567

Avg	321	High	533
Low	133	SD	111.7
Avg	183	High	200
Low	167	SD	16.7
Avg	327	High	400
Low	267	SD	53.3
Avg	367	High	433
Low	300	SD	66.7
Avg	2,617	High	2,667
Low	2,567	SD	50.0

Total Adjusted Raw Count 137  
 Total CFU/m<sup>3</sup> 5,300



Table #2  
**USSA Center of Excellence ATR**  
 03/30/2020 In-treatment Surface Sample Results – CFU/cm<sup>2</sup>

In-treatment 03/30/2020 - USSA Center of Excellence - ATR					
Room	Swab Number	Surface Swab Sample Location	10x10x10 cm	Raw Count	CFU/cm <sup>2</sup>
N/A	CTRL	Swab not removed from container	0	0	0
Surface	1	Training table	10x10x10	650	6.5
Surface	2	Counter/left of sink	10x10x10	825	8.3
Surface	3	Shuttle MVP seat	10x10x10	425	4.3
Surface	4	Training table - Moved out of the building	N/A	-	-
Surface	5	Doctors table	10x10x10	185	1.9
Surface	6	Lg kettle bell	10x10x10	165	1.7
Surface	7	Hydro handrail	10x10x10	245	2.5
Surface	8	1st bike/schwinn	10x10x10	175	1.8
Surface	9	Force plate	10x10x10	90	0.9
Surface	10	2nd red bench	10x10x10	190	1.9

Avg 3.3    Max 8.3  
 Min 0.9    SD 2.39

Total Adjusted Raw Count **2,950**  
 Total CFU/cm<sup>2</sup> **30**

Table #2, continued  
**USSA Center of Excellence ATR**  
 10/22/2019 Pre-treatment Surface Sample Results – CFU/cm<sup>2</sup>

Pre-treatment 10/22/2019 - USSA Center of Excellence - ATR					
Room	Swab Number	Surface Swab Sample Location	10x10x10 cm	Raw Count	CFU/cm <sup>2</sup>
N/A	CTRL	Swab not removed from container	0	0	0
Surface	1	Training table	10x10x10	5,500	55.0
Surface	2	Counter/left of sink	10x10x10	8,650	86.5
Surface	3	Shuttle MVP seat	10x10x10	4,250	42.5
Surface	4	Training table	10x10x10	7,550	75.5
Surface	5	Doctors table	10x10x10	3,900	39.0
Surface	6	Lg kettle bell	10x10x10	3,250	32.5
Surface	7	Hydro handrail	10x10x10	4,100	41.0
Surface	8	1st bike/schwinn	10x10x10	3,750	37.5
Surface	9	Force plate	10x10x10	2,150	21.5
Surface	10	2nd red bench	10x10x10	3,600	36.0

Avg 46.7    Max 86.5  
 Min 21.5    SD 19.05

Total Adjusted Raw Count **46,700**  
 Total CFU/cm<sup>2</sup> **467**



Table #3  
**USSA Center of Excellence ATR**  
 03/30/2020 In-treatment Air Sample Pictures

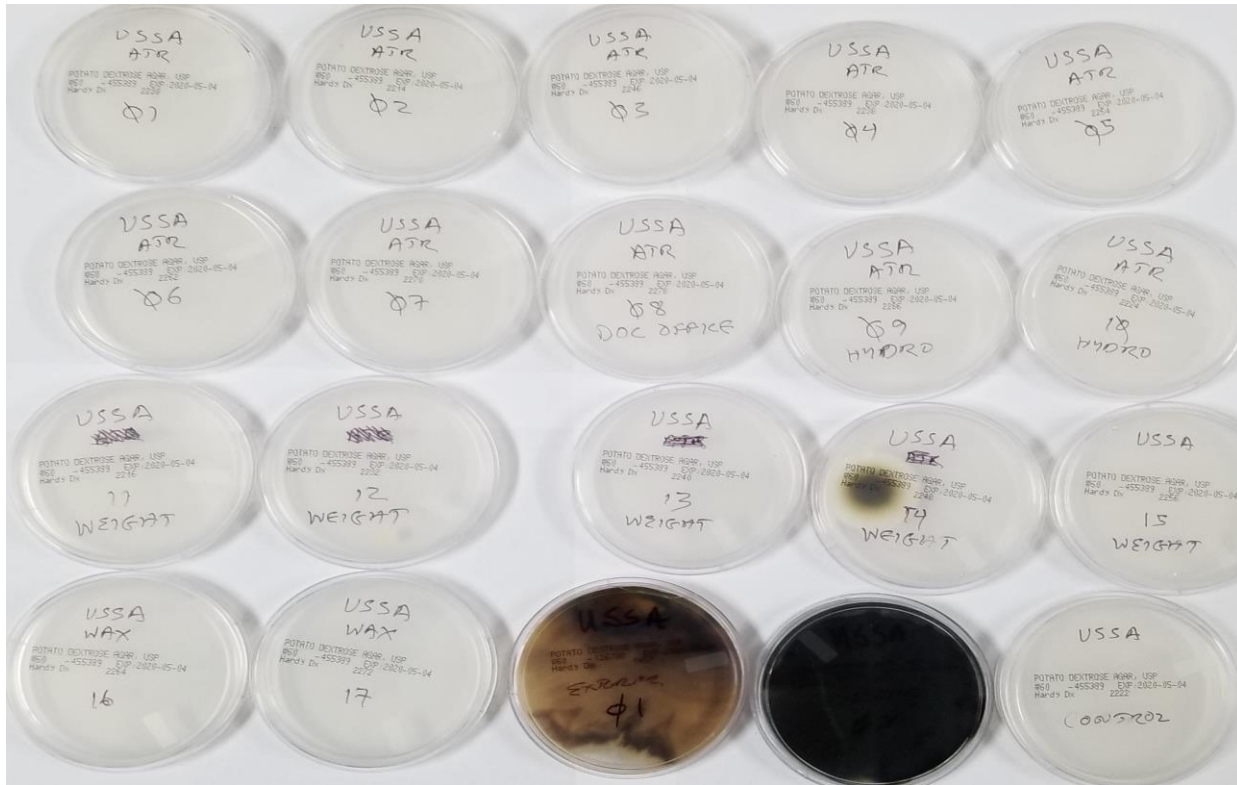


Table #3, continued  
**USSA Center of Excellence ATR**  
 10/22/2019 Pre-treatment Air Sample Pictures

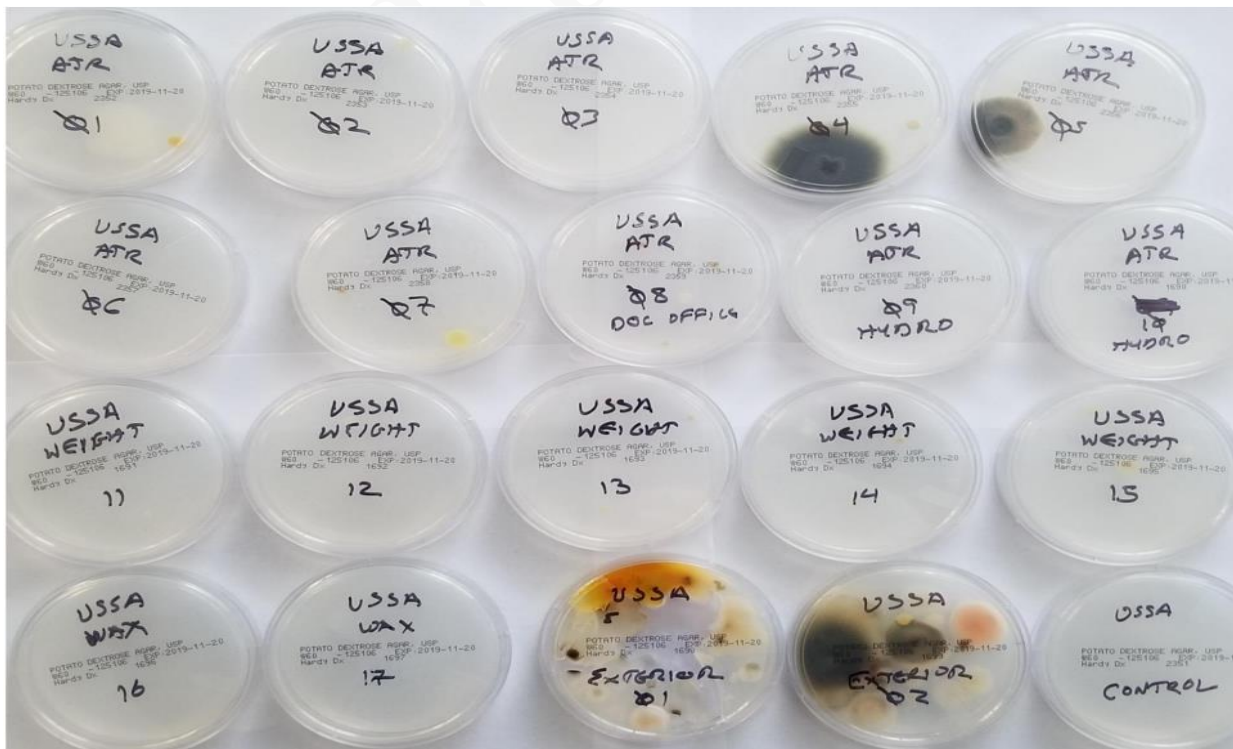




Table #4  
**USSA Center of Excellence ATR**  
 03/30/2020 and 10/22/2019 Pre and In-treatment Air and Surface Swab Locations

