UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604

DATE:	***February 23, 2021***
SUBJECT:	CLEAN AIR ACT INSPECTION REPORT PHM Brands, LLC, Michigan City, Indiana
FROM:	Emma Leeds, Environmental Engineer AECAB (IL/IN)
THRU:	Constantinos Loukeris, Acting Section Chief AECAB (IL/IN)
TO:	File

BASIC INFORMATION

Facility Name: PHM Brands, LLC

Facility Location: 1700 East US 12, Michigan City, Indiana

Date of Inspection: 1/12/2021

EPA Inspector(s):
1. Emma Leeds, Environmental Engineer
2. Karina Kuc, Environmental Scientist
3. Daniel Heins, Environmental Scientist

Other Attendees:
1. Darin Salyer, Regional Oil Engineer – PHM Brands, LLC
2. Tim Kinsley, Senior Consultant and Engineer – Mostardi Platt
3. Stuart Burton, Project Manager – Mostardi Platt
4. Dan Kossack, Engineer – Mostardi Platt
5. Ryan Simon, Engineer – Mostardi Platt
6. Steve Friend, Environmental Engineer – Indiana Department of Environmental Management (IDEM)

Contact Email Address: Darin.Salyer@phmbrands.com

Purpose of Inspection: To observe hazardous air pollutant stack testing in compliance with the CAA.

Facility Name: PHM Brands, LLC
Facility Location: 1700 East US 12, Michigan City, IN
Date of Inspection: January 12, 2021

Facility Type: CBD Extraction

Arrival Time: 8:00 AM
Departure Time: 11:00 AM

Inspection Type:
☐ Unannounced Inspection
☒ Announced Inspection

OPENING CONFERENCE

☒ Presented Credentials
☒ Stated authority and purpose of inspection
☐ Provided Small Business Resource Information Sheet
☒ Small Business Resource Information Sheet not provided. Reason: Not applicable to inspection.
☐ Provided CBI warning to facility

The following information was obtained verbally from Darin Salyer unless otherwise noted.

Company Ownership: PHM Brands, LLC purchased the facility from Prinova, USA in June 2018. Viobin is a company owned by PHM Brands, LLC.

Process Description:
Production begins with either raw hemp or pelletized hemp delivered to the site and pumped to the extractor. The hemp is mixed with hexane solvent in an enclosed and continuous process with a residence time of approximately 30 minutes. The extractor generates a spent hemp material and a mixture of hexane and extracted hemp oils. The spent hemp is sent to a toaster, which heats the hemp, removing any remaining volatiles. There are six decks within the toaster and the hemp moves from the top to the bottom, with a vent for each deck that sends emissions to a condenser and then to the mineral oil scrubber. By the time the hemp reaches the bottom deck, no solvent should remain. An air pump is used to remove the final dry spent hemp from the bottom of the toaster and put it into bags. The final dry hemp is currently being stored outside at the facility.

The mixture of hexane and extracted oils goes from the extractor to separation columns, where heat is used to separate hexane from the intermediate product. The hexane is routed to a condenser for reuse onsite. “Paste”, a mixture of the extracted oils and impurities from the hemp, exits the separation columns and is mixed with ethanol. This mixture is put into drums for the “winterization” process, in which drums are placed in freezers for 48 hours to separate desired oils from waste. The mixture of oils and ethanol is passed through a 1-micron filter into a tank. Ethanol is evaporated out for re-use, and what remains is “winterized crude” hemp oil.

Further processing is performed on the "winterized crude" hemp oil to create an 80% cannabidiol (CBD) distillate and an isolate, pure CBD powder. All three CBD products are sold in bulk by PHM Brands.

Other operations occur on site in support of the Viobin facility, but do not have air emissions.

Staff Interview: The facility was closed for three weeks for the holidays, reopening on Monday, January 11, 2021, the day before our inspection. Starting after the break, PHM began processing pelletized hemp rather than raw hemp for the first time. The switch from raw hemp to pelletized hemp allows for an increase in production from 900 – 1,000 pounds (lbs) of hemp/hour to 2,500 lbs of pelletized hemp/hour.

PHM purges the system with air after every batch, which occurs approximately every day and a half. The system was purged from 3 AM – 6 AM on the day of the inspection. It takes the system 2 – 3 hours to stabilize, which PHM indicated causes some fluctuations in the initial hexane stack test concentrations.

Early stages of construction for a flour packaging facility have begun in the western-most section of the site.

TOUR INFORMATION

EPA Tour of the Facility: Yes

Data Collected and Observations:
Before EPA personnel arrived on site, Steve Friend (IDEM) identified a deviation of the calibration process from EPA Method 7E that prevented stack testing from being conducted for the day. EPA Method 7E provides guidance for conducting stack tests in which the stack gas must be diluted for measurement. The method calls for calibration gas to span the actual undiluted concentrations of the relevant emission, in this case total hydrocarbon (THC), with the calibration gas diluted in the same manner as the stack gas itself. Instead, Mostardi Platt was using calibration gas concentrations that only spanned the diluted THC concentration range rather than the actual undiluted THC concentration range. The highest propane standard available to Mostardi Platt on-site was 9,360 parts per million (ppm) while the inlet THC concentration was detected as high as approximately 350,000 ppm. Mostardi Platt needs at least several weeks to obtain the required standard of calibration gas.

Although the stack test was postponed, inlet and outlet concentrations were observed for a few hours to get a general idea of the emission concentrations and to observe how changing variables within the system might impact hexane emissions. Variables adjusted by Darin Slayer included the mineral oil temperature (increased from 210° F to 220° F), fan speed (increased from 800 rotations per minute [rpm] to 950 rpm), and air flow. Live numbers typically hovered from 96% - 98% control efficiency, and the one-hour average was 97.3%. The scrubber inlet averaged 60 lbs hexane/hour and 150,000 ppm hexane, while the scrubber outlet averaged 1.6 lbs hexane/hour and 4,000 ppm hexane. The permit calls for a 98% control efficiency.

Despite increasing the hexane addition rate to 9 gallons per minute (gal/min) from the 6 gal/min in the previous September 2020 stack test, the inlet scrubber hexane results remained around 60 lbs hexane/hour for both tests, raising the question of a possible hexane leak in the system. Viewing the toaster with a forward looking infrared (FLIR) camera revealed possible hydrocarbon emissions near the steam ducts and level control systems that could indicate a hexane leak, however, due to technical issues, the video is unrecoverable. Darin Slayer postulated that these emissions were just steam created from the heat of the toaster. The toaster leaks detected during the last inspection were not observed. PHM stated that they had replaced the gaskets since the last inspection.

Photos and/or Videos: were not taken during the inspection.

Field Measurements: were not taken during this inspection.

CLOSING CONFERENCE

☒ Provided U.S. EPA point of contact to the facility

Compliance Assistance: Steve Friend (IDEM) advised Mostardi Platt on Method 7E – Determination of Nitrogen Oxides Emissions from Stationary Sources.

Concerns: Based on observations of the unofficial stack testing results, the scrubber system does not seem to consistently meet the required 98% control efficiency. There also appears to be a hexane leak in the system, possibly at the toaster.

SIGNATURES

X Leeds, Emma

Digitally signed by Leeds, Emma
Date: 2021.02.23 17:28:23 -06'00'

Emma Leeds
Report Author

X CONSTANTINOS LOUKERIS

Digitally signed by CONSTANTINOS LOUKERIS
Date: 2021.03.02 15:39:51 -06'00'

Constantinos Loukeris
Acting Section Chief