

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

P115273399

<b>FACILITY:</b> Brightmark Meadow Rock RNG, LLC		<b>SRN / ID:</b> P1152
<b>LOCATION:</b> 7691 Russel Road, GREENVILLE		<b>DISTRICT:</b> Grand Rapids
<b>CITY:</b> GREENVILLE		<b>COUNTY:</b> MONTCALM
<b>CONTACT:</b> Lillian Burns , Senior Manager, Environmental Compliance		<b>ACTIVITY DATE:</b> 09/04/2024
<b>STAFF:</b> Eric Grinstern	<b>COMPLIANCE STATUS:</b> Non Compliance	<b>SOURCE CLASS:</b> MINOR
<b>SUBJECT:</b> Scheduled compliance inspection		
<b>RESOLVED COMPLAINTS:</b>		

## Facility Description

Brightmark Meadow Rock is an anaerobic digester facility located at the Meadow Rock Dairy Farm in Montcalm County. The facility uses dairy 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.

## Regulatory Analysis

Brightmark Meadow Rock is a minor source currently operating under permit to install (PTI) No. 186-20. 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 2.5 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, AQD staff consisting of Eric Grinstern (EG) met with the operators of the facility, David Schupp and Joe Cornelisse. Brightmark contracts with NAES to operate the facility.

The facility was issued a Violation Notice on October 27, 2023, to address violations documented in an inspection conducted on September 19, 2023. The VN addressed the following violations:

EUGCU – Operation of the emission unit without the thermal oxidizer (TO) operating in a satisfactory manner. During start-up, the methane content of the gas is too high to vent to the TO. Venting to the TO with high methane-content gas causes it to overheat. Instead, the gas is vented to the flare, which is not allowed by the permit. The facility has since modified the TO to allow gas with a higher methane content to be combusted in the TO, but not high enough to avoid gas needing to be vented to the flare completely during start up.

**FGFLARE – Failure to maintain and operate a device to monitor and record H<sub>2</sub>S concentration of the biogas sent to EUFLARE and the TO of EUGCU from January 2023 through April 2023. The facility has resolved this violation and is now monitoring the H<sub>2</sub>S concentration.**

**Below is an evaluation of compliance based on PTI No. 186-20.**

### **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.**

**The process starts with manure being added into the enclosed anaerobic digester. The solids are discharged and dewatered and dried by the farm to use as bedding. The biogas from the digester is routed into EUGCU, the gas cleaning and upgrading unit. EUGCU produces a waste tail gas stream low in BTU content that is controlled by a thermal oxidizer. If the processed biogas from EUGCU is off spec, it is burned in a flare, EUFLARE. Once the gas meets the gas standards it is bottled and trucked to an off-site location where the gas is injected into the pipeline.**

**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

**During the previous inspection the facility stated during start-up the methane content of the gas is too high to vent to the TO. Start-up lasts for about 30 – 45 minutes. Venting to the TO with high methane content gas causes it to overheat. Instead, the gas is vented to the flare. The facility has since modified the TO to allow for the combustion of higher methane content gas. This modification allows for the burning of gas with a higher methane content, but not high enough to avoid gas needing to be vented to the flare completely during start up.**

### **Emission Limits/Recordkeeping**

**Restricts the emission of SO<sub>2</sub> to 37.2 tpy based on a 12-month rolling time period. Compliance with the emission limit for SO<sub>2</sub> is demonstrated through the requirement to calculate and record the monthly and 12-month rolling total SO<sub>2</sub> emissions. SO<sub>2</sub> emissions are calculated based on the requirement that the facility monitor the volumetric flow rate of gas to FGFLARE, as well as the H<sub>2</sub>S**

concentration of gas burned in FGFLARE. The facility has previously disclosed that they believe the H<sub>2</sub>S meters are providing readings that on average are higher than the actual concentrations, resulting in calculated SO<sub>2</sub> emissions higher than the actual emissions. The facility stated that they are taking periodic Draeger samples that document lower H<sub>2</sub>S concentrations than the installed monitors.

The highest recorded SO<sub>2</sub> emissions for the previous 12 months occurred in May 2024 with 2.44 tons. SO<sub>2</sub> emissions for the most recent 12-month period were 10.61 tons.

### **Material Limits/Recordkeeping**

Restricts the amount of biogas burned to 126 MMscf/yr for FGFLARE. The facility provided records documenting a total of 57.14 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 43 MMscf/yr into the thermal oxidizer of EUGCU. The facility records document a total of 28.76 MMscf, based on a 12-month rolling time period, of biogas burned in the thermal oxidizer.

Compliance with the throughput limit is demonstrated by the requirement for the 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 is currently maintaining the required records.

Other than the natural gas burned in the pilot, the permittee shall burn only gas produced by the anaerobic digester (digester biogas) in EUFLARE. The facility previously disclosed that they were using propane as a pilot gas. The facility has since converted to natural gas as a pilot fuel. The ignition fuel for the flare is propane. After ignition, the pilot burns natural gas.

### **Process/Operational Restrictions/Recordkeeping**

Restricts the volumetric feed rate for FGFLARES to a maximum of 240 standard cubic feet per minute and the volumetric feed rate for EUGCU (tail gas to TO) to a maximum of 82 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 gas flow rate from EUGCU to the TO was 114.8 scfm. The flare was only on pilot 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.

## **Design/Equipment Parameters/Recordkeeping**

**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. The flow rate to the TO at the time of the inspection was 91.03 cfm.**

**Requires the installation of a device to monitor the H<sub>2</sub>S concentration in EUFLARE and thermal oxidizer of EUGCU. The facility has a monitor installed to record H<sub>2</sub>S concentrations. The facility stated that they are having issues with the accuracy of the GCU tail gas H<sub>2</sub>S monitor readings. The facility is working to resolve the problem. The H<sub>2</sub>S concentration was 3,725 ppm at the time of the inspection.**

**The permittee shall not operate EUGCU, unless the TO is install and operating with a minimum temperature of 1450 degrees F with monitoring and recording of the TO temperature on a continuous basis. The TO is installed and operating. Review of records while onsite showed compliance with the 1450-degree minimum temperature. The TO temperature at the time of the inspection was 1840 degrees. The facility stated during the inspection that during start-up the methane content of the gas is too high to vent to the TO. Venting to the TO with high methane content gas causes it to overheat. Instead, the gas is vented to the flare. The facility has since modified the TO to allow for combusting of high methane content gas. This modification allows for the burning of gas with a higher methane content, but not high enough to avoid gas needing to be vented to the flare completely during start up. The facility has a purchase order in to have the TO modified to allow for the combustion of higher methane content gas.**

## **Monitoring/Recordkeeping**

**The facility is required to maintain records of the H<sub>2</sub>S concentration of the biogas routed to EUFLARE and EUGCU. H<sub>2</sub>S concentration records are being maintained.**

**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 of the total volume of gas burned.**

**Requires the facility to calculate and record the monthly and 12-month rolling total SO<sub>2</sub> mass emissions from FGFLARE. SO<sub>2</sub> emission records are being maintained.**

## **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 4**

inches in diameter and have a minimum height of 20 feet. Measurement of both stacks during the previous inspection with a digital hypsometer showed that they met the stack/vent restrictions.

### **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. 186-20, FGFLARE, IV.3. Operation of EUGCU without the thermal oxidizer operating in a satisfactory manner. During the inspection the facility stated that during start-up the methane content of the gas is too high to vent to the TO. Venting to the TO with high methane content gas causes it to overheat. Instead, the gas is vented to the flare.**

NAME Eric Grinstern

DATE 09/12/24

SUPERVISOR HH