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

P1158/2/80		
FACILITY: Brightmark Sunryz RNG, LLC		SRN / ID: P1158
LOCATION: 8460 West Mulberry Road, MORENCI		DISTRICT: Jackson
CITY: MORENCI		COUNTY: LENAWEE
CONTACT: Lillian Burns , Senior Manager, Environmental Compliance		ACTIVITY DATE: 07/02/2024
STAFF: Brian Merle	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS:
SUBJECT: Scheduled, announced on site inspection. Scott Miller, AQD Jackson District Supervisor, also in attendance.		
RESOLVED COMPLAINTS:		

Facility Contacts

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Lillian Burns, Senior Manager, Environmental Compliance

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Purpose

On Tuesday, July 2nd, 2024, an announced, scheduled compliance inspection was conducted at Brightmark SunRyz RNG, LLC, located at 8460 West Mulberry Road, Morenci, Michigan. The purpose of the inspection was to determine the facility's compliance status with applicable federal and state air pollution regulations, particularly with the Michigan Natural Resources and Environmental Protection Act 451 of 1994, Part 55, Air Pollution Control and the administrative rules, as well as the conditions of Permit to Install (PTI) No. 188-20.

Facility Location

The facility is located on SunRyz Dairy farm, and is surrounded by farm fields on all sides, with the closest residence being close to 1800 ft to the south.

Facility Background

The facility was issued PTI No. 188-20 on May 7th, 2021, and began operating in January of 2023. They produce natural gas through anerobic digestion of manure produced by the dairy farm. The gas produced by the digester is cleaned and upgraded to be pipeline quality, and the tail gas from this process is directed to the thermal oxidizer on site. If the cleaning and upgrading unit is down, the digester gas is sent directly to the flare on site. The flare is also a back-up control in case the gas from the gas cleaning and upgrading unit is not pipeline quality.

AQD received an Environmental Audit Disclosure on May 29th, 2024. The results of this audit indicated that there may be issues with the H2S meters used by the facility, and there may be

operating conditions where methane is not properly combusted in the TO or flare due to its concentration.

Regulatory Applicability

The facility operates under PTI No. 188-20.

Arrival

I contacted the facility on July 1st to ensure that staff would be on site for the inspection.

AQD Jackson District Supervisor Scott Miller and I arrived at the farm at 11:00 AM and proceeded back to the facility. The flare was observed to be operating at the time without any visible emissions, and the only odors observed were from the cattle. There we met with Mike Kyer and Jim Ames, the site operator, in the site office.

Pre-inspection Meeting

We began the inspection by going over a safety briefing. The facility requires hard hats, safety glasses, safety boots, and FR coveralls if going near the equipment. Additionally, facility staff had gas meters that if alarmed, we would have to move upwind of the facility.

I began by asking some background questions about the facility. The facility operates 24/7, with occasional downtime for maintenance, and has three employees. The facility only uses waste generated by the dairy farm, and the resulting digestate from the process is pumped into a lagoon and used for fertilizer.

Inspection

We left the trailer and walked towards the thermal oxidizer (TO) and flare (Images 1 and 2). Here I checked the stack heights against the permit and measured both the TO and flare at 20 feet, which meets the minimum heights of 18 and 13 feet outlined in the permit, respectively. Here, I asked Mike about the process. First, I asked about any additional emission points in the process. Mike explained that the digester tank has a pressure relief system. Jim explained that they operate the digester at 40% capacity and should not have any issues with gas releasees, also called "burping", but if they ever did they have procedures in place for reporting.

Next, I asked about the monitors required in SC IV. 1 through 4. The monitor used to determine the volumetric flow rate of digester gas burned at each unit are calibrated annually and serviced quarterly. The devices used to monitor the H2S concentration at the flare and TO are installed but are not operating correctly due to pressure swings in the system. These pressure swings are out of the operation range of the monitors. The facility is currently evaluating solutions to this problem, which may include installing pressure regulators to ensure the gas going to the monitor is within its operating pressure. I then asked about the combustion chamber temperature monitoring device. Mike explained that the device is calibrated annually and serviced quarterly. Mike also explained that a temperature alarm was programmed into the system, which would be included in their revised MAP.

Mike went on to explain that the condition they observed during startup where the methane concentration in the tail gas was too high for the thermal oxidizer, but too low for the flare. He

explained that they were reconfiguring the thermal oxidizer to accept higher concentrations of methane: previously, it operated between 0-13% methane and can now operate up to 20% methane. They are currently evaluating this to ensure it resolves the issue.

Mike and I then walked over to the digestate tank. On the way, I asked if they ever performed leak detection. Mike explained that their monitoring system can detect any leaks and they can alter the flow through the system to find it. If not, they will purge the system with nitrogen. We walked around the digester to the boiler room. Here, I observed the boiler and confirmed it was the 2.4 MMBTU/hr natural gas boiler as permitted (Image 3). This boiler is exempt under Rule 282(2)(b)(i).

We then returned to the control trailer and waited for Scott and Jim. When they returned, Jim showed me their process diagram (Image 4). He showed and explained all of the process variables they are able to monitor and control. He also explained that they employ the use of a task tracker to ensure they are performing maintenance at the proper intervals. He also explained that they system is capable of processing 130,000 gallons of waste but they only receive 90-100,000 gallons a day from the farm. They produce 160-190 scfm of gas per day from the digester-at the time of the inspection they were producing 214 scfm.

Post-inspection meeting

I told Mike that I would email him and Lillian the records I would need to complete my inspection. We thanked them for their time and left at 12:15 PM.

Records Review

I received the following response from Lillian on July 12th for the records I requested (Attachment 1).

Request #1: All records related to, or as required by, the PM/MAP (permit condition SC VI.2).

Response #1: SC VI.2 requires the facility to keep records "related to, or as required by, the PM/MAP." The PM/MAP specifically references three categories of information subject to "additional record-keeping to be maintained as required by the permit." (PM/MAP, at 6.) Those portions of the PM/MAP relate to the requirement that the facility continuously check that the volumetric flow meter, the H2S monitor, and temperature of the EUGCU are operational. The data reflecting those inspection parameters are provided in the below responses relating to Request 3 (volume), Request 2 (H2S content), and Request 4 (temperature).

Request #2: H2S content of the biogas routed to each EUFLARE and EUGCU. Please provide for the month of May 2024 (permit condition SC VI.3).

Response #2: Please refer to the "H2S" tab of the attached file that contains the H2S content of biogas routed to each EUFLARE and EUGCU. As Brightmark disclosed during the Part 148 self-audit disclosure summary, the H2S meter is not operating properly. Brightmark believes that the average H2S to EUGCU and the average H2S to EUFLARE (during startup) are lower than what is being measured. The H2S is measured after the gas goes through a pressure swing adsorber system which fluctuates in pressure as it fills and empties. The resulting fluctuations lead to an increase in H2S partial pressure. The meter is calibrated to read the number of H2S molecules at

atmospheric pressure. In our process we are not at atmospheric pressure, which changes the calculated volume of H2S. When the pressure is higher than atmospheric pressure, the meter overestimates the amount of H2S in the waste gas stream. 2

Request #3: Total volume (MMscf) of biogas burned in each EUFLARE and EUGCU on a monthly and 12- month rolling time-period basis (permit condition SC VI.4).

Response #3: Please refer to the "Monthly Summary" tab of the attached file that contains the total volume (MMscf) of biogas burned in each EUFLARE and EUGCU on a monthly and 12-month rolling time-period basis.

Request #4: Temperature in the combustion chamber of the thermal oxidizer, on a continuous basis, during operation of EUGCU. Please provide for the time period of 05/05/2024 to 05/11/2024, or another comparable full week of data (permit condition SC VI.5).

Response #4: Please refer to the "TOU Temp Data" tab of the attached file that contains the temperature in the combustion chamber of the thermal oxidizer, on a continuous basis, during operation of EUGCU for the time-period requested.

Request #5: Monthly average H2S concentration in the biogas sent to EUFLARE and the biogas sent to the thermal oxidizer of EUGCU (permit condition SC VI.6).

Response #5: Please refer to the "Monthly Summary" tab of the attached file that contains the monthly average H2S concentration in the biogas sent to EUFLARE and the biogas sent to the thermal oxidizer of EUGCU. As Brightmark disclosed during the Part 148 self-audit disclosure summary, the H2S meter is not operating properly. As a result, we believe that the average H2S to EUGCU and the average H2S to EUFLARE (includes startup) are lower than what is being measured.

Request #6: Monthly and 12-month rolling total SO2 mass emissions for FGFLARE (permit condition SC VI.7).

Response #6: Please refer to the "Monthly Summary" tab of the attached file that contains the monthly and 12-month rolling total SO2 mass emissions for FGFLARE. Please refer to the "SO2 Totals" tab that shows SO2 calculations and data for the month of May. As Brightmark disclosed during the Part 148 self-audit disclosure summary, the SO2 emissions are calculated based on H2S data. Brightmark believes that SO2 emissions are actually lower than what is reported.

Permit Conditions Review

FGFLARE

Attachment 2-Monthly Summary data provided for the months of September 2023 to May 2024.

SC I.1 39.9 tpy limit on SO2 on a 12-month rolling time period basis. The facility reported 32.01 tons for the previous 12 months for May 2024 (Attachment 2). They are in compliance with this condition. The facility believes that this data may be inaccurate due to the use of collected H2S data being used to calculate the SO2 emissions, and the H2S readings may be inaccurate due to pressure swings in the system.

SC II.1 149.8 MMscf/yr limit on biogas to the flare on a 12-month rolling time period basis (Attachment 2). The rolling total for May 2024 was 24.24 MMscf. They are in compliance with this condition.

SC II.2 61.4 MMscf/yr limit on biogas to the thermal oxidizer on a 12-month rolling time period basis (Attachment 2). The rolling total for May 2024 was 22.89 MMscf. They are in compliance with this condition.

SC II.3 3,150 ppmv limit on the concentration of H2S in the biogas routed to the flare on a calendar month average basis (Attachment 3-H2S). The facility exceeded this value for November and December of 2023, as well as January, February, March, April, and May of 2024. The facility states this is due to the improperly operated H2S monitors. They are not in compliance with this condition.

SC II.4 7,700 ppmv limit on the concentration of H2S in the biogas routed to the thermal oxidizer on a calendar month average basis (Attachment 3). The facility exceeded this limit in October 2023 and March, April, and May of 2024. They are not in compliance with this condition.

SC II.5 The facility only burns natural gas and biogas in the flare. They are in compliance with this condition.

SC II.6 The facility provided H2S monitoring data for the month of May 2024. The data indicates that the H2S concentration of the biogas routed to the flare during startup was often over the permit limit of 3,500 ppmv and is not in compliance (Attachment 3). This was explained by the facility as being caused by pressure differences in the system impacting the sensor. The biogas H2S concentration routed to the flare from the digester and for off-spec gas was in compliance.

SC II.7 The facility provided H2S monitoring data for the month of May 2024. The data indicates that the H2S concentration of the biogas routed to the thermal oxidizer was frequently over the permit limit of 8,658 ppmv and is not in compliance (Attachment 3). This was explained by the facility as being caused by pressure differences in the system impacting the sensor.

SC III.1 The volumetric feed rate for FGFLARES shall not exceed a maximum of 285 standard cubic feet per minute. The facility constantly monitors flows in each part of the system to ensure they do not exceed permitted values. They are in compliance with this condition.

SC III.2 The volumetric feed rate for EUGCU shall not exceed a maximum of 117 standard cubic feet per minute. The facility constantly monitors flows in each part of the system to ensure they do not exceed permitted values. They are in compliance with this condition.

SC III.3 The facility submitted a Preventative Maintenance/Malfunction abatement plan. They are in compliance with this condition.

SC III.4 The facility submitted a Nuisance Minimization Plan for Odors. They are in compliance with this condition.

SC III.5 The facility has not submitted a Best Management Practices Plan for the use of ferric chloride to reduce the H2S concentration in the digester because the facility does not use ferric chloride in their process. If the facility ever begins to use ferric chloride, AQD requests that they submit this plan before beginning use.

SC IV.1 The facility has installed monitors for the volumetric flow rate of digester gas burned in each emission unit within FGFLARE. These are calibrated and maintained and are operated in a satisfactory manner. They are in compliance with this condition.

SC IV.2 The facility has installed monitors for the H2S concentration in EUFLARE and into the thermal oxidizer of EUGCU. These are calibrated and maintained, but the facility believes that they are not functioning properly due to pressure changes in the system. They are not in compliance with this condition.

SC IV.3 The thermal oxidizer is installed, maintained, and operated in a satisfactory manner. The minimum combustion chamber temperature of 1450 degrees Fahrenheit is maintained with alarms. The facility provided thermal oxidizer temperature data for the day of March 11th, 2024 (Attachment 4-TOU temp data). The lowest temperature recorded was 1582.00 degrees Fahrenheit. They are in compliance with this condition.

SC IV.4 The facility has a temperature monitoring device in the combustion chamber of the thermal oxidizer and is monitored on a continuous basis. They are in compliance with this condition.

SC VI.2 The facility maintains the following records to demonstrate compliance with this condition: continuously check that the volumetric flow meter, the H2S monitor, and temperature of the EUGCU are operational. These were provided in the records request as volume, H2S content, and temperature (Attachment 2). They are in compliance with this condition.

SC VI.3 The facility provided records of the H2S content of the bigas routed to each EUFLARE and EUGCU for the month of May 2024 (Attachment 3). They are in compliance with this condition.

SC VI.4 The facility provided records of the total volume (MMscf) of biogas burned in each EUFLARE and EUGCU on a monthly and 12-month rolling time period basis (Attachment 2). They are in compliance with this condition.

SC VI.5 The facility provided temperature records for the combustion chamber of the thermal oxidizer on a continuous basis for May 5th to 11th, 2024. Readings are made at equally spaced intervals of 1 minute. They are in compliance with this condition.

SC VI.6 The facility provided the monthly average H2S concentration in the biogas sent to EUFLARE and the thermal oxidizer of EUGCU September 2023 to May 2024 (Attachment 2). They are in compliance with this condition.

SC VI.7 The facility provided monthly and 12-month rolling total SO2 mass emissions for FGFLARE from September 2023 to May 2024 (Attachment 2). The data to perform these calculations were provided in Attachment 5-SO2 Totals for the month of May. They are in compliance with this condition. The facility believes that this data may be inaccurate due to the use of collected H2S data being used to calculate the SO2 emissions, and the H2S readings may be inaccurate due to pressure swings in the system.

Compliance Determination

Based on my inspection and the accompanying records review, the facility is not in compliance with conditions SC II.3, SC II.4, SC II.6, SC II.7, and SC IV.2. They are in compliance with all other conditions of their permit. A Violation Notice will be issued to the facility for the listed violations above.

NAME ______ DATE 07/31/2024 SUPERVISOR _____