

**DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Self Initiated Inspection**

B163349628

FACILITY: Sensient Flavors, Inc.		SRN / ID: B1633
LOCATION: 79 STATE, HARBOR BEACH		DISTRICT: Saginaw Bay
CITY: HARBOR BEACH		COUNTY: HURON
CONTACT: Ryan Armbruster, Environmental Health & Safety Manager		ACTIVITY DATE: 06/26/2019
STAFF: Matthew Karl	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MINOR
SUBJECT: Self Initiated Inspection to determine compliance with PTI Nos. 85-96H, 924-79A, 595-95A, 925-79.		
RESOLVED COMPLAINTS:		

On June 26, 2019, I (Matt Karl) conducted a compliance inspection at Sensient Flavors, Inc. located at 79 State Street, Harbor Beach, Michigan. The purpose of the inspection was to determine compliance with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; Michigan Department of Environment, Great Lakes and Energy, Air Quality Division (EGLE-AQD) Administrative Rules; Permit to Install (PTI) Nos. 85-96H, 595-95A, 925-79 and 924-79A. Mr. Ryan Armbruster, Environment, Health and Safety (EHS) manager assisted during the inspection and provided requested records.

Facility Description:

Sensient Flavors, Inc. produces beverage flavors, BioNutrient products, fragrance compounds and ingredients, natural ingredients as well as sweet and savory flavors. All of these products are different types of hydrolyzed vegetable protein (HVP) and are produced from corn, soy or wheat. Grain unloading, storage silos and transfer to reactor tanks are controlled by a dust collector system. There are several types of reaction processes that are undertaken depending on the type of product desired. The raw feeds are turned into a slurry and are then processed through an acidic hydrolysis reactor to break vegetable proteins into their amino acid constituents. Generally, this process involves adjusting the temperature, pressure and pH of the mixture in different tanks.

Some products undergo fermentation. Depending on the product being produced the HVP can be further treated through a neutralization process, filter presses to remove unwanted solids and are either sold as liquids or are further processed through spray dryers and cyclones and are sold as solids. Energy for the production process is provided by two natural gas fired boilers.

Site Inspection:

I arrived on site at approximately 1:20 pm. After signing in at the front desk, I met with Ryan Armbruster, EHS Manager. Ryan provided me with the following recordkeeping binders:

- Sensient Harbor Beach Scrubber Log Worksheet
- Sensient HTA Scrubber Logs 2018
- Sensient Baghouse Scrubber Logs 2018
- Sensient HVP Spray Dryer Scrubber
- Sensient Savory Scrubber Logs 2018

I've included a description of the records contained in each of these binders below.

Sensient Harbor Beach Scrubber Log Worksheet:

The "Sensient Harbor Beach Scrubber Log Worksheet" binder contained records related to flexible group FGHPHCLNEUHTA; specifically, the HVP reactor room packed bed scrubber (the control for EUHVPREACTORS) and the neutralization tank packed bed scrubber system (the control for EUNEUTANKS). I reviewed records from 5/1/19 through 6/24/19 for these packed bed scrubber systems.

For the EUHVPREACTOR packed bed scrubber, the average minimum pH recorded was approximately 10, the average minimum flow was approximately 100 gallon per minute (gpm); the maximum differential pressure was approximately 2 inches water column (" W.C.). These readings appeared to follow the design/equipment parameters (SC IV.1.) for the EUHVPREACTOR packed bed scrubber, which requires a minimum flow rate of 30 gpm, pH at or above 6; a maximum differential pressure of 6" W.C.

For the EUNEUTANKS packed bed scrubber, the average minimum pH recorded was approximately 9, the average minimum flow was approximately 11 gpm; the maximum differential pressure was approximately 2" W.C. These readings appeared to follow the design/equipment parameters (SC IV.2.) for the EUNEUTANKS

packed bed scrubber, which requires a minimum flow rate of 8 gpm, pH at or above 6; a maximum differential pressure of 6" W.C.

The "Sensient Harbor Beach Scrubber Log Worksheet" also contained daily visible emission records for the HVP reactor room packed bed scrubber. The visible emissions were conducted by a USEPA method 9 certified operator. The maximum visible emission observation over the period of the records reviewed was 5% opacity.

Sensient HTA Scrubber Logs 2018:

The "Sensient HTA Scrubber Logs 2018" binder contained records related to flexible group FGHVPHCLNEUHTA; specifically, the new HTA treatment room scrubber (the control for EUHTA2). Ryan Armbruster informed me that EUHTA1 was shut down a couple years ago. I reviewed records from 4/29/19 through 6/23/19 for the HTA treatment room scrubber.

For the EUHTA2 scrubber, the minimum pH recorded was approximately 7, the minimum flow was approximately 35 gpm; the maximum differential pressure was approximately 0.2" W.C. These readings appeared to follow the design/equipment parameters (SC IV.5.) for the EUHTA2 scrubber, which requires a minimum flow rate of 20 gpm, pH at or above 5; a maximum differential pressure of 6" W.C.

Daily visible emission records for the EUHTA2 scrubber were conducted by a USEPA method 9 certified operator. The visible emission observations over the period of the records reviewed were all 0% opacity.

Sensient Baghouse Scrubber Logs 2018:

The "Sensient Baghouse Scrubber Logs 2018" binder contained records related to flexible group FGGRAINSODA, specifically, the dust collector system for grain handling operations. I reviewed records from 12/31/18 through 6/23/19. Over this period the average differential pressure was approximately 0.5" W.C. These readings appeared to follow the malfunction abatement plan (MAP) differential pressure range of 0.5 to 5" W.C.

Sensient HVP Spray Dryer Scrubber:

The "Sensient HVP Spray Dryer Scrubber" binder contained records related to flexible group FGS AVFLAV, specifically, the savory flavors spray dryer venturi scrubber. I reviewed records from 4/30/19 through 6/24/19. During this time period, the minimum flow was approximately 102 gpm (average was ~112 gpm); the maximum differential pressure was approximately 0.26" W.C. (average was ~0.13" W.C.). The maximum daily visible emission record observed by a USEPA method 9 certified operator over this time period was 5% opacity. The log itself specifies the normal operating ranges for flow are 85-115 gpm, and less than 0.5" W.C. for differential pressure. The MAP indicates that minimum flow should be at or above 50 gpm and differential pressure should be less than 15" W.C. The records reviewed appeared to be following both of these ranges.

Sensient Savory Scrubber Logs 2018:

The "Sensient Savory Scrubber Logs 2018" binder contained records related to flexible group FGS AVFLAV, specifically, the savory reactions packed bed scrubber. I reviewed records from 4/29/19 through 6/16/19. During this time period, the pH ranged from 7.51-7.8, the flow rate ranged from 240-250 gpm and the differential pressure ranged from 1.1-1.8" W.C. The visible emission observations over the period of the records reviewed were all 0% opacity. The MAP specifies the pH should be between 7.5 and 9.5, the minimum flow rate should be at or above 235 gpm and the differential pressure should be between 0.25 and 2.5" W.C. The records reviewed appeared to be following these ranges.

After reviewing the recordkeeping binders, Ryan Armbruster went and inspected the controls in the facility. The facility is a clean room environment so before entering I donned a hairnet, protective glasses, earplugs, a white lab coat, and boot covers.

First, we inspected the savory flavors spray dryer venturi scrubber (FGS AVFLAV). At the time of our observation, the differential pressure reading was 2" W.C. and the flow rate was 58 gpm. This appeared to be following the MAP differential pressure of less than 15" W.C. and minimum flow rate of 50 gpm.

Next, we reviewed the savory reactions packed bed scrubber (FGS AVFLAV). At the time of our observation at approximately 3:45 pm, the differential pressure was 1.8" W.C., the flow rate was 240 gpm and the pH reading was 7.30. The MAP specifies that the flow rate should be at or above 235 gpm and the differential pressure should be between 0.25-2.5" W.C. and the pH should be between 7.5-9.5. It appears that the pH was low. According to the MAP, sodium hydroxide should be added to the scrubber recirculation tank and the pH sensors should be checked. I followed up with Ryan Armbruster and he was able to provide me with the scrubber log records for the week of 6/24 through 6/28. The log noted that the pH of the recirculation tank was within the MAP

plan limits prior to start-on 6-26-2019 and the pH was adjusted back within the MAP plan range prior to start up on 6-27-2019. The normal operating hours for this area are from 7:00 AM – 3:00 PM so at the time of the observation of the pH reading, the process controlled by the scrubber was not operating and no emissions were being sent to the scrubber.

We then proceeded to the HTA production treatment room scrubber (EUHTA2). At the time of our observation, the differential pressure drop was 0.2" W.C., the flow rate was 41 gpm and the pH was 7.82. This appeared to be following FGHVPHCLNEUHTA SC IV.5. which requires a minimum flow rate of 20 gpm, pH at or above 5; a maximum differential pressure of 6" W.C.

Next, we reviewed the neutralization tank packed bed scrubber system (EUNEUTANKS). At the time of our observation, the flow rate was 11 gpm, the pH was 7.82 and the differential pressure drop was 3.4" W.C. This appeared to be following FGHVPHCLNEUHTA SC IV.2. which requires a minimum flow rate of 8 gpm, pH at or above 6; a maximum differential pressure of 6" W.C.

We reviewed the HVP reactor room packed bed scrubber system (EUHVPREACTORS). At the time of our observation, the flow rate was 103 gpm, the pH was 9.99 and the differential pressure drop was 1.3" W.C. This appeared to be following FGHVPHCLNEUHTA SC IV.1. which requires a minimum flow rate of 30 gpm, pH at or above 6; a maximum differential pressure of 6" W.C.

Finally, we checked the dust collector system (FGGRAINSODA). The facility was not accepting grain or soda ash at the time of my inspection, so there was no differential pressure to observe.

Ryan Armbruster and I had a brief post-walkthrough discussion about the inspection. Ryan informed me that they have not received odor complaints recently at the facility. I departed the facility at approximately 4:30 pm.

Records Review:

At the time of my inspection, I received the following records from Ryan Armbruster:

- USEPA Method 9 Certifications
- 2018 Material Records
- 2019 Material Records
- 2018 Deviation Log
- 2019 Deviation Log

On Tuesday (7/9/2019) I received the following records via email from Ryan Armbruster:

- 2019 SD Rolling Average REV 7-01-2019.xlsx
- BAG House PM Schedule.pdf

As part of my records review, I also reviewed:

- Air Emissions 2018 REV2.xlsx

I've included a description of the findings of the records review of each of those documents below.

The "USEPA Method 9 Certifications" record showed that seven (7) Sensient Flavors, Inc. staff members received training that has met the requirements of 40 CFR 60 Appendix A, Reference Method 9, as amended, and is certified in accordance with Reference 9, 40 CFR 60 Appendix A, as a Visible Emissions Reader for a period of six (6) months. All staff members received the training from Compliance Assurance Associates, Inc. on 3/18/19.

I've included a summary of the "2018 Material Records" in the table below:

Month-Year	Savory Product 12-month rolling total (lb/yr)	Flavor Product 12-month rolling total (lb/yr)
January-2018	260,021	19,336
February-2018	265,640	24,215
March-2018	256,020	32,656
April-2018	245,433	43,098
May-2018	233,713	48,565
June-2018	233,034	57,190
July-2018	219,939	68,077
August-2018	219,297	72,774
September-2018	207,435	81,849

October-2018	200,628	87,526
November-2018	191,353	95,142
December-2018	179,471	98,006

The Savory Product 12-month rolling totals for 2018 were all below the material limit specified in PTI No. 85-96H FGSAVFLAV SC II.1. of 290,400 lb/yr. The Flavor Product 12-month rolling totals for 2018 were all below the material limit specified in PTI No. 85-96H FGSAVFLAV SC II.2. of 237,600 lb/yr.

I've included a summary of the "2019 Material Records" and "2019 SD Rolling Average REV 7-01-2019.xlsx" records in the table below:

Month-Year	Savory Product 12-month rolling total (lb/yr)	Flavor Product 12-month rolling total (lb/yr)
January-2019	182,846	100,252
February-2019	171,800	103,142
March-2019	164,355	105,746
April-2019	158,760	99,722
May-2019	155,308	94,761
June-2019	154,583	94,578

The Savory Product 12-month rolling totals for 2019 to date were all below the material limit specified in PTI No. 85-96H FGSAVFLAV SC II.1. of 290,400 lb/yr. The Flavor Product 12-month rolling totals for 2019 to date were all below the material limit specified in PTI No. 85-96H FGSAVFLAV SC II.2. of 237,600 lb/yr.

I used the Flavor Product 12-month rolling total to calculate the VOC emissions from EUSAVFLAVGDRY. The flavor product contains alcohols, which is why VOCs are calculated by the amount of this product produced. I used stack test data from 6/10/2014 for the dryer VOC emissions of 1.72 lbs/hr. The emission factor was expressed as a lb VOC emission / lb flavor product by dividing the stack test VOC emissions by the pound per hour dryer capacity of 104 lbs/hr. This results in a VOC emission factor for the EUSAVFLAVGDRY of 0.017 lb VOC/ lb flavor product. I've included the resultant VOC emissions for EUSAVFLAVGDRY for 2018 and 2019 to date in the table below:

Month-Year	Flavor Product 12-month rolling total (lb/yr)	VOC Emission 12-month rolling total (TPY)
January-2018	19,336	0.16
February-2018	24,215	0.20
March-2018	32,656	0.27
April-2018	43,098	0.36
May-2018	48,565	0.40
June-2018	57,190	0.47
July-2018	68,077	0.56
August-2018	72,774	0.60
September-2018	81,849	0.68
October-2018	87,526	0.72
November-2018	95,142	0.79
December-2018	98,006	0.81
January-2019	100,252	0.83
February-2019	103,142	0.85
March-2019	105,746	0.87
April-2019	99,722	0.82
May-2019	94,761	0.78
June-2019	94,578	0.78

The 12-month rolling totals for VOC emissions from EUSAVFLAVGDRY for 2018 and 2019 to date were all well below the emission limit specified in PTI No. 85-96H FGSAVFLAV SC I.1. of 18.5 tons per year (TPY).

I reviewed the "2018 Deviation Log" record. There were four (4) deviations noted in the 2018 log. From 2/3 to 2/4/18 the flow rate was below the MAP plan limit for the Savory Spray Dryer Scrubber. The low flow rate was caused by the rotometer having product stuck to it. The build up was removed and flow rate was restored to the normal range. The other three (3) deviations were odor complaints on 3/4/18, 5/13/18, 6/20/18 for the HVP Spray Dryer. The odors were short term and were addressed by adjusting the amount of de-odorizer used.

I reviewed the "2019 Deviation Log" record. There was one (1) deviation noted in the 2019 log to date. From 3/25 to 3/29/19 the recorded flow rate was below the limit in the savory reactions area.

I reviewed the "BAG House PM Schedule.pdf" record for the FGGRAINSODA dust collector system. The facility follows the manufacturer specifications for filter cartridge replacement, which ranges from 3 months to 1 year. The facility inspects the bin vent, compressed air system, and magnehelic daily, the filter cartridges weekly and the bin vent assembly monthly.

Summary:

Based on my site inspection and records review, it appears that Sensient Flavors, Inc. was in compliance with PTI Nos. 85-96H, 595-95A, 925-79 and 924-79A.

NAME Matthew R. Kurl

DATE 7/23/19

SUPERVISOR C. Gore