

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

N116027161

FACILITY: Viking Energy of McBain		SRN / ID: N1160
LOCATION: 6751 W. Gerwoude Dr., MCBAIN		DISTRICT: Cadillac
CITY: MCBAIN		COUNTY: MISSAUKEE
CONTACT: Thomas Vine , Plant Manager		ACTIVITY DATE: 09/09/2014
STAFF: Caryn Owens	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Scheduled Inspection and Records Review		
RESOLVED COMPLAINTS:		

On September 9, 2014, Caryn Owens of the DEQ-AQD conducted a scheduled inspection of Viking Energy of McBain (Viking Energy) (SRN: N1160) located at 6751 West Gerwoude Drive, McBain, Missaukee County, Michigan. The field inspection and records review were to determine compliance with the Renewable Operating Permit (ROP) MI-ROP-N1160-2012. The facility is currently an area source of hazardous air pollutants (HAPs). The boiler at the facility is subject to the New Source Performance Standards (NSPS) for Industrial-Commercial-Institutional Steam Generating (Unit 40 CFR Part 60 Subpart Db), and National Emission Standard for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boilers (40 CFR Part 63 Subpart JJJJJJ – Boiler MACT). Additionally, the boiler at the facility is subject to Compliance Assurance Monitoring (40 CFR Part 64- CAM). An on-site emergency generator is subject to the NESHAP for Stationary Reciprocating Internal Combustion Engines (40 CFR Part 63 Subpart ZZZZ – RICE MACT). Since the facility is an area source of HAPs, the State of Michigan does not have delegated authority of the area source NESHAPs (the Boiler MACT and RICE MACT), and thus these areas were not reviewed by the DEQ.

On-Site Inspection:

DEQ was escorted by Mr. Tom Vine, the Plant Manager of Viking Energy. An inspection brochure was not given to Mr. Vine at the time of the inspection. The weather conditions were mostly sunny, with calm winds from the south, and approximately 80°F. Mr. Vine and Ms. Owens began the inspection in the wood (fuel) yard and observed where the fuel is received, handled, and loaded. At the time of the inspection Viking Energy mostly was burning a mixture of creosote wood, untreated wood chips and tire derived fuel chips (TDF). According to Mr. Vine, they've obtained a good source to receive their creosote lumber which is trucked and railed to the facility. Viking Energy has purchased a portable low speed grinder to cut the creosote lumber into chunks and a portable hammer mill grinder to reduce the chunks into chips. The two grinders were not operating at the time of the inspection, but according to Mr. Vine the grinders contain water sprays to reduce the dust. According to Mr. Vine, the facility receives on average six log trucks a day (about 50 tons) and 34 tons per day of TDF. The fuel sources are all stored in separate areas at the facility. Measured amounts of the creosote wood chips and untreated wood chips are layered in a fuel storage pile that enters the pit to the plant. A sweeping arm and auger under the wood chip storage pile (the pit area) are used to take the wood chips to the belt conveyors to feed them to the boiler system. The storage pile can only hold a maximum 4 days of wood chip fuel (both untreated and creosote), so the plant records a 7-day rolling average on how much creosote wood chips and untreated wood chips are added to the storage pile prior being fed to the boiler. Additionally, a tractor scoop fills a hopper connected to a conveyor to load the TDF into the boiler. The amount of wood fuel and TDF are tracked and controlled by the control room operator.

The boiler was operating at full capacity (17MW) and opacity from the continuous opacity monitoring system (COMS) was averaging 5.5 percent. The boiler system is controlled by a multi-cyclone, baghouse and electrostatic precipitator (ESP) to remove pollutants. The ESP was operating all three sections at the time of the inspection. The spark rates were monitored and controlled by the control room operator depending on the opacity readings from the COMS. The ESP sections were operating at:

Section:	<u>1</u>	<u>2</u>	<u>3</u>
Spark per minute:	77	02	0
Secondary Voltage:	37	37	36

The bottom ash is conveyed to a water tank (pug mill) that is scooped and discharged into a dumper outside. Additionally, the multi-cyclone and ESP fly ash is collected and conditioned with water and loaded into a wagon where it is brought to the ash building on the southeastern portion of the site. The doors to the wagon area and ash building are kept closed at all times, except when collected for disposal. According to Mr. Vine, the ash is collected approximately three times per week by Northern A-1 and is used as landfill cover and spill control during emergency situations.

During the inspection, DEQ observed minimal emissions (5% opacity) at the drop point of the wood conveyor. The visible emissions quickly dissipated and no wood chips or saw dust were visible off site. No visible emissions were observed from the stack of the boiler during the inspection. DEQ observed slight wood and creosote odors during the inspection of the wood yard, but the odors were not present off site and were not considered objectionable. The site appeared tidy and no tracking of material or ash were observed off site on West Gerwoude Drive.

Records Review**Source-Wide Conditions:**

No Emission Limits, Material Limits, Design/Equipment Parameters, Testing/Sampling, and Stack/Vent Restrictions are required under Source-Wide Conditions.

Process/Operational Restrictions:

The facility has a Fugitive Dust Emissions Control Plan and Malfunction Abatement Plan (MAP) on file with the DEQ. The MAP was received in August 2001 and the Fugitive Dust Emissions Control Plan was received in May 2008. DEQ reviewed these plans and they are representative of on-site conditions and operations.

Monitoring/Recordkeeping:

The facility maintains records in accordance with their Fugitive Dust Emissions Control Plan that was approved by the DEQ on May 28, 2008.

Reporting:

Reporting of any deviations, quarterly reports, semi-annual reports, and annual compliance reports for ROP certification were submitted to the DEQ in timely manner.

Other Requirements:

The MAP was addressed in Process/Operational Restrictions above.

EURMHANDLING:

The raw material handling that includes primary and secondary screens, a radial stacker, raw material piles, hoppers to chip the raw material and several conveyors. The Raw material is conveyed to the feed hopper to the boiler.

Emission Limits:

As previously stated, minimal opacity, 5 percent was observed from the drop point onto the fuel storage piles. No other opacity was observed in the fuel handling areas of the facility.

No Material Limits, Process/Operational Restrictions, Design/Equipment Parameters, Testing/Sampling, and Stack/Vent Restrictions, and Other requirements are required under EURMHANDLING.

Monitoring/Recordkeeping:

Based on the records reviewed, the fuel yard and handling operations are inspected on a daily basis when operating. If visible emissions are observed, appropriate procedures (like adding more water to the chips) are conducted to minimize the emissions.

Reporting:

Reporting of any deviations, quarterly reports, semi-annual reports, and annual compliance reports for ROP certification were submitted to the DEQ in timely manner.

EUBOILER:

A 230 MMBTU/hr wood and TDF fired spreader-stoker boiler that generates heat to produce steam that is used to generate a nameplate capacity 18 MW of electricity. Natural gas is fired during start-up of the boiler. As previously stated, the boiler uses a multiple cyclonic collector and an ESP for control.

Emission Limits:

DEQ received records of CO, NOx, and SO₂ in pound per MMBTU. The records indicate the actual emissions are below the permitted limits. CO is based on a 24-hour average and NOx and SO₂ are based on a 30-day rolling average, as permitted. DEQ reviewed the previous MAERS for 2013, and the constituents CO, Lead, NOx, PM-10, SO₂, VOCs, Arsenic, Mercury, Chromium, and Benzo(a)pyrene were below the permitted limits in tons per year. Additionally, DEQ reviewed the most recent relative accuracy test audit (RATA) and the flow rate to determine emissions in pounds per hour was 45,841 dry standard cubic feet per minute and the continuous emission monitoring systems (CEMS) passed the RATA. Based on the most recent stack test completed for the facility, completed October 7, 2010, the facility was below the permitted emission limits.

Material Limits:

Based on the records reviewed, the most amount of natural gas used since January 2014 was 23,867 ccf per 12-month rolling time period, which is below the 4,902,000 ccf per 12-month rolling time period permitted for the facility.

Based on the records reviewed, no construction and demolition wood, or particle board/plywood was received or burned at least since January 2014. The records indicated the facility received 15,809 tons of creosote wood based on a 12-month rolling time period, and the highest amount of creosote wood burned was 176 tons per 24-hour period since January 2014, which is below the 528 tons per day permitted for the facility. The records indicated the highest amount of TDF received at the facility was 12,567 tons of TDF based on a 12-month rolling time period since January 2014, and the highest amount of TDF burned was 40 tons per 24-hour period since January 2014, which is below the 44 tons per day permitted for the facility.

Process/Operational Restrictions:

Based on the records reviewed, the facility has operated 5,934 hours since January 2014. If the facility operates 24 hours a day until December 31, 2014, the facility is still under the permitted limit of 8,600 hours per year of operation.

During the walkover, the multiple cyclonic collector and ESP appeared to be operating properly.

Design/Equipment Parameters:

An annual RATA is performed to verify the CEM and COM systems are operating and monitoring the data properly. As previously stated above, the most recent RATA was completed August 7, 2014.

Testing/Sampling

DEQ reviewed the most recent analysis of each type of fuel burned at the facility. The results indicated chromium was 2.72 ppm for untreated (clean) wood chips, 13.9 ppm for creosote wood chips, and 0.2 ppm for TDF. Mercury was not detected above laboratory detection limits for clean wood chips and creosote wood chips, and was 0.05 ppm in TDF. These were below the permitted limits of 30 ppm for chromium and 0.5 ppm of mercury.

As previously stated, the most recent stack test was performed October 2010. The most recent annual exhaust gas flow rate testing was completed August 7, 2014, however AQD has not received the final report from the testing firm. The exhaust flow rate and RATA information used in this inspection report used the data from the August 22, 2013 report.

Monitoring/Recordkeeping

The facility has calculated hourly and annual emission rates using the most recent stack test data at the facility. The facility uses the most recent flow data and CEMS to calculate pound per hour emission rates. The CEMS monitors SO₂, CO, NO_x, and O₂. Additionally, the facility uses a COM to monitor opacity from the stack, which is used as an indicator of proper functioning of the electrostatic precipitator (ESP). The ESP is subject to compliance assurance monitoring (CAM), and is used to control PM from EUBOILER. The facility conducts quarterly quality assurance procedures of the CEMS and COM.

The facility calculates and records the total usage of natural gas. Records show that monthly and 12-month rolling time period natural gas records are kept accordingly.

The facility records the amount of fuel received and burned in the boiler system. The facility also keeps track of a 12-month rolling time period of the fuel received and burned in the boiler. The facility's records are well kept and keep daily boiler operating information in accordance with the ROP.

Based on the records reviewed, the highest opacity reading recorded of the boiler tack was 7.0 percent.

During the site inspection, the secondary voltage did not deviate more than 20 percent between the fields.

Based on the previous reports submitted to the DEQ, the Fourth Quarter report for 2013 indicated excess emissions for opacity were at 0.03 percent, for CO at 1.13 percent, and NO_x and SO₂ were at 0 percent. The First Quarter report for 2014 indicated excess emissions for opacity were at 0.01 percent, for CO at 0.88 percent, and NO_x and SO₂ were at 0 percent. The Second Quarter report for 2014 indicated excess emissions for opacity were at 0.05 percent, for CO at 3.96 percent, and NO_x and SO₂ were at 0 percent. The Third Quarter report for 2014 indicated excess emissions for opacity were at 0.03 percent, for CO at 0.14 percent, and NO_x and SO₂ were at 0 percent. In April 2014, during the Second Quarter, CO and opacity exceedances were due to a Consumers Energy direct transfer trip that isolated the plant from the grid. This caused the facility to operate in island mode for a period of 9 hours while repairs to the grid were being made. This caused high levels of O₂ which resulted in 8 high levels of CO hourly averages, and exceeded the 24-hour rolling average. During this period the plant also incurred 7 six-minute periods of opacity emissions in excess of 20 percent. When the grid repairs were fixed, and the plant returned to full power, the plant emissions for CO and opacity returned to compliance. Additionally, in May 2014, the plant had abnormal CO due to a plant trip, stoker grate malfunction, and start-up from an annual maintenance shut-down. Low gas pressure caused a delayed start-up. The facility reported the deviations and exceedances to the DEQ in a timely matter, and corrected the issues as soon as possible.

Reporting:

Reporting of any deviations, monitor downtime for the CEMS, quarterly reports, semi-annual reports, and annual compliance reports for ROP certification were submitted to the DEQ in timely manner.

The facility completes annual RATAs of the CEMS and COM for quality assurance monitoring. The RATAs have been completed in accordance with appropriate testing procedures, and the results were submitted accurately to the DEQ in a timely manner. The facility passed their most recent RATA which was completed August 7, 2014, however, as of the date of this inspection report, DEQ has not received the final 2014 RATA report.

Based on the date of the last stack test for the facility, another stack test should be completed within the next year.

Stack/Vent Restrictions:

Based on observations and DEQ's estimation during the field inspection, the stack (SVBOILER) appeared to be at least 150 feet tall and 72 inches in diameter. No visible emissions were observed from the stack during the inspection.

Other Requirements:

A Fuel Procurement and Handling Plan was submitted to the DEQ November 8, 2007 and approved by the DEQ May 28, 2008. The plan is implemented at the facility.

The facility is currently burning clean wood chips mixed with creosote wood chips and then combined with TDF. Based on the previous stack tests, Viking is within their permitted limits co-firing the fuels together. The facility appears to be in compliance with the on-site Emergency Response Program and CAM conditions outlined in the ROP.

EUASHHANDLING:

Fly ash and bottom ash are conveyed to a wet rotary unloader where water is added to control fugitive dust. The ash is then transported to an enclosed ash building where it is stored until the ash is trucked off-site.

Emission Limits:

No opacity was observed outside of the ash collection areas. The bottom ash is collected in a water pug mill, and disposed into a dumpster. The fly ash is collected in an enclosed building where the fly ash is conditioned with water and disposed of in a wagon that is brought to the ash building when full. The door to the enclosed building where the wagon is stored and the ash building remain closed until it is necessary to remove the ash from that location. Inside the building there was approximately 5 percent opacity inside, but no opacity was observed outside of the ash handling buildings.

No Material Limits, Process/Operational Restrictions, Design/Equipment Parameters, Monitoring/Recordkeeping, and Stack/Vent Restrictions, and Other requirements are required under EUASHHANDLING.

Testing/Sampling:

Based on the records reviewed, the ash handling and storage areas are inspected on a daily basis. If visible emissions are observed, appropriate procedures (like adding more water to the ash) are conducted to minimize the emissions.

Reporting:

Reporting of any deviations, quarterly reports, semi-annual reports, and annual compliance reports for ROP certification were submitted to the DEQ in timely manner.

EUGENERTOR :

A stand-by, diesel-fired, 415 hp emergency generator which is used to provide electricity to the facility during an emergency situation.

Emission Limits:

According to Mr. Vine, the sulfur dioxide emission rate does not exceed 0.56 pounds per MMBTU heat input, based on a 24-hour period (which is equivalent to using oil with 0.5 percent sulfur content and a heat value of 18,000 BTU's per pound. Based on the 2013 MAERS Report, the oil for the emergency generator had a heat value of 18,545 BTU per pound, and the sulfur content was 0.0015 percent. Records indicated the sulfur content of the fuel is 15 ppm sulfur.

No Material Limits, Testing/Sampling, and Stack/Vent Restrictions are required under EUGENERATOR.

Process/Operational Restrictions:

According to Mr. Vine, the emergency generator is tested approximately once per year, and has not operated more than 100 hours within a year.

Design/Equipment Parameters:

The emergency generator is equipped with a non-resettable hour meter. The generator has operated for 303 hours in the last 26 years at the time of the inspection.

Monitoring/Recordkeeping:

According to Mr. Vine, the emergency generator is tested once per year. The diesel generator was last used on May 13, 2014 during a power outage, and did not run for long.

Reporting:

Reporting of any deviations, quarterly reports, semi-annual reports, and annual compliance reports for ROP certification were submitted to the DEQ in timely manner.

Other Requirements:

The DEQ has not been given delegation for the RICE MACT, therefore this area was not addressed during the field inspection and records review.

FGCOLDCLEANERS:

Viking has one small cold cleaner located at the facility. It is serviced and maintained by Safety-Kleen and utilizes a mineral spirit solvent.

SUMMARY:

Based on DEQ's field inspection on August 9, 2014 and during the records review of the facility, DEQ finds the facility in compliance with ROP No. MI-ROP-N1160-2112 and associated plans for the facility.

NAME Caryn Owens

DATE 9/9/14

SUPERVISOR 