

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: On-site Inspection

B887370507

FACILITY: High Life Farms		SRN / ID: B8873
LOCATION: 624 W BRADY ST, CHESANING		DISTRICT: Bay City
CITY: CHESANING		COUNTY: SAGINAW
CONTACT: Hunter Knapp , Extraction Manager		ACTIVITY DATE: 01/09/2024
STAFF: Gina McCann	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MINOR
SUBJECT: inspection of PTI 32-23		
RESOLVED COMPLAINTS:		

I performed an announced inspection of Highlife Farms (B8873) to determine compliance with PTI 32-23. At the time of the inspection the facility was in compliance with PTI 32-23.

In October of 2021 the Environmental Support Division received an email from Lawrence Township regarding the use of odor mitigation at the farm. The township was inquiring if the odor suppression system was required to be permitted. Upon further internal conversations with subject matter experts a self-initiated inspection was scheduled to determine if additional equipment was installed that would require permitting. Subsequently, the facility determined a permit was needed for oil extraction equipment and two (2) diesel fired emergency generators. PTI 32-23 was issued February 23, 2023 to resolve violations related to R201. This inspection was to determine compliance with that permit.

The facility has repurposed an existing, industrial building to use in the manufacturing of marihuana for recreational and medical consumption. The farm employs (250) two hundred and fifty employees and delivered its first product April 20, 2018. There is a total of (8) eight flower rooms and a greenhouse with (3) three bays. Each flower room can hold 800-900 plants and each bay on the greenhouse will hold approximately 2000 plants.

There is a total of (5) five natural gas fired boilers. The boilers are used to deliver heat through a closed loop system. The plants sit on top of this warm water loop to help deliver the desired warmth for propagation. The interior flower rooms rarely, if ever, use the boiler system. The boilers for these interior rooms are sized as follows: (1) one at 500,000 Btu/hr and (2) two at 399,000 Btu/hr. They have less influence from the outside environment and the grow lights provide the necessary heat needed. The greenhouse, however, has a greater potential to be influenced by the outside weather. Therefore, this boiler system is regularly used to moderate the temperature the plants need. There are two boilers for the greenhouse, and they are each sized at 999,000 Btu/hr. AP-42 emissions factors were used to calculate significance values. The table below is taken from the PTI application where the boilers were determined to be permit exempt.

Table A-3. Natural Gas-Fired Boiler and Space Heater Emissions

Specifications						
Boiler Heat Input Capacity, each (MMBtu/hr)	1					
Number of Boilers	5					
Space Heater Heat Input Capacity, aggregate (MMBtu/hr)	1					
Natural Gas Heating Value (Btu/scf)	1,020					
Hours of Operation (hrs/yr)	8,760					
Pollutant	Emission Factor (lb/MMscf)	Emission Factor Basis	Hourly Emissions 5 Boilers ^{1,2} (lb/hr)	Annual Emissions 5 Boilers ³ (tpy)	Hourly Emissions Space Heaters ¹ (lb/hr)	Annual Emissions Space Heaters ³ (tpy)
NO _x	100	AP-42 Ch. 1.4, Table 1.4-1	0.49	2.1	0.10	0.43
CO	84		0.41	1.8	0.08	0.36
PM (filterable)	1.9		9.3E-03	0.04	1.9E-03	8.2E-03
PM ₁₀ (filterable & condensable)	7.6		3.7E-02	0.16	7.5E-03	3.3E-02
PM _{2.5} (filterable & condensable)	7.6	AP-42 Ch. 1.4, Table 1.4-2	3.7E-02	0.16	7.5E-03	3.3E-02
SO ₂	0.6		2.9E-03	1.3E-02	5.9E-04	2.6E-03
VOC	5.5		2.7E-02	0.12	5.4E-03	2.4E-02
Lead	0.0005		2.5E-06	1.1E-05	4.9E-07	2.1E-06

FGEXTRACT

Two solvent based, cannabis oil, extraction, processes were added in late 2021 and early 2022. EUEXTRACT1 uses a 70% butane to 30% propane ratio and the other uses heptane and ethanol for extraction and clarification of the desired oil. The solvents are washed over the biomass material to break it down, before ultimately removing the desirables from the plant material. The solvent mixture, at low temperature, is charged into the vessel to break down the material, separating the oils from the flower to trim extraction. The oil and solvent vapor move to the surge and collection tanks where the collection tank is heated to separate the solvent from the oil. The desired product (oil) is removed from the base of the collection tank for testing, packaging, and sale. The vapor, consisting of the original butane/propane mixture and potentially small amounts of water vapor (if present in the collection tank due to moisture from the biomass) are pumped from the tank for recovery. Water vapor can be separated using a filter; the butane/propane mixture are run through a heat exchanger to chill the vapor and return the solvent to liquid state. The recovered solvent is reused for the next batch; solvent is replenished as needed (as solvent is lost to the atmosphere from the processing during purging cycles or when the system is opened for changing the material). Because the solvent flow rate is dependent on the cannabis properties, the amount of solvent loss can vary; however, the facility estimates that the maximum butane/propane solvent loss to be up to 20 pounds per run and each run lasts approximately 8 hours.

Special condition (SC) I.1. limits the use of butane/propane consumption to 21,900 pounds per year (lbs/yr) based on a 12-month rolling time period as determined at the end of each month. SC VI.2. is the associated monitoring and recordkeeping requirement that requires the facility to keep on a monthly basis the volume or weight of each solvent used, the VOC content of each solvent, the VOC mass emission calculations, and the VOC mass emission calculations to determine the annual emission rate in tons per 12-month rolling time period. For the 12-month rolling time period ending December 2023, EUEXTRACT1 consumed 4,000 lbs.

EUEXTRACT2 is a winterisation process which uses ethanol and sub-zero temperatures to separate the unwanted fats and waxes from the oil. Ethanol can be recovered and reused almost endlessly, whereas the heptane is spent after being used twice. First, the trim from the cultivation is loaded into bags. The bags are loaded into the reactor, which is then filled with ethanol (each batch comprises up to

about 14-21 pounds of biomass and up to about 30 gallons of ethanol. Each batch lasts for about

1 hour, plus time for preparing the next batch. Each run is approximately 6 to 8 hours, with 5 batches per run.) The vessel agitates the biomass to break it down and separate the oil (as well as other fats, waxes, and other compounds) via centrifugation. As the biomass bags spin, the ethanol and extracted material drain through the base of the vessel; the drained stream (“crude oil”) is filtered to remove undesired material and begin separating the oil and ethanol. The biomass is removed from the vessel where residual ethanol is evaporated, venting to the atmosphere via the fume hood. The crude oil stream (containing some amount of ethanol) is then processed in the rotovap to separate the ethanol from the oil. The ethanol stream is sent through a condenser and collected into a holding tank and held for reuse in future batches. The process has a high recovery, with at least 95% of the ethanol being recovered for reuse. The filtered stream (containing the oil with other compounds, such as carboxylic acids) remaining in the rotovap globe is heated to remove the oil from the vessel and to convert the cannabinoid compounds to the desired form. The decarboxylated stream is then processed at the vacuum ovens (vented to the atmosphere in the fume hoods) to drive off residual solvent and then loaded into the heptane reactor.

SC I.2. limits the use of ethanol and denatured ethanol consumption to 28,126 lbs/yr based on a 12-month rolling time period as determined at the end of each month. SC VI.2. is the associated monitoring and recordkeeping requirement that requires the facility to keep on a monthly basis the volume or weight of each solvent used, the VOC content of each solvent, the VOC mass emission calculations, and the VOC mass emission calculations to determine the annual emission rate in tons per 12-month rolling time period. For the 12-month rolling time period ending December 2023, EUEXTRACT2 consumed 12,112 lbs. SC 3. Limits the consumption of heptane to 6,991 lbs/yr based on a 12-month rolling time period as determined at the end of each month. SC VI.2. is the associated monitoring and recordkeeping requirement that requires the facility to keep on a monthly basis the volume or weight of each solvent used, the VOC content of each solvent, the VOC mass emission calculations, and the VOC mass emission calculations to determine the annual emission rate in tons per 12-month rolling time period. For the 12-month rolling time period ending December 2023, EUEXTRACT2 consumed 628 lbs.

SC III.1. restricts operation of FGEXTRACT unless a malfunction abatement plan (MAP) as described in Rule 911(2), has been submitted within 90 days of permit issuance, and is implemented and maintained. The MAP was approved on June 5, 2023. Maintenance records for each extraction line are housed on a clipboard next to the hood system. Maintenance logs for the past six months were provided and show the facility is in compliance with this requirement.

In addition, the farm has an ice water hash system commonly called bubble hash. No solvents are used in this process and is not part of the flexible group. This process produces a smokable material.

FGENGINES

The farm installed (2) two back-up generators to supply electricity in case of a power outage. Each generator uses diesel and has an 18.1 L displacement (600 kW (910 bhp) diesel-fired emergency generators) and were required to be permitted.

SC III.1., III.2., and III.3., restricts operation of the engines to less than 500 hours per engine per year, 100 hours per calendar year for maintenance checks, and less than 50 hours for non-emergency. All hours are based on a 12-month rolling time period as determined at the end of the calendar month. SC VI.4. is the associated monitoring and recordkeeping requirement that requires the facility to monitor and record, the total hours of operation for each engine in FGENGINES on a monthly and 12-month rolling time period basis, and the hours of operation during emergency and non-emergency service that are recorded through the non-resettable hour meter for engine in FGENGINES, on a calendar year basis, in a manner acceptable to the AQD District Supervisor. The permittee shall document how many hours are spent for emergency operation of each engine in FGENGINES, including what classified the operation as emergency and how many hours are spent for non-emergency operation. For the 12-month rolling time period ending December 2023, each engine operated 17 hours all due to maintenance preparedness checks.

SC III.4. requires the facility to maintain the engines according to manufacturer's emission-related written instructions, if the facility wishes to maintain the allowance to verify emissions through engine certification. The facility provided certification documents for each engine and I verified maintenance according to the manufacturer is being performed. Testing of the engines is not required if this certification is maintained or upon request of the district supervisor.

SC IV.1. requires the facility to maintain each engine with a non-resettable hour meter. EUENGINE1 (serial #3003581809) had 137.0 hours and EUENGINE2 (serial #3005756586) had 111.4 hours.

Lastly, emissions are also controlled by verifying the engines use diesel with no more than 15 ppm (0.0015 percent) sulfur content. The last two supplier certifications verify the engines are using ultra low sulfur diesel.

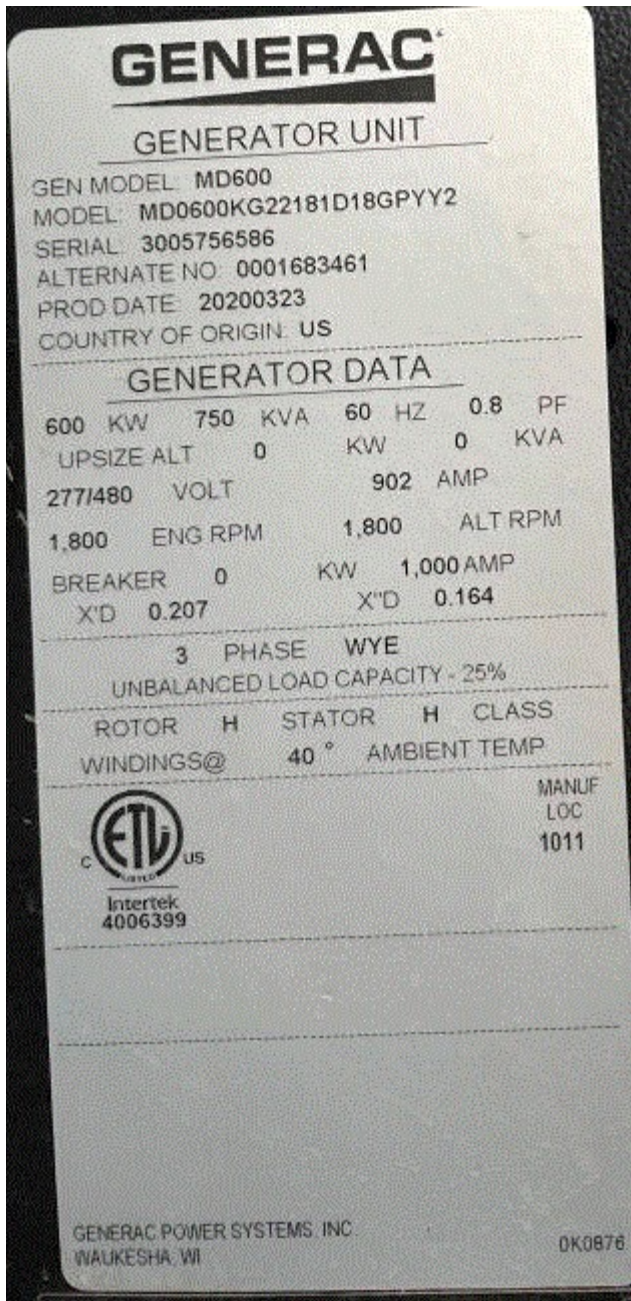


Image 1(EUENGINE2) : Name plate.

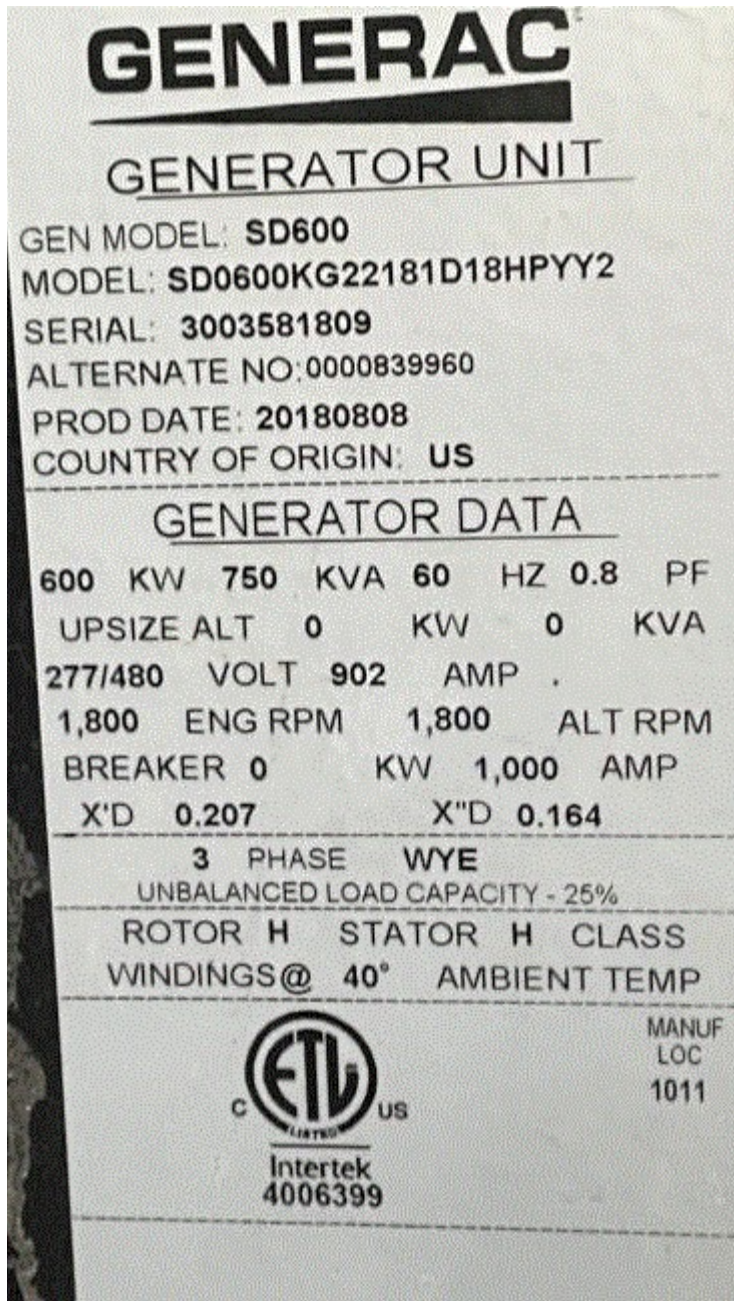


Image 2(EUENGINE1) : Name plate

NAME Dina L. McFarland

DATE 1-19-2024

SUPERVISOR Chris Hare