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

P115769094

FACILITY: Brightmark Willow Point RNG, LLC		**SRN / ID:** P1157
LOCATION: 5301 Flannigan Road, ORLEANS		**DISTRICT:** Grand Rapids
CITY: ORLEANS		**COUNTY:** IONIA
CONTACT: Lillian Burns , Senior Manager, Environmental Compliance		**ACTIVITY DATE:** 09/19/2023
STAFF: Eric Grinstern	**COMPLIANCE STATUS:** Non Compliance	**SOURCE CLASS:** MINOR
SUBJECT: On-site compliance inspection		
RESOLVED COMPLAINTS:		

Facility Description

Brightmark Willow Point is an anaerobic digester facility located at the Willow Point Dairy Farm located in Ionia County. The facility uses dairy cow manure to generate gas that is processed through gas clean-up equipment to produce renewable natural gas that is injected into a natural gas pipeline located offsite.

The process starts with manure being added into their enclosed anaerobic digester. The company requested the flexibility to use ferric chloride (Sulfafix) to reduce the H_2S in the digester gas which will overall decrease the SO_2 emissions. The Sulfafix reacts with the H_2S in the digester and holds the H_2S in the digestate as a precipitate. The solids or digestate will be discharged into the existing lagoon and later be land-applied as fertilizer. The facility is currently monitoring H2S concentrations to determine if ferric chloride will be needed. The biogas from the digester is routed into EUGCU which contains a gas cleaning and upgrading unit. Once the gas is processed to meet the gas standards it will enter the pipeline.

A boiler is used to heat the digester and is fueled by pipeline natural gas and not the renewable natural gas from the facility. The gas cleaning and upgrading unit processes the digester gas to meet pipeline quality specifications. The gas cleaning and upgrading unit includes the following equipment:

- Feed Compressor
- Six absorber vessels with media
- Vacuum compressor
- Two tanks (tail gas buffer, product gas buffer)
- Product compressor

Regulatory Analysis

Brightmark Willow Point is a minor source currently operating under permit to install (PTI) No. 185-20. The permit addresses a gas cleaning and upgrading unit (EUGCU) that is controlled by a thermal oxidizer, as well as a flare (EUFLARE) that burns off-spec gas or excess digester gas. The facility has a 5.0 MMBtu/hr natural gas-fired boiler

that is used to heat the digester. The boiler was exempted from review at the time of permitting under Rule 282(2)(b)(i).

Compliance Evaluation

Prior to entering the facility, a survey around the facility was conducted. No visible emissions were noted, and only normal odors associated with a dairy farm were noted. At the facility staff consisting of Eric Grinstern and Dillon King met with the operators of the facility, David Schupp and Joe Cornelisse. Brightmark contracts with NAES to operate the facility.

Below is an evaluation of compliance based on PTI No. 185-20.

FGFLARE

Emission units: EUGCU, EUFLARE.

EUGCU: A gas cleaning and upgrading unit to upgrade the raw anaerobic digester gas. Emissions controlled by a thermal oxidizer.

EUFLARE: A digester gas flare that burns off-spec gas and excess digester gas.

Emission Limits

Restricts the emission of SO2 to 39.9 tpy based on a 12-month rolling time period. Compliance with the emission limit for SO2 is demonstrated through the requirement to calculate and record the monthly and 12-month rolling total SO2 emissions. SO2 emissions are calculated based on the requirement that the facility monitor the volumetric flow rate of gas to FGFLARE, as well as the H2S concentration of gas burned in FGFLARE.

The facility previously notified AQD that the H2S concentration in the tail gas was too high for the meter. This resulted in the loss of H2S data to allow for SO2 calculations when the facility started up in December 2022 through April 2023. The facility also notified AQD after the onsite inspection that they believe the meter that measures H2S to the flare and thermal oxidizer is inaccurate. The facility stated they just become aware of the issue and are investigating. SO2 emission data was calculated starting in May 2023. The highest recorded SO2 emissions occurred in May 2023 with 4216 pounds, after which emissions dropped to 454 pounds in June 2023. SO2 emissions for the available data was 2.428 tons/12-month rolling total.

Material Limits

Restricts the amount of biogas burned to 160.3 MMscf/yr for FGFLARE. The facility provided records documenting a total of 61.55 MMscf, based on a 12-month rolling time period. This is the total amount of biogas burned in the utility flare as well as the thermal oxidizer.

Restricts the amount of biogas burned to 65.7 MMscf/yr into the thermal oxidizer of EUGCU. The facility records document a total of 42.26 MMscf, based on a 12-month rolling time period, of biogas burned in the thermal oxidizer.

The facility is restricted to burn only natural gas, or gas produced by the anaerobic digester (digester biogas) in EUFLARE. No other fuel source was observed during the inspection.

Compliance with the throughput limit is demonstrated by the requirement for facility to record the total volume of biogas burned in each EUFLARE and EUGCU on a monthly and 12-month rolling time period. The facility provided requested records documenting compliance.

The H2S concentration of biogas to EUFLARE is restricted to 2,950 ppmv, based on a calendar month average. The instantaneous H2S concentration of the biogas is limited to 3,500 ppmv. The facility provided records documenting a monthly H2S average high of 2,646 ppmv in May 2023. At the time of the inspection the flare was not operating.

The H2S concentration of biogas to EUGCU (to TO) is restricted to 7,200 ppmv, based on a calendar month average. The instantaneous H2S concentration of the biogas is limited to 8,658 ppmv. The facility provided records documenting a monthly H2S average high of 7,852 ppmv in May 2023. All other months with data were below the limit. At the time of the inspection the H2S concentration of the biogas to the TO was 107.5 ppm.

Process/Operational Restrictions

Restricts the volumetric feed rate for FGFLARES to a maximum of 305 standard cubic feet per minute and the volumetric feed rate (tail gas) for EUGCU to a maximum of 125 standard cubic feet per minute. Compliance with the feed rate limit is demonstrated by the requirement that the facility install a device to monitor and record the volumetric feed rate of digester gas burned in each emission unit on a continuous basis. During the inspection the observed feed rate from EUGCU was 121.98 scfm. The flare did not have gas flowing to it at the time of the inspection.

Requires the submittal of PM/MAP for FG within 90-days of completion of installation of the equipment. A PM/MAP has been submitted.

Requires the submittal and operation under a nuisance minimization plan for FGFLARE within 90-days permit issuance. A nuisance minimization plan was submitted.

Design/Equipment Parameters

Requires the installation of a device to monitor and record the volumetric flow rate of digester gas burned in each emission unit within FGFLARE, on a continuous basis.

The facility has a device installed to monitor and record the volumetric flow rate of gas to each emission unit.

Requires the installation of a device to monitor the H2S concentration in EUFLARE and EUGCU, at a minimum of once per day. The facility has installed an H2S monitor, however, the facility believes that the monitor is not providing accurate data. Additionally, the H2S concentrations in the gas were initially too high for the monitor.

Requires operating the TO with a minimum temperature of 1450 degrees F and monitoring and record the TO temperature on a continuous basis. Review of the supplied records showed compliance with the minimum temperature, except for approximately 30 minutes on August 8, 2023, when the temperature was as low as 719 degrees. From the records, it is not possible to determine if biogas was being burnt in the TO at the time. At the time of the inspection the observed TO temperature was 1683 degrees F.

Monitoring/Recordkeeping

The facility is required to maintain records of the H2S concentration of the biogas routed to EUFLARE and EUGCU. The facility is maintaining H2S concentration records. However, due to issues with the monitor, they do not have data from December 2022 through April 2023. Additionally, the facility believes that the monitor is providing inaccurate data.

Requires the facility to maintain records of the total volume of gas burned in EUFLARE and EUGCU on a monthly and 12-month rolling time period. The facility is maintaining the required records.

Requires the facility to calculate the monthly average H2S concentration in the biogas sent to EUFLARE. The facility is maintaining monthly average H2S concentration records from May 2023 until current.

Requires the facility to calculate and record the monthly and 12-month rolling total SO2 mass emissions from FGFLARE. The facility is maintaining the records, from May 2023 until current. The facility also notified AQD after the onsite inspection that they believe the meter that measures H2S to the flare and thermal oxidizer is inaccurate.

Stack/Vent Restrictions

The stack SVGCU is required to be a maximum of 36 inches in diameter and have a minimum height of 18 feet. The stack SVFLARE is required to be a maximum of 6 inches in diameter and have a minimum height of 15 feet. Measurement of both stacks with a digital hypsometer showed that they met the stack/vent restrictions.

Miscellaneous

During the inspection staff observed a flare associated with the digester tank. The facility stated that the flare is not in use. The facility previously discussed the backup/pressure relief flare. While it is possible the flare qualifies for exemption from permitting under Rule 285(2)(g), the facility plans to seek a permit modification to account for the flare.

CONCLUSION

Based on this inspection, the facility appears to be in compliance with applicable air quality rules and regulations, with the exception of the following:

PTI No. 185-20, FGFLARE, II.4. Exceedance of the H2S concentration of biogas to EUGCU (to TO) concentration limit of 7,200 ppmv, based on a calendar month average. The facility provided records documenting a monthly H2S average of 7,852 ppmv in May 2023.

PTI No. 185-20, FGFLARE, IV.2. Failure to maintain a device to monitor and record the H2S concentration in EUFLARE and to the thermal oxidizer of EUGCU. The facility documented that the H2S concentration in the gas was too high for the monitoring device from December 2022 through April 2023.

PTI No. 185-20, FGLARE, VI.7. Failure to maintain records of the monthly total SO2 mass emissions from FGFLARES from December 2022 through April 2023 because the H2S concentration in the gas was too high for the monitoring device.

A Violation Notice will be issued to address the documented violations.

NAME Eric Grinstern DATE 10/20/2023 SUPERVISOR HH