

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

N160449270

FACILITY: Kent County Waste to Energy Facility		SRN / ID: N1604
LOCATION: 950 Market Ave SW, GRAND RAPIDS		DISTRICT: Grand Rapids
CITY: GRAND RAPIDS		COUNTY: KENT
CONTACT: April Lazzaro, Environmental Health and Safety Manager		ACTIVITY DATE: 06/25/2019
STAFF: Eric Grinstern	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Scheduled Inspection		
RESOLVED COMPLAINTS:		

FACILITY DISCRIPTION

The Kent County Waste-to-Energy (KWTE) Facility is located in the City of Grand Rapids, Kent County, Michigan. The plant is owned by Kent County Department of Public Works and operated by Covanta Energy. The facility is a 625 ton per day waste-to-energy facility firing municipal solid waste and natural gas operating two identical municipal solid waste mass burn waterwall combustors that can be co-fired with natural gas. The two combustors produce steam that is converted into electrical generation. Each combustor is equipped with a baghouse, a dry scrubber, a carbon injection system, and a selective non catalytic reaction system. Support equipment and operations on-site consist of ash and lime handling systems. The facility is located on the Grand River just southwest of downtown Grand Rapids. The immediate surrounding area is largely industrial.

The facility was constructed in 1989 and started operation in 1990. The facility currently employees approximately 47 workers and operates 24/7/365. The total facility rated output is 18 megawatts, with an actual output of 11-13 megawatts after parasitic consumption. The facility receives approximately 900-1,100 tons of waste a day, of which approximately 550 tons is burned. Excess waste received at the facility is sent to the landfill.

REGULATORY ANALYSIS

The facility is a Title V source, due to the potential to emit for criteria pollutants exceeds 100 tons and the potential to emit for a single HAP exceeds 10 tons and the potential to emit for combined HAPs exceeds 25 tons. The facility operates under Renewable Operating (ROP) Permit No. MI-ROP-N1604-2018, which was issued (renewed on May 14, 2018). The facility is subject to 40 CFR Part 62 Subpart FFF, Large Municipal Waste Combustors.

COMPLIANCE EVALUATION

The inspection was conducted over a period of three days, June 4, 2019, June 25, 2019 and June 26, 2019. The June 4, 2019, visit coincided with a USEPA, Region 5 led inspection at the facility. The June 25, 2019 and June 26, 2019 visits coincided with the annual compliance and RATA testing at the facility.

During the inspection, the facility was primarily represented by April Lazzaro, Environmental Health and Safety Manager. During the inspection conducted on June 4, 2019, the facility was also represented by Paul Smith, Waste to Energy Operations Manager, Kent County Department of Public Works.

SOURCE-WIDE CONDITIONS: FUGITIVE DUST CONTROL STRATEGY and CONSOLIDATED PLAN for WASTE and ODORS.

PROCESS/OPERATIONAL RESTRICTIONS/RECORDS

Requires the facility to implement the most recent Fugitive Dust Control Strategy as well as the most recent Consolidated Plan for Waste and Odors.

The Consolidated Plan for Waste and Odors outlines the facility's strategy for controlling odors. The plan is based on three elements, handling incoming MSW, facility design and operational procedures. The most recent plan was received on May 16, 2017. No recent odor complaints have been received by AQD regarding the facility. No odors were detected outside of the facility building while on the facility's property or off property.

The Fugitive Dust Control Strategy outlines potential sources of fugitive dust at the facility and control strategies to reduce fugitive dust. The most recent plan was received on May 16, 2017. As part of the facility's weekly environmental inspection, observations are conducted and recorded regarding odors, dust, roadways and roof vent fugitive dust. Weekly records for the six weeks prior to the June 24, 2019 were requested and received. Review of the records showed no unsatisfactory conditions documented.

EU-ASHSYSTEM

This emission unit includes the ash storage and handling equipment, and there is a separate ash handling system for each combustor. Rooftop ventilation of the enclosure is equipped with vent filters to control particulate emissions.

EMISSION LIMITS/RECORDKEEPING

The ash storage and handling equipment (including conveyor transfer points) is subject to visible fugitive ash emissions limit of up to 9 minutes per 3-hour period. The facility is required to conduct weekly visual inspections for opacity. The facility documents visible emission observations on the weekly environmental inspection form. Weekly records for the six weeks prior to June 24, 2019 were requested and received. Review of the records showed no fugitive dust from the roof vents being documented.

TESTING/SAMPLING

On an annual basis, the facility is required to conduct visible emissions testing for fugitive ash from EU-ASHSYSTEM, utilizing Method 22. The last time that VE testing was conducted, for which the results have been received, was June 26, 2018. VE readings were taken for three hours from three separate locations. No visible emissions were documented in the test results.

EU-LIMESYSTEM

Emission unit includes the pebble lime storage and handling equipment. The lime is contained in a vented storage silo that is equipped with a vent filter to control particulate emissions. The lime is used in the dry scrubber for acid gas control.

EMISSION LIMITS/MONITORING/RECORDKEEPING

Emission unit restricts particulate matter to 0.015 grains per dry standard cubic foot of exhaust gas, and opacity to 5%, based on a six minute average.

Compliance with the emission limits is based on the installation and proper operation of a bin vent filter on the storage silo. The facility is required to conduct monthly visual inspections for opacity while the unit is operating. Records were requested for the 6 months prior to the inspection. Review of the records showed that VE observations are conducted on a monthly basis during the receipt of lime. Additionally, the facility observed the lime silo on a weekly basis and records the results on the weekly environmental inspection report. Weekly records for the six weeks prior to June 24, 2019 were requested and received. Review of the records showed no unsatisfactory conditions documented.

EU-COOLINGTOWER

Emission unit includes the counter flow mechanical induced draft cooling tower with mist eliminators.

PROCESS/OPERATIONAL RESTRICTIONS

KWTE is required to install and operate mist eliminators. KWTE stated that the cooling tower is equipped with mist eliminators.

MONITORING/RECORDKEEPING

KWTE is required to conduct and log semiannual inspections to confirm that mist eliminators are installed and operating properly.

Semiannual inspection records were requested for the 2 years prior to June 24, 2019. The records received showing that the inspections were conducted on 9/29/2017, 11/7/2017, 6/1/2018, 11/1/2018 and

5/2/2019. In 2017 the facility met the "semiannual" frequency requirement, but conducted the inspections less than 2 months apart. Staff will discuss with the facility conducting the inspections closer to 6 months apart.

FG-COMBUSTORS

This flexible group includes the two identical municipal solid waste mass burn waterwall combustor units. Each unit is equipped with a baghouse, a dry scrubber, a carbon injection system and a selective non-catalytic reduction system.

EMISSION LIMITS

Compliance testing for ROP established emission limits are required to be conducted annually, alternating between Unit 1 and Unit 2. During the most recent testing in 2019, Unit 1 was tested. Additionally, a subset of pollutants for Unit 2 along with Subpart Cb testing was conducted for Unit 2. Review of the test results demonstrated compliance with the permitted emission limits. Review of the full compliance test conducted in 2018 for Unit 2 showed compliance with the permitted emission limits.

Results of testing conducted in June 2019 document compliance with the applicable limits, however, a final determination will not be made until completion of review by TPU, which is pending.

Pollutant	Limit (each unit)	Actual Emissions	Compliance Yes/No
1. Particulate Matter (PM)	25 mg/dscm, corrected to 7% oxygen	2019 Stack Test Unit 1: 0.364 mg/dscm corrected to 7% oxygen	Yes
2. Particulate Matter (PM)	0.010 grain/dscf, corrected to 7% oxygen	2019 Stack Test Unit 1: 0.0000159 gr/dscf corrected to 7% oxygen	Yes
3. Particulate Matter (PM)	2.6 pounds per hour	2019 Stack Test Unit 1: 0.0417 pounds per hour	Yes
4./5. Opacity	10%	2019 Stack Test Unit 1: COMS readings: 0% CEMS Unit 1: 0 Unit 2: 0 (observed during inspection)	Yes
6. Sulfur	29 ppmv on a	2019 Stack Test	YES

Dioxide (SO ₂)	dry basis (ppmvd), or 25% of uncontrolled emissions, whichever is less stringent, corrected to 7% oxygen	Unit 1: 5 ppmvd	
7. Sulfur Dioxide (SO ₂)	50 ppmvd, or 25% of uncontrolled emissions, whichever is less stringent, but not to exceed 75 ppmvd, corrected to 7% oxygen	2019 Stack Test Unit 1: 5 ppmvd	YES
8. Sulfur Dioxide (SO ₂)	15 pounds per hour, or 25% of uncontrolled emissions, whichever is less stringent, but not to exceed 22.45 pounds per hour	2019 Stack Test Unit 1: 1.62 pounds per hour	YES
9. Oxides of Nitrogen (NO _x)	205 ppmvd, corrected to 7% oxygen	CEMS (observed during inspection) Unit 1: 184 ppmvd Unit 2: 170 ppmvd	YES
10. Oxides of Nitrogen (NO _x)	400 ppmvd, corrected to 7% oxygen	2019 Stack Test Unit 1: 181 ppmvd CEMS (observed during inspection) Unit 1: 190 ppmvd	YES

	meter, corrected to 7% oxygen	<0.108 milligrams per dscm	
26. Total Fluorides	0.28 pound per hour	2019 Stack Test Unit 1: <0.0124 pounds per hour	YES
27. Non-methane Hydrocarbons	8.3 milligrams per dry standard cubic meter, corrected to 7% oxygen	2019 Stack Test Unit 1: 1.10 milligrams per dscm	YES
28. Non-methane Hydrocarbons	0.94 pound per hour ²	2019 Stack Test Unit 1: 0.133 pounds per hour	YES
29. Lead (Pb)	0.400 milligram per dry standard cubic meter, corrected to 7% oxygen	2019 Stack Test Unit 1: 0.00969 milligram per dry standard cubic meter	YES
30. Lead (Pb)	0.87 milligram per dry standard cubic meter, corrected to 7% oxygen	2019 Stack Test Unit 1: 0.00211 milligram per dry standard cubic meter	YES
31. Lead (Pb)	0.10 pound per hour	2019 Stack Test Unit 1: 0.000241 pound per hour	YES
32. Mercury (Hg)	0.050 milligram per dry standard cubic meter, or 15% of potential emissions, whichever is less stringent, corrected to 7% oxygen	2019 Stack Test Unit 1: 0.00193 milligram per dscm	YES
33. Mercury (Hg)	0.61 milligram per dry standard cubic meter, corrected to 7% oxygen	2019 Stack Test Unit 1: 0.00193 milligram per dscm	YES
34. Mercury (Hg)	0.07 pound per hour	2019 Stack Test Unit 1: 0.000219	YES

		Unit 2: 186 ppmvd	
11./12. Oxides of Nitrogen (NO _x)	86 pounds per hour when firing MSW	2019 Stack Test Unit 1: 39.9 pounds per hour	YES
13. Oxides of Nitrogen (NO _x)	350 ppmvd, corrected to 7% oxygen	2019 Stack Test Unit 1: 187 ppmvd	YES
14./15. Oxides of Nitrogen (NO _x)	75.25 pounds per hour when firing MSW	2019 Stack Test Unit 1: 36.9 pounds per hour	YES
16. Carbon Monoxide (CO)	100 ppmvd, corrected to 7% oxygen	2019 Stack Test Unit 1: 9 ppmvd	YES
17. Carbon Monoxide (CO)	200 ppmvd, corrected to 7% oxygen	2019 Stack Test Unit 1: 13 ppmvd	YES
18./19. Carbon Monoxide (CO)	26.05 pounds per hour when firing MSW	2019 Stack Test Unit 1: 1.74 pounds per hour	YES
20. Carbon Monoxide (CO)	50 ppmvd, corrected to 7% oxygen	2019 Stack Test Unit 1: 9 ppmvd CEMS (observed during inspection) Unit 1: 8 ppmvd Unit 2: 22 ppmvd	YES
21./22. Carbon Monoxide (CO)	6.51 pounds per hour when firing MSW	2019 Stack Test Unit 1: 1.22 pounds per hour	YES
23. Hydrogen Chloride (HCl)	29 ppmvd, or 5% of uncontrolled emissions, whichever is less stringent, corrected to 7% oxygen	2019 Stack Test Unit 1: 20.0 ppmvd	YES
24. Hydrogen Chloride (HCl)	8.55 pounds per hour	2019 Stack Test Unit 1: 3.52 pph	YES
25. Total Fluorides	2.5 milligrams per dry standard cubic	2019 Stack Test Unit 1:	YES

35. Sulfuric Acid Mist	39 milligrams per dry standard cubic meter, corrected to 7% oxygen	2019 Stack Test Unit 1: <0.0663 milligrams per dscm	YES
36. Sulfuric Acid Mist	4.4 pounds per hour	2019 Stack Test Unit 1: <0.00795 pounds per hour	YES
37. Arsenic (As)	6.2 micrograms per dry standard cubic meter, corrected to 7% oxygen	2019 Stack Test Unit 1: <0.158 micrograms per dscm	YES
38. Arsenic (As)	7.0×10^{-4} pound per hour	2019 Stack Test Unit 1: < 1.78×10^{-5} pound per hour	YES
39. Beryllium (Be)	0.16 microgram per dry standard cubic meter, corrected to 7% oxygen	2019 Stack Test Unit 1: <0.0394 microgram per dry standard cubic meter	YES
40. Beryllium (Be)	1.83×10^{-5} pound per hour	2019 Stack Test Unit 1: < 4.46×10^{-6}	YES
41. Cadmium (Cd)	35 micrograms per dry standard cubic meter, corrected to 7% oxygen	2019 Stack Test Unit 1: 0.284 micrograms per dscm	YES
42. Cadmium (Cd)	37 micrograms per dry standard cubic meter, corrected to 7% oxygen	2019 Stack Test Unit 1: 0.284 micrograms per dscm	YES
43. Cadmium (Cd)	4.17×10^{-3} pound per hour	2019 Stack Test Unit 1: 3.21×10^{-5} pound per hour	YES
44. Hexavalent Chromium	4.2 micrograms per dry standard cubic meter, corrected to	2019 Stack Test Unit 1: 0.333 micrograms per dry standard cubic meter	YES

	7% oxygen		
45. Hexavalent Chromium	4.69 x 10 ⁻⁴ pound per hour	2019 Stack Test Unit 1: 3.82 x 10 ⁻⁵ Pound per hour	YES
46. Municipal Waste Combustor Organic Compounds, expressed as total mass dioxins/furans	30 nanograms per dry standard cubic meter, corrected to 7% oxygen	2019 Stack Test Unit 1: 1.00 nanograms per dscm	YES
47. Total Polychlorinated Dibenzo-p-dioxins (PCDD) and Total Polychlorinated Dibenzo-furans (PCDFs) including all tetra through octa isomers	3.0 nanograms per dry standard cubic meter, expressed as 2,3,7,8 TCDD toxic equivalents using factors in Appendix 5, corrected to 7% oxygen	2019 Stack Test Unit 1: 0.00376 nanograms per dscm	YES
48. Total Polychlorinated Dibenzo-p-dioxins (PCDD) and Total Polychlorinated Dibenzo-furans (PCDFs) including all tetra through octa isomers	3.38 x 10 ⁻⁷ pound per hour, expressed as 2,3,7,8 TCDD toxic equivalents using factors in Appendix 5	2019 Stack Test Unit 1: 4.35 x 10 ⁻¹⁰ pound per hour	YES

MATERIAL LIMITS

Steam Load

The steam load of each combustor is limited to 81,000 pounds of steam per hour, based on a four-hour block average.

The steam load average at the time of the inspection was 78,000 for Unit 1, and 75,900 for Unit 2 (per hour based on a four-hour average).

Under the MACT the facility is allowed a steam flow rate of 10% greater than that achieved during stack testing, establishing a limit of 84,000 pounds per hour for each unit. Since the facility has not documented and exceeded the state limit of 81,000 pounds, and therefore had not exceeded the MACT limit.

Natural Gas Usage

Each combustor is limited to 59,524 cubic feet per hour (scfh).

Records of the highest hourly usage for the previous 12 months was requested and supplied by the facility. Unit 1 had an hourly high of 57,918 cubic feet per hour. Unit 2 had an hourly high of 57,642 cubic feet per hour.

Natural gas usage is limited to 104,000,000 cubic feet per calendar year per unit.

Natural gas usage for 2018, per records provided by the facility, was: Unit 1: 18,760,000 cubic feet, Unit 2: 16,180,000 cubic feet

The maximum baghouse (inlet) temperature determined during the 2018 stack test based on a 4-hour arithmetic average, with the allowed +30°F, was 352 °F for Unit 1 and 350 °F for Unit 2.

Review of the requested records for the time period of June 17, 2019 through July 7, 2019, showed there to be no 4-hour temperature averages over the established maximums for either Unit 1 or Unit 2.

The permit allows for the waiver of the mass carbon feed rate during the annual D/F test and the 2 weeks preceding the test, upon approval by AQD. During testing on Unit 1, it was observed that the carbon feed rate was 9.3 pounds on an 8hr average. This is less than the minimum rate (9.5 pounds) established during testing in 2018. Staff is not aware of a waiver being granted for the carbon feed rate.

PROCESS/OPERATIONAL RESTRICTIONS

Process and operational restrictions include the following:

- dry scrubber and baghouse installed, maintained and operating
- selective non-catalytic reduction system installed, maintained and operating
- carbon injection system installed, maintained and operating
- only sweet natural gas as an auxiliary fuel
- establish the maximum unit load during D/F testing using the highest 4-hour average
- establish the particulate matter control device temperature during testing using a 4-hour block period plus 30 degrees.

Based on this inspection and information provided by the facility, the facility is complying with the process/operational restrictions.

DESIGN/EQUIPMENT PARAMETERS

The facility is required to install a lime slurry feed that automatically modulated and interfaces with the SO₂ CEMS as required. The permittee is also required to installed, calibrate, maintained and operated a continuous temperature monitoring device at the inlet of each baghouse.

Based on this inspection, the facility is in compliance with the above requirements.

TESTING/SAMPLING

On an annual basis, the permittee conducts testing as required by the permit, alternating between Unit 1 and Unit 2 each year to verify compliance with the emission limits. All stack test methodology is reviewed and evaluated by the AQD Technical Programs Unit staff, who attend testing as well to ensure its validity.

MONITORING/RECORDKEEPING

Much of the monitoring/recordkeeping is evaluated by the AQD Technical Programs Unit with regards to the Continuous Emissions Monitoring Systems (CEMS) and those requirements. At this time, it is believed that all the CEMS requirements are being met.

In addition to the CEMs and COMs requirements, monitoring of the process and control equipment parameters are detailed. Based on this inspection, including the information provided and reported by the facility, they appear to be in compliance with the monitoring and recordkeeping requirements.

REPORTING

The facility is submitting the required reports in a timely manner.

STACK/VENT RESTRICTIONS

The stacks were not physically measured however no changes have been made.

FG-CIRICEMACT

Currently the facility operates one engine subject to the compression ignition reciprocating internal combustion engine (RICE) maximum achievable control technology (MACT). This engine was observed in the engine house and has a non-resettable hour meter. Oil changes are conducted quarterly whether required or not, and it is operated weekly to ensure reliability.

FG-CIRICENSPS

Currently the facility operates one engine subject to the CIRICE new source performance standard (NSPS). This engine was observed in the engine house and is also equipped with a non-resettable hour meter. Oil changes are conducted quarterly whether required or not, and it is operated weekly to ensure reliability.

Appendix 1a

Appendix 1a was incorporated into the permit at origination so that there would be no differences in terminology or how to interpret and determine compliance with the various requirements.

CONCLUSION

Kent County Waste-to-Energy Facility appeared to be in compliance with applicable air quality rules and regulations at the time of the inspection.

Note: A final determination regarding the acceptance of the June 2019 performance testing is pending until the completion of review by TPU.

NAME



DATE

9/30/19

SUPERVISOR

