



CASE STUDY

ELEMENT AIR™ SOLUTION REDUCES
MICROBIALS, PARTICULATES, AND VOCs
FOR CANNABIS CULTIVATION FACILITY

OVERVIEW

SUMMARY

In March 2019, Skinny Pineapple installed Element Air's PHI + Tower, RGF's Hepa Filter and Element Air's Carbon Filter systems. The research project goal was to significantly reduce odors associated with late flower terpene production and volatile organic compounds (VOCs). Within 24 hours of equipment installation, the facility experienced a dramatic reduction in unwanted airborne VOCs, microbials, and particulates. Third-party labs confirmed an 85% reduction in total VOCs and a 99.97% particulate filtration to remove microbials and particulates.

SKINNY PINEAPPLE



THE FACILITY

Skinny Pineapple is a commercial cannabis cultivation facility located in Lafayette, Colorado. Known in the cannabis world as The Farm, a well-regarded craft cannabis brand in production since 2015, Skinny Pineapple employs sustainable growing practices, including the use of biologicals. In order to maintain an optimal growing environment, Skinny Pineapple has implemented a comprehensive sanitation and integrated pest management (IPM) strategy to ensure clean, homogeneous environmental conditions.

Because the cultivation facility is located within an office and industrial park, the ownership and management are keenly aware of any odors generated during the cultivation process and how they could trigger complaints from surrounding businesses. As such, odor control is a top priority.

As an innovator in cannabis cultivation, Skinny Pineapple regularly tests and deploys new service and product offerings aimed at improving the health of the facility, employee safety, and maintaining goodwill with local businesses. Both the ownership and the head cultivator are engaged in product evaluation with the goal of providing a consistently high-quality, safe product for both medical patients and adult-use customers.

THE TEST



TESTING FOR MICROBIALS, PARTICULATES, AND VOLATILE ORGANIC COMPOUNDS (VOCs)

In March 2019 at the recommendation of urban-gro, Inc., Skinny Pineapple installed a combination Element Air PHI + Wall Mount Tower + RGF HEPA Filter + Element Air Carbon Filter system. This combined solution—dubbed the “Trifecta of Microbial and VOC/Odor Purification”—helps mitigate microbials and VOCs and promotes odor control.

Prior to installation, the urban-gro and Element Air team established a baseline of VOCs present in the test room measuring 26 feet by 32 feet by 22 Feet. The test room includes 130 plants / 25 1000 watt lights and utilizes a five-ton HVAC Roof unit feeding directly into room.

Element Air and RGF utilized three core technologies (Advanced Oxidation, HEPA, and Activated Carbon) in tandem to achieve the best results possible. The Element Air Tower provided advanced oxidation as the primary defense against VOCs, microbials, and pathogens.

THE RESULTS



THIRD-PARTY LABORATORY RESULTS

In April 2019, testing of the air purification and odor control protocols commenced at Skinny Pineapple. As a result of using the Element Air and RGF technologies, Skinny Pineapple experienced a dramatic lowering of unwanted airborne VOCs.

Confirmed by a third-party laboratory via air sampling and testing, the report reflected an 85% reduction in total volatile organic compounds over a 20-hour period. Specifically, these common cannabis terpenes were systematically reduced: Alpha-Pinene was reduced 100%; beta-Myrcene was reduced 82%; and D-Limonene was reduced 87% over the same 20-hour period.

Additionally, the Element Air HEPA provided 99.97% particulate filtration to remove microbials and particulates. The Element Air Carbon provided additional protection, filtering out even more VOCs from the air.

SAMPLE	TIME AFTER RGF UNITS STARTUP (hr)	ALPHA-PINENE (ug/m3)	BETA-MYRCENE (ug/m3)	D-LIMONENE (ug/m3)	TOTAL VOCs FROM LIBRARY SEARCH (ug/m3)
1	0	16	370	120	590
2	1	15	370	120	590
3	2	14	310	100	490
4	19	5.8	78	0	110
5	20	0	66	16	87
	Percent Reduction	100%	82%	87%	85%

All air samples were collected using stainless-steel canisters under a vacuum. The canisters were then analyzed by a nationally accredited lab with Gas Chromatography/Mass Spectrometry (GC/MS).

CONCLUSION

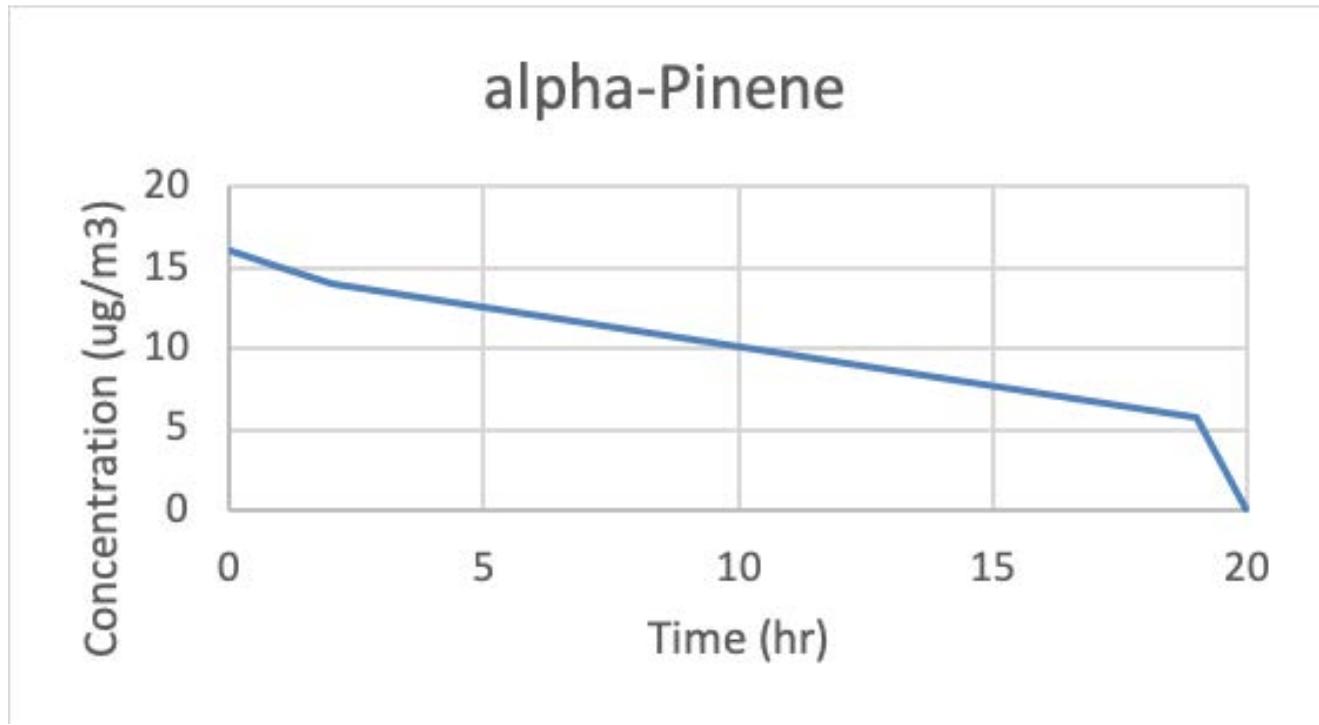


STUDY CONCLUSION

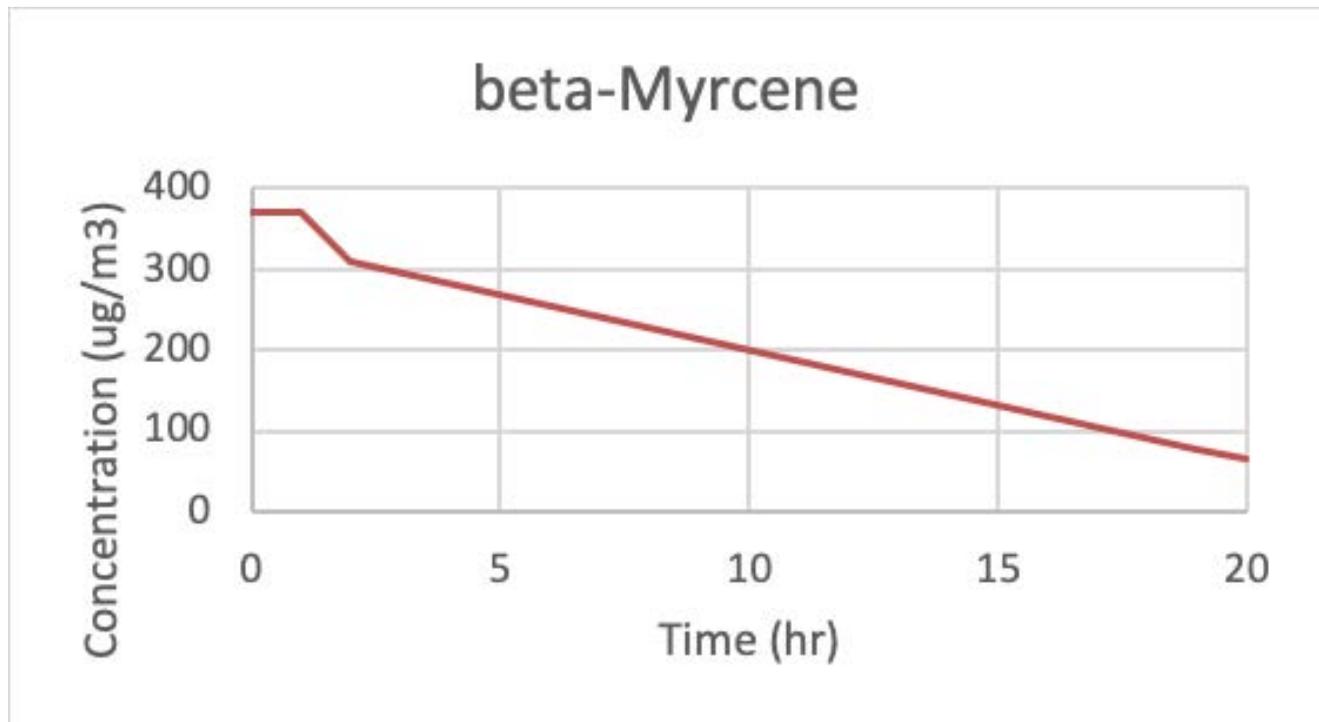
As confirmed by the test results, Skinny Pineapple successfully reduced airborne VOCs, microbials, particulates, and odor. According to head cultivator, John Billings, “using the Element Air solution as a part of my overall integrated pest management (IPM) program has been effective in optimizing my grow environment. urban-gro’s IPM program evolves over time to keep up with changing regulations and pest practices, ensuring effective and compliant pest mitigation.”

For more information on Element Air, urban-gro, or to request a copy of the test results, please email marketing@urban-gro.com.

THE DATA



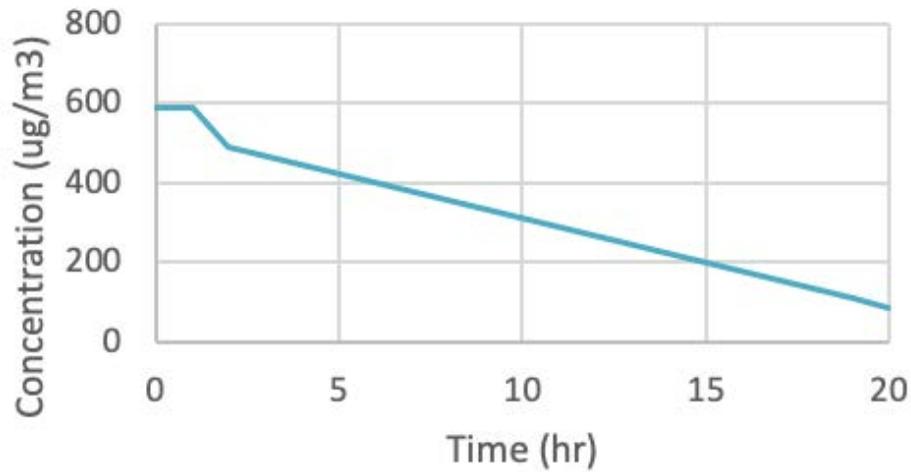
Alpha-Pinene was reduced 100%



Beta-Myrcene was reduced 82%

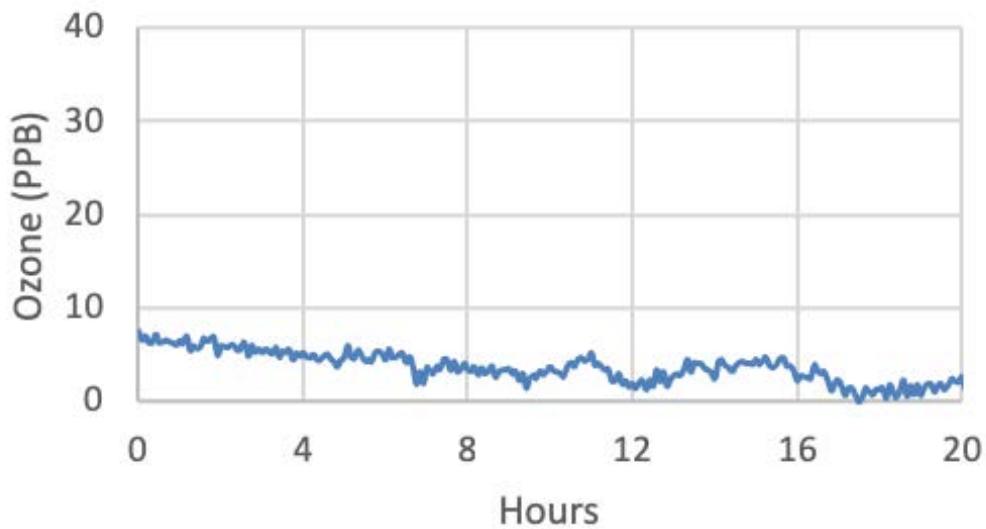
THE DATA

Total Volatile Organic Compounds from Library Search



85% reduction in total VOCs over a 20-hour period

Ozone Level in Flowering Room



Ozone levels remained below 5 ppb over most of the 20 hrs which equates to statistically negligible.

THE DATA



D-Limonene was reduced 87%

TESTING INFORMATION



THIRD-PARTY SAMPLING LOCATION

Skinny Pineapple
1265 Rock Creek Circle, Unit A
Lafayette, CO 80026
Samples taken within Flowering Room

THIRD-PARTY SAMPLING VERIFICATION

urban-gro, Inc.

THIRD-PARTY LAB SERVICE

EMSL Analytical, Inc.

THIRD-PARTY LAB

LA Testing
5431 Industrial Drive, Huntington Beach, CA 92649

RGF UNITS

1 Whole Home Hepa
1 Floor Mounted Tower
1 Carbon Drum

PROTOCOL

METHOD REFERENCE

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b) Includes Library Search

TESTING PROTOCOL

- Prior to air treatment by RGF, collect initial air sample using the lab supplied stainless steel canister.
- Position Hepa, Tower, and Carbon Drum into Flowering Room and turn on units. Take several air samples over the next day with the units running continually.

urban-gro[®]

Element Air[™]

A Division of RGF Environmental Group, Inc.