

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Self Initiated Inspection

B914930117

FACILITY: Merit Energy Co.- Frederic 2		SRN / ID: B9149
LOCATION: LYNN LAKE RD, GAYLORD		DISTRICT: Cadillac
CITY: GAYLORD		COUNTY: CRAWFORD
CONTACT: Sean Craven , Regulatory Analyst		ACTIVITY DATE: 06/25/2015
STAFF: Caryn Owens	COMPLIANCE STATUS: Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: Self Initiated Inspection to go through facility operations with Bill Duley of DEQ-OOGM.		
RESOLVED COMPLAINTS:		

On Thursday, June 25, 2015, Caryn Owens of the DEQ-AQD and Bill Duley of the DEQ-OOGM conducted a self-initiated inspection of Merit Energy Company (Merit) – Frederic 2 CPF (B9149) located on Lynn Lake Road, in Frederic Township, Crawford County, Michigan. More specifically, this Facility is set back on a hill approximately 1.5 miles north on Lynn Lake Rd on the east side of the road. However, the road sign read “Newman Rd” instead of Lynn Lake Rd, and a sign at the entrance to the road read “Frederic 2 - 11700 Newman Rd”. Lynn Lake Rd (or Newman Rd) was located approximately 0.6 miles west of the Twin Peaks Road and North Old US 27 intersection. The facility had a gate at the entrance, but was not locked. Visible “Poisonous Gas” signs were posted throughout the site, and Red, yellow, and green lights were located at the entrance of the facility and at each of the buildings.

Merit has opted out of major source applicability by limiting operational and/or production limits potential to emit (PTE) to be below major source thresholds. The purpose of this inspection was to gain familiarity between DEQ-OOGM and AQD inspections at oil and gas sites. DEQ was accompanied by Tom Heller, Sean Craven and Don Brandt of Merit during the field inspection. DEQ obtained records from the facility, so a records review was also conducted at this time. The site is an area source for National Emission Standards for Hazardous Air Pollutants (NESHAP) from Oil and Natural Gas Production facilities (40 CFR Part 63 Subpart HH), and NESHAP for Stationary Reciprocating Internal Combustion Engines (40 CFR Part 63 Subpart ZZZZ). The State of Michigan does not have delegated authority of the area source NESHAPs, and thus these areas were not reviewed by the DEQ at this time.

During the field inspection, the weather conditions were partly cloudy, with winds from the east, approximately 5 miles per hour, and approximately 70 degrees Fahrenheit. This site consisted of a separator building, amine (sulfinol) plant, glycol dehydrator building, and two compressor buildings. A tank battery consisting of four approximately 400 barrel (bbl) tanks with a vapor recovery unit (VRU) was on the western portion of the Property. The site also consisted of five heaters, a jack pump, and a flare. A windsock was observed in the tank battery, and was limp during the inspection. A slight petroleum odor was noted throughout the site, but was not detected at the facility boundary.

The gas enters the facility on the north-northwest portion of the site, and flows through inline heaters, then to the separator building which separates the crude oil, natural gas, and condensate. The separators direct the fuel to specific areas of the site. The crude oil is routed to the tank battery area, and is tested by a Lease Accountability Custody Transfer (LACT) unit that determines if the crude oil is the right consistency for sales, if it is not, the crude oil is routed through a heater treater to remove additional water from the oil and then routed back to the tank battery for sales.

The natural gas is metered in the separator building which comes in under low pressure, and sent to the two compressors located in the southwestern building on the property, which brings the gas to high pressure, and then sends the gas to the sulfinol plant, on the southeast portion of the site, to treat the gas. The sulfinol plant sweetens condensate and natural gas by stripping out sour-acid gas (H₂S). The sour-acid gas is pumped into an acid gas injection well along with brine, and the sweet gas flows to the glycol dehydrator to dry the field gas prior to sales.

The glycol dehydrator uses tri-ethylene glycol, and the emissions are contained with a vapor recovery unit. Two iron sponges are located in the central portion of the property, southeast of the separator building, and are used as back-up for the sulfinol plant. The sweet gas goes to sales, which is metered on the southwestern portion of the property. No visual emissions were present during the field inspection. A flare on the southern portion of the property is always lit with sweet gas. It is used for emergency/pressure relief situations at the site. During the inspection a clean visible flame was present at the top of the flare.

The site contained two Waukesha compressor engines with catalytic converters and air to fuel ratio controls (AFRC) that were both operating during the site inspection in the southwestern building at the site. The southernmost engine (Unit 195) was operating at approximately 708 revolutions per minute (RPM) and 44 pounds per square inch (psi). The inlet temperature to the catalyst was 799 degrees Fahrenheit and the outlet temperature was 817 degrees Fahrenheit. The AFRC read: left bank 0.818v1289 and right bank 0.869v1453. Based on the malfunction abatement plan (MAP), Unit 195 requires the inlet temperature to be between 718-1,200 degrees Fahrenheit, and the outlet temperature greater than the inlet temperature.

The northernmost engine (Unit 114) was operating at approximately 916 RPM and 60 psi. The inlet temperature of the catalytic converter was 865 degrees Fahrenheit and the outlet temperature was 923 degrees Fahrenheit. The AFRC read: left bank 0.776v1077 and right bank 0.772v1391. The MAP requires the inlet temperature of Unit 114 to be between 657-1,100 degrees Fahrenheit, and the outlet temperature greater than the inlet temperature. The inlet and outlet temperatures of the catalysts were within the temperature ranges identified in the MAP for the facility. Additionally, daily maintenance logs were observed hanging on the east wall of the compressor buildings, and the logs appeared to be filled out correctly.

The facility has been in operation for a while, and Mr. Duley of DEQ-OOGM has been requesting a timeline from Merit on how they will be updating the facility with new secondary containment. The facility has had two spills, one west of the separator building and one in the tank battery area due to the pipelines breaking. Merit is using a bio-remediation system to clean-up the site.

Records Review

Sweetening Facility

- **SC13-16:** The individual emissions of NO_x, CO, and VOC shall not exceed 89 tons per year. Based on the records reviewed, the highest emissions for NO_x were 19.52 tons per 12-month rolling time period. The highest emissions for CO were 27.03 tons per 12-month rolling time period. The highest emissions for VOCs were 4.16 tons per 12-month rolling time period. Hazardous air pollutants (HAPs) emissions shall be below 9 tons per year for a single HAP based on a twelve-month rolling period and below 22.5 tons per 12-month rolling time period for all HAPs. The highest HAP emissions were 1.2 tons per 12-month rolling time period. The fuel usage ranged between 75.3 to 79.1 MMcf per 12-month rolling time period. The monthly throughput to the tanks ranged between 417 to 1,335 bbl per month, and the crude oil trucked from the Property ranged between 60 to 325 bbl per 12-month rolling time period. The Glycol dehydrator circulation rate ranged between 0.45-0.53 gallons per minute, and the production was from the Niagaran formation.
- **SC17:** Monthly records are kept in a manner acceptable to the DEQ.
- **SC18:** Based on the Michigan Air Emissions Reporting System (MAERS), the facility is in compliance with reported annual emissions.
- **SC19:** Maintenance records were received and reviewed, and logs of all the significant maintenance activities appeared to be in compliance to the permit and malfunction abatement plan (MAP), which is further discussed below. Maintenance records are enclosed.
- **SC20:** The vapor recovery unit associated with the tanks appeared to be working properly and was operating during the facility inspection.
- **SC21:** Based on the records reviewed, no bypasses of the catalytic converter occurred between May 2014-May 2015.
- **SC22:** This facility is not subject to 40 CFR Part 60, Subpart KKK.
- **SC23:** A stack test has not been completed for the facility.
- **SC25:** Acid gas is injected underground during normal operations at the facility.
- **SC26-SC28:** In the event that there is a malfunction to the acid gas injection, the facility shuts in the wells that have the highest H₂S concentrations, then routing the acid gas from the sweetening plant

to the onsite emergency/pressure relief flare or routing the acid gas through the iron sponges at the site.

There were nine times from May 2014 through May 2015 that the acid gas injection compressor was shut down. The emissions that were routed to the flare during the times the acid gas compressor was shut down ranged between 0.3 to 1.0 pounds of SO₂ per hour, and 0.00 to 0.02 pounds of H₂S per hour, which were below the emissions permitted limits of 11.2 pounds of SO₂ per hour, and 0.31 pounds of H₂S per hour. The flaring did not occur for more than 48 hours per occurrence or more than 192 hours per 12 month rolling time period.

SC29: Based on the records reviewed, the media was changed and properly disposed on September 19, 2012.

MAP

DEQ requested "Daily Gas Compressor Operating Reports" for the month of December 2014. Additionally, Merit included monthly catalyst differential pressure readings and a facility maintenance log from May 2014 through May 2015.

The MAP incorporated two engines identified as Unit 114 and Unit 195 which are both 750 horsepower Waukesha L7042G Rich Burn engines containing 3-way catalysts and AFRCs. Merit Energy included maintenance logs and indicated the engines did not operate without catalysts from May 2014 through May 2015. The normal temperature range of the catalyst for Unit 114 should be between 657-1,100 degrees Fahrenheit and the outlet temperature should be equal to or greater than the inlet temperature. Based on the "Daily Gas Compressor Operating Reports" reviewed, the inlet temperature was recorded between 695-833 degrees Fahrenheit and the outlet temperature was greater than the inlet temperature. The differential pressure for Unit 114 should be between 0-2 inches of water. Based on the records reviewed, the differential pressure ranged between 0.1-2.0 inches of water.

The normal temperature range of the catalyst for Unit 195 should be between 718-1,200 degrees Fahrenheit and the outlet temperature should be equal to or greater than the inlet temperature. Based on the maintenance records reviewed, the inlet temperature was recorded between 718-898 degrees Fahrenheit and the outlet temperature was greater than the inlet temperature. The differential pressure for Unit 195 should be between 0-3.5 inches of water. Based on the records reviewed, the differential pressure ranged between 0.4-1.6 inches of water.

Based on review of the maintenance records requested, the catalytic converters appear to operating normally and maintained properly. The permittee is following the requirements and meeting the intent of the MAP.

Evaluation Summary:

Based on the activities and records reviewed, the facility appears to be in compliance with Air Quality PTI 201-97, and no further actions are necessary at this time.

NAME Caryn Owens

DATE 6/25/15

SUPERVISOR 