

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

B614559515

FACILITY: DTE Electric Company - Greenwood Energy Center		SRN / ID: B6145
LOCATION: 7000 KILGORE ROAD, AVOCA		DISTRICT: Warren
CITY: AVOCA		COUNTY: SAINT CLAIR
CONTACT: Austin Sash , Environmental Engineer		ACTIVITY DATE: 08/26/2021
STAFF: Kaitlyn Leffert	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: FY2021 Inspection		
RESOLVED COMPLAINTS:		

On August 26, 2021, I conducted a scheduled inspection of DTE Greenwood Energy Center (B6145), located at 7000 Kilgore Road, Avoca, MI. The purpose of the inspection was to determine the facility's compliance with the requirements of the Federal Clean Air Act; Article II, part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451); the administrative rules; and the conditions of Renewable Operating Permit (ROP) No. MI-ROP-B6145-2018.

Greenwood Energy Center is an electric generating facility that is permitted to operate one main 785 MW boiler, two auxiliary boilers, and three peaking units, as well as cold cleaners, a fire pump, and a gasoline dispensing tank. The source is considered to be a major source for emissions of nitrogen oxides (NOx), sulfur oxides (SOx), Volatile Organic Compounds (VOCs), and Hazardous Air Pollutants (HAPs). Section 1 of the facility's ROP covers the main electric generating unit, which includes the main boiler, auxiliary boilers, cold cleaners, and a fire pump engine. Section 2 covers the three natural gas-fired peaking units.

I initially contacted Jason Roggenbuck on August 19, 2021 to notify him that I would be visiting the facility and to request the required records. Jason identified that he was no longer the primary contact for the facility and that Austin Sash would take the lead on the air quality inspection. Mr. Sash emailed some of the requested records on August 25th. The remaining records were provided on the day of the inspection.

Site Inspection

I arrived at the facility and were greeted by Jason Roggenbuck and Austin Sash. We first went up to the office area, I explained the purpose of my visit and everything that I intended to see while on the site. I was also provided the remaining records that I had requested ahead of the inspection. Following this initial meeting, I was given a brief safety briefing and then led on a walk-through of the facility.

DTE Greenwood is considered a cycling plant and is used to fill long term gaps in electricity plant. There have not been any significant changes to the operation of the plant since the previous inspection in August 2019. Over the past 5-7 years, the plant has started running more frequently due to market demand.

We visited the main boiler room, where EUBOILER1 is located. The boiler was operating during my inspection. I also observed the East and West Auxiliary boilers. As noted during previous inspections, the West Auxiliary boiler has not operated at the facility in many years. During this

inspection, I confirmed that the West Auxiliary boiler remains to be inoperable. The East Auxiliary boiler is still used by the facility and was operating on the day of my inspection.

Prior to the inspection, I provided a list of the cold cleaners at the plant. The facility continues to operate the same two cold cleaners as before, one which is in the machine shop and the other on the first level of the plant. During my inspection, I observed both cold cleaners. I noted that the lids were closed, and operating instructions were clearly posted on both cold cleaners.

The facility has both a Continuous Emissions Monitoring Systems (CEMS) and Continuous Opacity Monitoring System (COMS), which measure emissions generated by the main boiler that exit through the main stack at the facility. The CEMS unit is required for SO₂ monitoring as specified in 40 CFR Part 75, Subpart B, and for NO_x monitoring as specified in 40 CFR Part 75, Subpart H. I reviewed the readout of the CEMS/COMS while at the facility. The readout showed the current SO₂ emission rate was 0.0 lb/hour and the current NO_x emission rate was 120 lb/hr. The SO₂ emissions are typically zero at the facility, due to the use of natural gas, rather than fuel oils, to power the plant. The COMS was reading 0% opacity the time of my inspection.

There is also a fire pump at the facility, which is for use in the case of emergencies. The emergency fire pump is powered by a Cummins Fire Power engines, which is subject to 40 CFR Part 60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. In order to satisfy the requirements of the NSPS, the fire pump engine is certified and a log of the hours that the engine operates is maintained by the facility. The fire pump has not yet been operated for use in emergencies, but it does run for approximately fifteen minutes per week to test it.

DTE Greenwood has a small gas pump on site, which is used for fueling DTE vehicles on the site. The gas pump has an associated 2,500 gallon gasoline underground storage tank. The gasoline dispensing equipment at this facility is subject to 40 CFR Part 63, Subpart CCCCC, National Emissions Standards for Hazardous Air Pollutants for Gasoline Dispensing Facilities. The Area MACT for gasoline distribution facilities specifies that efforts should be taken to minimize leaks, spills, or any vapor releases. In order to minimize the risk of spills or leaks, the ROP requires that the pump be equipped with a permanent submerged fill pipe and a vapor balance system. The gas pump is equipped with this equipment. During my inspection, I did not observe any signs of leaks, spills, or vapor releases in the vicinity of the gas pump.

Following our inspection of the main building of the facility, we visited the peaking units (FG-CTGS), which are located adjacent to the main building. The peaking units are three natural gas-fired simple-cycle turbines equipped with dry low-NO_x combustors. During my inspection, there were technical difficulties with opening the gate, so I observed these units from outside of the fence. However, all three units are fully observable from outside the fence line. During my inspection, all three peaking units were operating. I did not observe any visible emissions from these units.

While walking around outside the plant, I observed the stacks, including the large stack for the main boiler and the shorter stacks for the auxiliary boilers. I did not observe any visible emissions from any of the stacks.

Recordkeeping and Reports: Section 1

The following review of the provided records and reports is broken out by the corresponding emissions unit or flexible group for Section 1 of the ROP, which covers the main boiler and associated equipment in the main building of the facility.

Main Boiler

I was provided monthly records of heating value of oil fuels, heat input to the main boiler from natural gas and from oil fuels, sulfur content of oil fuels, total operating hours, and the quantity of fuels burned in the main boiler (EUBOILER1, S.C. VI.2). The fuel use records indicate that natural gas is the primary fuel burned in the main boiler and that No. 2 fuel oil is burned occasionally in small quantities. No. 6 fuel oil was only burned during the month of July during testing. In July 2021, monthly heat input from natural gas was 947,859 MMBTU and the boiler operated for 428 hours on natural gas. The heat input from No. 2 fuel oil was 478 MMBTU in July 2021 and the boiler was operated for 3 hours on No.2 fuel oil. No.6 fuel oil was only used in July of 2019, 2020, and 2021, which corresponds with times when testing of the boiler was completed. So far in 2021, the main boiler has operated for a total of 1,485 hours across all fuel types.

Compliance with the permitted SO₂, NO_x, and opacity emission limits for the main boiler is demonstrated through the CEMS and COMS (EUBOILER, S.C. I. 1, 3, and 4). The facility is required to submit semiannual reports of monitoring and deviations, as well as an annual certification of compliance. All required reports were previously submitted in a timely manner and demonstrated compliance with the ROP conditions.

Compliance with the particulate matter emission limit for EUBOILER1 (S.C. 2) is demonstrated through stack testing. The last PM Stack Test was completed on July 9, 2019. The results of the test indicated an emission rate of 0.001 lbs per 1,000 lbs of exhaust gases, which is in compliance with the permitted limit of 0.10 lbs/1,000 lbs.

S.C. I.1 sets a sulfur dioxide emission limit of the fuel to 0.80 lb per million Btu heat input. Compliance with this emission limit is based upon the CEMS. According to footnote (a) of the emission limit table, the emission limit is considered equivalent to using oil fuels with 0.78% sulfur content and a heat value of 19,390 Btu's per pound. The sulfur content of No. 2 fuel oil is 0.001% and the sulfur content of the No. 6 fuel oil is 0.62% sulfur. The heat value of the No.6 fuel oil is 17,490 Btu's per pound. Accounting for the differences in heat value, the prorated sulfur content of No. 6 fuel oil is approximately 0.69% sulfur content. The sulfur content of the No. 6 fuel oil appears to satisfy the permit conditions.

The ROP contains material limits on the quantity of halogens, lead, cadmium, chromium, arsenic, and PCBs in any specification used oil burned in the main boiler. The facility is not currently using any specification used oil, which is confirmed by the fuel use data records provided by the facility.

The main boiler also has an acid rain permit and is subject to the requirements of the transport rule (Appendices 9-1 and 10-1). Compliance with these programs is assessed by the Environmental Protection Agency (EPA).

East and West Auxiliary Boilers

Greenwood is required to keep monthly records of hours of operation, total volume of natural gas consumed, and heat input expressed in MMBtu for the East and West Auxiliary boilers. As

previously mentioned, the West Auxiliary Boiler is currently inoperable, so only records for the East Auxiliary boiler were provided. The auxiliary boilers are required to only run on natural gas. The provided records indicate that only natural gas was burned in the east auxiliary boiler.

The East Auxiliary boiler is subject to 40 CFR Part 63, Subpart DDDDD, National Emissions Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters (Boiler MACT). In order to comply with these standards, the facility is required to complete five year tune-ups and submit boiler tune-up reports to EPA (S.C. III.2, VII.5 and VII.6). In addition, the facility is to maintain records of each notification and report prepared to comply with the Boiler MACT standards (S.C. VI.4). I did not collect copies of these reports while on site and did not fully assess compliance with the Boiler MACT standards during this inspection.

According to the provided records, the east auxiliary boiler operated between 0 and 491 hours per month, from January 2019 through July 2021. In July 2021, the boiler operated for a total of 19.8 hours. The records indicate that the boiler operated for less hours in 2021 so far than it had in 2020 or 2019. Records of heat input and natural gas consumption were also provided. Heat input into the boiler ranged from 0 to 4,249 MMBTU from January 2019 through July 2021.

The facility is required to make regular visible emission (VE) observations at the auxiliary boilers and maintain records of these readings. Appendix 3-1.5 in the ROP specified the frequency at which visible emissions observations should be made, based on the operating hours of the unit in each week. Regardless of actual operating hours, DTE chooses to instead take daily VE readings, which is the maximum possible frequency which readings may be required by the ROP. I was provided records of the visible emissions readings, which indicate the date of the reading, whether the east and west auxiliary boilers operated that day, the number of hours the boilers operated, as well as the outcome of the VE observations. The provided records indicate that no visible emissions were observed during these daily VE readings from January 2019 through July 2021.

Cold Cleaners

Prior to my inspection, I was provided records that identified the model and serial numbers, installation date, air/vapor interface, Rule 201 exemption, Reid vapor pressure, and the type of solvent used at both of the cold cleaners located at the facility, as required by FG-COLDCLEANERS S.C. VI.2. Both of the cold cleaners use Zep Dyna 143 as the solvent. The Reid vapor pressure of each cold cleaner is 0.0097 psia. The ROP contains additional requirements if the Reid vapor pressure of the solvents exceeds 0.3 psia. S.C. IV.1 requires that the air/vapor interface for each cold cleaner be no more than 10 square feet. The provided records indicate that the air/vapor interface for the cold cleaner in the machine shop is 2.8 square feet, while the air/vapor interface for the one on the first floor is 5.5 square feet.

Rule 290 Exempt Sources

The facility is required to keep an inventory of emission units that are claiming a permit exemption under Rule 290, as well as records of the type and quantity of air contaminants emitted from these units. The facility does not have any emission units covered by this permit exemption, so did not have any such records.

Gasoline Distribution Area MACT

The gas pump at the facility is to be operated with a throughput less than 10,000 gallons per month, otherwise the equipment will become subject to additional regulatory requirements. The records provided by the facility indicate that monthly gasoline throughput ranged from 210.9 to 765.7 gallons per month over the previous two years.

Recordkeeping and Reports: Section 2

Section 2 of the ROP covers three natural gas-fired combustion turbine peaking units, which comprise one flexible group in the ROP (FG-CTGS). The units are subject to 40 CFR Part 60 Subpart A and Subpart GG. The emissions limits and associated testing, monitoring, and recordkeeping requirements in the ROP are used to demonstrate compliance with these federal standards. I was provided records of monthly and 12-month rolling NO_x, CO, formaldehyde, and PM emissions, as well as records of natural gas usage, total hours of startup and shutdown for each of three engines, capacity factors, and visible emission readings.

These peaking units are subject to 12-month rolling emission limits for nitrogen oxides (NO_x), carbon monoxide (CO), formaldehyde (HCHO), and particulate matter (PM-10). The following table summarizes the permitted 12-month rolling average permit emission limits, the 12-month rolling average as of July 2021, as well as the highest recorded 12-month rolling average for FG-CTGS. The highest 12-Month rolling average occurred in February 2019 for all pollutants.

Table 1: Annual Emission Limits Summary for FG-CTGS

Pollutant	12-Month Rolling Total Emission Limit (tpy)	12-Month Rolling Total as of July 2021 (tpy)	Highest 12-Month Rolling (tpy)
Nitrogen Oxides	522	13.86	28.65
Carbon Monoxide	856	16.41	32.81
Formaldehyde	9.9	0.21	0.42
Particulate Matter	102	1.54	3.15

In addition to the annual emissions limits, the permit also sets emission limits for NO_x and CO on a parts per million by volume (ppmv) basis, as well as a limit on particulate matter on a pounds per hour basis. Compliance with these emission limits is to be determined based on stack testing (S.C. V.1, V.2, and V.4). Stack testing of NO_x and CO emission rates is to be conducted every 20 calendar quarters. The most recent NO_x and CO emissions tests were conducted in October 2017

for 11-1 and 12-1 and in January 2018 for 11-2. The tests appeared to indicate compliance with the NOx and CO emission limits.

The ROP limits natural gas usage to 27,300 million cubic feet per 12-month rolling time total for FG-CTGS (S.C. II). In July 2021, 12-month rolling total natural gas usage was recorded to be 971.13 million cubic feet. The highest reported annual total occurred in February 2019 and was 1,946.45 million cubic feet.

FG-CTGS S.C. III.2 limits total hours of startup, shutdown, and malfunction to 500 hours per turbine, as determined on a 12-month rolling period. Total 12-month rolling hours of startup, shutdown, and malfunction in July 2021 were 24.4 for CTG 11-1, 21.8 for CTG 11-2, and 46.9 for CTG 12-1. The highest 12-month rolling total hours of startup, shutdown, and malfunction were observed in February 2019, with 76.6 hours for CTG 11-1, 75.2 hours for CTG 11-2, and 81.8 hours for CTG 12-1.

DTE Greenwood is required to maintain records of the capacity factor for each individual peaking unit (FG-CTGS S.C. VI.5). If the capacity factor for a single year exceeds 20% for an individual unit, or exceeds 10% averaged over three calendar years, then the facility is required to install a Continuous Emission Monitor System (CEMS) for NOx. The three year average capacity factors (2019 to 2021) are 3.7% for CTG 11-1 and 12-1, and 3.6% for CTG 11-2. The highest capacity factor for any individual engine for a single year over the previous five years was 7.2%, which was recorded for CTG 12-1 in 2018.

FG-CTGS also has a visible emission limit of 10% over a 6-minute average (S.C. I.4) and is required to maintain records of visible emission readings (S.C. VI.4). VE readings are required every 1,812 hours of operation. The most recent VE readings were conducted on July 27, 2020. There were not any visible emissions observed. The previous readings were conducted on April 3, 2018 and again, no visible emissions were observed.

Conclusion

Based on my inspection and review of the required recordkeeping, Greenwood Energy Center appears to be in compliance with all conditions of ROP-B6145-2018, as well as all applicable air quality rules and regulations.

NAME *Kaitlyn Jeffert*

DATE 09/30/2021

SUPERVISOR *K. Kelly*