

DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION  
ACTIVITY REPORT: Scheduled Inspection

B722240916

FACILITY: JAGUAR ENERGY, FREDERIC 15 GAS PLANT		SRN / ID: B7222
LOCATION: SEC 15 T28N R4W, FREDERIC		DISTRICT: Cadillac
CITY: FREDERIC		COUNTY: CRAWFORD
CONTACT: John Ward , Operator		ACTIVITY DATE: 07/11/2017
STAFF: Rob Dickman	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Scheduled inspection of this major source.		
RESOLVED COMPLAINTS:		

AQD staff performed an inspection of this facility. The purpose of the inspection was to determine the facility's compliance with Renewable Operating Permit (ROP) No. MI-ROP-B7222-2013 and applicable state and federal air pollution control regulations. The facility was in operation at the time of the inspection and was unmanned.

The Frederic 15 Gas Sweetening Plant is located on Deward Road in Section 15, Township 28 North, Range 4 West. It is approximately four miles northwest of Frederic, Michigan. The facility takes in natural gas, gas condensate, crude oil, and brine from oil wells in the area. It uses a "production unit" (inline heater) to help separate gasses and brine from the crude oil. The natural gas produced is "sour gas;" that is, it contains hydrogen sulfide. To make this gas usable the gas is processed through an amine gas sweetening process, which separates out the hydrogen sulfide. Then the gas runs through a glycol dehydrator, which removes water vapor. Finally the natural gas passes through a compressor and is sent off site through a pipeline. The compressor engine uses some of this natural gas for its fuel. The hydrogen sulfide is burned in an incinerator, to make sulfur dioxide. The sulfur dioxide is emitted to the air. This is done because sulfur dioxide is less dangerous and has much less odor than hydrogen sulfide. The facility has a flare as backup for the incinerator. The flare pilot is sweet natural gas only. In the event the flare pilot goes out, the facility's safety systems are designed to shut down the facility and shut in the producing wells, as appropriate. Oil and natural gas condensate produced on site are stored in tanks until carried away by truck.

At the time of the inspection, winds were light and out of the southwest. No strong odors were noted. No opacity was noted at any emission point. Following are the findings of this inspection.

**EUSWEETENING** – Amine gas sweetening process to remove hydrogen sulfide from natural gas. The hydrogen sulfide is burned to form sulfur dioxide using an incinerator.

1. **Emission Limits** – Sulfur dioxide emissions from the emission unit is limited to 1,332 pounds per day based on a 24-hour average and 55.5 pounds per hour based on a 24-hour average. Data pursuant to these emissions limits are submitted by the facility on a monthly basis. These reports are reviewed by AQD staff and have demonstrated compliance.
2. **Material Limits** – There are no material limits associated with this emission unit; therefore, this section is not applicable.
3. **Process/Operational Restrictions** – The facility is required to equip the emergency flare with a continuously burning pilot flame. This flare is so equipped. In the event that the pilot flame is extinguished, an alarm is activated and a callout system notifies facility staff of the outage. The wells feeding the facility are shut-in if the pilot flame is not reignited with 60 minutes.

The fuel used for the pilot flame in the emergency flare is sweet natural gas. Facility staff indicated there are no lines in place in which sour gas could be used as a fuel source for the flare pilot.

All relief valves and the vapor return system for loadout of the pressurized storage vessel are required to be vented to the emergency flare to prevent emissions of hydrogen sulfide and this system is so configured.

During an emergency event, the facility is required to immediately shut-in within one second and all sour gas is required to be flared. At any other time, sour gas from the amine unit or sour gas directly from the wells cannot be sent to the flare. Facility staff indicated that there have been no emergency

events where this has been necessary.

A continuous in-shed monitoring program was in place at the time of the inspection. The ROP requires that all inflow streams to the plant be shut off if the concentration of hydrogen sulfide within the building is greater than 100 parts per million. A lower threshold of 20 parts per million for shut off of the inflow has been implemented for worker safety.

4. **Design/Equipment Parameters** – The incinerator is equipped with oxygen and combustor temperature monitoring equipment as required. Audible alarms are used to notify the operator when the oxygen content and combustor temperature drop below the levels listed in the ROP. The actual alarm set points for percent oxygen and combustor temperature are higher than those values listed in the ROP.
5. **Testing/Sampling** – The hydrogen sulfide concentration going to the plant is checked on a monthly basis using colormetric tubes.
6. **Monitoring/Recordkeeping** – The incinerator oxygen monitoring and recording devices are required to be calibrated on a monthly basis and the incinerator monitoring and recording devices are required to be calibrated on a quarterly basis. Records of the calibrations maintained at the facility. The last 12 months of these records were reviewed by AQD staff and demonstrated compliance.

Continuous records of the incinerator temperature and oxygen content were made available for AQD to review. The last 12 months of these records indicate the temperature and oxygen content at the outlet of the combustion chamber of the incinerator were maintained above the required minimum levels except during periods of startup and shutdown.

7. **Reporting** – Annual certifications of compliance and semiannual deviation reports were previously reviewed and documented.

Jaguar Energy is required to submit monthly reports containing the mass flow rate of sour gas, the monthly hydrogen sulfide concentration, and the daily and hourly sulfur dioxide emissions from the facility, which are used for demonstrating compliance with the sulfur dioxide emission limits. These reports are reviewed and documented monthly by AQD staff.

8. **Stack/Vent Restrictions** – The incinerator stack appeared to be constructed in accordance with the parameters listed in the ROP based upon observations made by AQD staff during the inspection.
9. **Other Requirements** – Fencing and a locked gate is used as a means to prevent unauthorized access to the facility as required.

Based upon records observed at the facility, the facility has been maintained in accordance with the preventative maintenance and malfunction abatement plan. At this time, there has been no need to revise the minimum temperature or oxygen content of the incinerator as allowed in the requirements of the ROP.

**EUGLYCOLDEHYDRAT** – This emission unit is included in the ROP and is subject to the requirements of 40 CFR, Part 63, Subpart HH. Currently, the State of Michigan has not taken delegation of authority of this regulation for area sources. Therefore, a compliance analysis of EUGLYCOLDEHYDRAT was not conducted at this time.

**EUNATGASENGINE** – This emission unit is included in the ROP and is subject to the requirements of 40 CFR, Part 63, Subpart ZZZZ. Currently, the State of Michigan has not taken delegation of authority of this regulation for area sources. Therefore, a compliance analysis of EUNATGASENGINE was not conducted at this time.

**Conclusion** – Based upon the on-site inspection and records review, AQD staff considers the facility to be in compliance with their current Renewable Operation Permit.

NAME 

DATE 8/2/17

SUPERVISOR SN