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

B179257420

FACILITY: Warren Waste Water Treatment Plant		**SRN / ID:** B1792
LOCATION: 32360 Warkop, WARREN		**DISTRICT:** Warren
CITY: WARREN		**COUNTY:** MACOMB
CONTACT: Bryan Clor , Facility Director		**ACTIVITY DATE:** 03/22/2021
STAFF: Robert Joseph	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: Scheduled Inspection of Wastewater Treatment Plant		
RESOLVED COMPLAINTS:		

On March 22, 2021, I, Michigan Department Environment, Great Lakes, and Energy-Air Quality Division staff Robert Joseph, conducted a scheduled inspection of Warren Wastewater Treatment Plant, Inc. (SRN: B1792) located at 32360 Warkop Avenue, Warren, Michigan 48093. The purpose of the inspection was to determine the facility's compliance with the requirements of the Federal Clean Air Act; Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451; and the Michigan Department Environment, Great Lakes, and Energy-Air Quality Division (EGLE-AQD) Administrative Rules, and conditions of the facility's Renewable Operating Permit (ROP) MI-ROP-B1792-2016.

General Facility Information

The Warren Wastewater Treatment Plant (WWTP) treats residential wastewater from the city of Warren as well as from industrial sources. WWTP was constructed in the late 1950s. The facility's sewage sludge incinerator is subject 40 CFR 60, Subpart MMMM, Emission Guidelines and Compliance Times for Existing Sewage Sludge Incineration Units. This subpart is for all Sewage Sludge Incinerators that commenced construction before October 14, 2010. In addtion, the facility is subject to 40 CFR Part 61, Subpart C and E of the National Emission Standards for Hazardous Air Pollutants (NESHAP).

I arrived at the facility at approximately 1:30 p.m. and met with Bryan Clor, Facility Director. I introduced myself and presented my identification and credentials and stated the purpose of my visit.

I asked Bryan to provide some general information regarding the plant. The facility processes approximately 22 million gallons of wastewater a day and operates three shifts with approximately 41 employees: 7am-3pm, 3pm-11pm, and 11pm-7am. The maximum capacity of the plant is 100 million gallons per day. The wastewater undergoes a series of processes once it enters the facility through a gravity fed system which includes a wet well, grit chamber, primary clarifiers, aeration tanks, secondary clarifiers, tertiary treatment, UV disinfectant, belt presses, and an incinerator.

Facility Tour

I met with Mr. Robert Dranberg, Chief Operator, who led me on a tour of the facility. Mr. Dranberg stated there are redundant pumps within the system which guides the wastewater as it enters the wet well where the treatment begins. Exhaust from the wet well is treated using chemical odor control through the usage of sodium hypochlorite (NaOH). The facility replaced the bar screens of the wet well from 2 inches to 5/8 inch in 2019 to improve the capture of large debris which can damage the pumps. The wet well process is an enclosed process, and the pH and water flow rate are monitored through the Envirocare Venturi wet scrubber.

The wastewater then enters the grit box which also is an enclosed process and it runs 24 hours a day and is also equipped with odor control. It is composed of a chamber and split box. Prior to entering the atmosphere, the exhaust air is captured and treated through a carbon adsorption treatment unit when the wastewater temperature is above 60 ^{o}F. This typically occurs around May or June. Potassium permanganate ($KMnO_4$) is used to remove the iron (Fe) and hydrogen sulfide (H_2S) from the wastewater and to detect for activated carbon breakthrough from the grit box. The facility monitors the pH of the wastewater as it enters the facility. Some residual waste from the grit box is sent to a landfill.

The wastewater then enters a primary clarifier which are tanks used to slow the velocity of the wastewater to allow the suspended solids to settle. The facility performs a daily density test to determine the settling time of the particles in the tank. The primary sludge is collected, and the tanks are cleaned yearly. The facility maintains eight primary clarifiers. Some of the sludge is removed and stored as activated sludge within storage tanks.

The wastewater is routed to aeration tanks where air is introduced to allow for aerobic digestion of the pollutants which allows the solids to easily settle. The facility has six aeration tanks with four in service. The wastewater then moves to a series of secondary clarifiers where bio-phosphorus removal occurs, and where the effluent from the wastewater is held for a specified time allowing the activated sludge to settle to the bottom of the tank. The facility maintains eight secondary clarifiers. This activated sludge then moves to two of the three belt presses within the facility. The third belt press is available should any one of the other two become unavailable.

The final treatment phase of the wastewater is the tertiary treatment process which improves the wastewater quality before it is discharged into the Red Run Drain. This process removes all remaining inorganic compounds. The facility applies an ultraviolent (UV) light treatment to the cleansed wastewater before it is routed to the nearby Red Run Drain. The (UV) light treatment consists of a series of UV bulbs which destroy the genetic material of micro-organsims rendering them sterile.

The remaining sludge from the tanks are sent to one of three filter belt presses which are fed into a gravity belt thickener. These belts are used to reduce the moisture of the sludge to a ratio of 80% water/20% solid. There are a series of intake vents with filters. Air is drawn into the carbon adsorption unit for the belt press due to the possible hydrogen sulfide (H_2S) emissions. The carbon adsorption unit changes color when it is time for the unit to be changed indicating (H_2S) has broken through.

This dewatered sludge is then directed towards the facility's Nichols multi-hearth incinerator. The facility typically sends sludge to the incinerator 3-4 days a week. The incinerator consists of ten hearths with burners located on hearths 2, 4, 6, 8, and 10. The facility monitors the combustion chamber temperature in hearths 5, 6, and 7. The facility inspects the incinerator hearths yearly. The design capacity of the incinerator is 10 tons/hr with a typical sludge feed rate of 4 to 6 tons/hr which is established with each performance test. The sludge feed rate is currently 5.47 tons/hr and is monitored through the facility's water permit by the EGLE-Water Resource Division.

The incinerator temperature increases at a rate of 50 ^{o}F per hour. The control device used to control emissions for the incinerator is a 3-stage EnviroCare Venturi wet scrubber. The facility does not add any chemical compounds to the scrubber to control the pH of the waste. The incinerator contains a bypass which is located on the top floor of the incinerator which lets fresh air in. The bypass only opens when maintenance work is occurring or when the incinerator ID fan fails. The bypass is attached to dead weights and will sound an alarm when opened. The ID fan was installed at the same time as the scrubber and aids in combustion according to the facility. The stack has continuous emission monitoring (CEM) for total hydrocarbons and an oxygen monitor, both monitored through their water permit.

The ash from the incinerator is mixed in with some water and is discharged into the on-site lagoon. The lagoon is cleaned twice a year and the waste material is shipped to a landfill for burial.

Renewable Operating Permit: MI-ROP-B1792-2016. All applicable emission unit sections verified during inspection are referenced below.

EU-INCINERATOR and EU-INCINERATOR-NSPS-MMMM

EU-INCINERATOR (conditions prior to the facility being subject Subpart MMMM) contains the same conditions since EU-INCINERATOR-NSPS-MMMM.

I. Emission Limits (performance tests conducted July 16-17, 2020). I.2 (Mercury) and I.3 (Beryllium) are referenced under the Section VI. Monitoring/Recordkeeping since their Time Period/Operating Scenario is daily.

Pollutant	Limit	Test Result
1. Particulate Matter (PM)	0.2 lbs per 1,000 lbs of exhaust air, corrected to 50% excess air	0.0048 lbs
4. Particulate Matter (PM)	80 mg/m^3 (dry standard)	6.15 mg/m^3

Pollutant	Limit	Test Result
5. Hydrogen chloride	1.2 ppmv (dry)	0.56 ppmv
6. Carbon monoxide	3,800 ppmv (dry)	2,340 ppmv
8. Dioxins/furans (total equivalency basis) b, c	0.32 ngs/m^3 (dry standard)	0.026 ng/m^3
9. Mercury	0.28 mg/m^3 (dry standard)	0.045 mg/m^3
10. Oxides of nitrogen	220 ppmv dry (dry)	185 ppmv
11. Sulfur Dioxide	26 ppmv (dry)	2.2 ppmv
12. Cadmium	0.095 mg/m^3 (dry standard)	0.004 mg/m^3
13. Lead	0.30 mg/m^3 (dry standard)	0.027 mg/m^3
14. Fugitive Emissions from ash handling	Visible emissions of combustion ash shall be no more than 5 percent for the hourly observation period	0%

III. PROCESS/OPERATIONAL RESTRICTIONS

According to Mr. Dranberg, the facility operates the EnviroCare Venturi scrubber whenever the incinerator is operating, and the bypass is only operated when the ID fan fails and when maintenance work is performed on the scrubber.

IV. DESIGN/EQUIPMENT PARAMETERS

The facility maintains an electronical monitoring device which continuously records and monitors the incinerator combustion chamber temperature and sewage sludge feed rate. Also, the EnviroCare Venturi scrubber pH, pressure drop, and liquid flow rate are also continuously monitored. The facility's most recent performance test (June 2020) set the following operating limits:

-Incinerator minimum combustion chamber temperature (hearths #4, #5, #6): 1346 F
-Sewage sludge maximum feed rate: 5.47 tons/hr (131.28 tons/day)
-Scrubber liquid pH limit (minimum): 6.26
-Scrubber liquid flowrate (minimum): 806 gal/min
-Scrubber minimum pressure drop (minimum): 24.29 inches H_2O

V. TESTING/SAMPLING

The facility analyzes both the mercury and beryllium content of the sludge feed to the incinerator monthly as provided by facility records, and the mercury and beryllium content of the ash from the incinerator once a year with the most recent test occurring in September 2020. The facility has chosen to show continuous compliance with emission limits using performance testing. The most recent test occurred in June 2020 which established the operating limits for minimum combustion temperature, sewage sludge feed rate, scrubber liquid pH, scrubber liquid flow rate, and pressure drop across the scrubber.

VI. MONITORING/RECORDKEEPING

Records indicate the mercury content of the sludge feed to the incinerator varies from 1.5 - 5.8 grams/day in 2019 and 2020. The permit limit is 3200 grams/day. Records indicate the beryllium content of the sludge feed

to the incinerator varies from 3.0 - 8.8 grams/day in 2020 and 2021. Permit limit is 10 grams/day. The daily sewage sludge feed to the incinerator varied from 0 - 140 tons/day during that time span.

Mr. Dranberg indicated the transducer is calibrated annually and was calibrated last spring. The differential pressure of the scrubber is monitored continuously. The sewage sludge feed rate at the time of inspection was 0 tons/hr given the incinerator was not operating at the time of inspection. Records indicate the daily average sewage sludge feed rate ranging from 2 - 5 tons/hr on operational days. The facility also monitors and records the moisture content of the sewage sludge by obtaining multiple daily grab samples of the sewage sludge. The daily average moisture content for the samples is calculated and records indicate it ranging between 80% - 86% moisture.

The facility monitors and records the combustion chamber temperature for the Incinerator on a continuous basis and it is recorded every 15 minutes. The following temperatures were viewed electronically via the facility's database during the inspection while the incinerator was in stand-by mode:

Hearth 1: 833 F; Hearth 2: 989 F; Hearth 3: 1084 F; Hearth 4: 1247 F; Hearth 5: 1212 F; Hearth 6: 1362 F; Hearth 7: 923 F; Hearth 8: 970 F; Hearth 9: 269 F; Hearth 10: 110 F

Facility electronic records indicate the incinerator hearths (4, 5, and 6) are meeting the established operating limit when the incinerator is operating.

The facility has submitted a site-specific monitoring plan for each continuous monitoring system, and monitors and records the pressure drop across the scrubber, scrubber liquid flowrate, and scrubber liquid pH for the incinerator on a continuous basis and they are each recorded every 15 minutes. Facility electronic records at the time of inspection indicated the liquid scrubber flowrate was 0 gal/min with a non-operational temperature of 62 ^{o}F. In addition, the pressure measured 23.8 inches H_2O and displayed a pH of 7.1.

Facility electronic records indicate the parameters are operating within the established operating limits while the scrubber is in operation, however, the scrubber fluid pH fell below the operating limit five times during the 2nd half of 2020 (July - Dec). These were recorded as deviations which lasted up to an hour and Mr. Clor was advised that future deviations would be subject to violation. It was suggested the facility add a base chemical compound such as Sodium Hydrogen Carbonate ($NaHCO_3$) or Magnesium Hydroxide ($MgOH)_2$ to increase the alkalinity of the fluid.

Lastly, there appeared to be zero opacity emanating from the stack.

Belt Press

III. PROCESS/OPERATIONAL RESTRICTIONS

The pressure differential unit is maintained to ensure the pressure drop is below 10 inches H_2O. A reading of 1.0 inches H_2O was observed on the digital screen and logged by the facility.

IV. DESIGN/EQUIPMENT PARAMETERS

The carbon adsorption unit is maintained and installed, and a pressure drop indicates maintenance must occur. The carbon adsorption unit is maintained and replaced according to a color code change from purple (new) to black (H_2S breakthrough) indicating that replacement is necessary. The unit was last changed in April 2020. The facility maintains a supply of ductwork air intake filters on-site available for replacement and are replaced bi-annually.

VI. MONITORING/RECORDKEEPING

The color changes of the carbon adsorption unit are monitored frequently by staff color and documented. Records show readings have occurred monthly. The facility indicated the air intake filters were recently changed last month in February.

Wet Well

III. PROCESS/OPERATIONAL RESTRICTIONS

The wet well operates continuously and is an enclosed system. The oxidative scrubber is installed and appears to operate per the manufacturer's specification. The area is vented with two axial fans and is equipped with liquid flow meter and a pH meter. In addition, the chemical feed system is monitored electronically and can be adjusted. The pH logbook did not indicate any readings to be below 7.0 the last two years and the facility maintains a corrective action plan should the pH fall below that.

VI. MONITORING/RECORDKEEPING

The facility continuously monitors the scrubber on a daily basis and can adjust the chemical feed as necessary. The pH at the time of inspection was 8.8 and wet well level was 16.1 feet. The facility is equipped with eight pumps that provide wastewater to the grit chamber and all pumps were in operation.

Grit Box

III. PROCESS/OPERATIONAL RESTRICTIONS

The facility operates the blower when the wastewater temperature is above 60 ^{o}F. The facility indicates this generally occurs in the late Spring. The grit chamber and splitter box are covered at all times. The grit chamber screen size openings were replaced in 2019 from 2 inches to 5/8 inch. The facility's activated carbon adsorption canister controls the blower (odor control fan) from the grit chamber through the use of potassium permanganate ($KMnO_4$).

VI. MONITORING/RECORDKEEPING

The facility continuously monitors the wastewater temperature and records indicate the blower has been in operation this fiscal year (typically occurs late May/early June). The facility monitors the carbon adsorption canister for H_2S breakthrough on a weekly basis and was in the process of replacing the unit .

Generator

III. PROCESS/OPERATIONAL RESTRICTIONS

Per Subpart ZZZZ (NESHAP for Stationary Reciprocating Internal Combustion Engines), the facility shall not operate the existing emergency stationary RICE (EUGenerator) with a site rating of more than 500 brake HP located at a major source of HAP emissions, for more than 15 hours per calendar year for the purposes specified in 40 CFR 63.6640(f)(2)(ii) and (iii).

According to the facility logbook it has not operated for more than 15 hours per calendar year. It is a 2.1 MW generator and is used only during power outages.

VI. MONITORING/RECORDKEEPING

According to the facility the generator is from the early 1970s and uses diesel fuel. A logbook detailing the maintenance work performed on the generator is maintained which includes oil changes, battery checks, and air intake louver checks. The facility appears to be in-compliance with the permit requirements per the record logbook on-site.

House Generator

III. PROCESS/OPERATIONAL RESTRICTIONS

The facility maintains an 82 hp generator on site and it was installed approximately 12 years ago. It is used to start backup power for EUGenerator after total loss of power. The facility maintains that this is a certified engine and maintains a logbook of all maintenance work performed on the generator. The initial performance test of the engine indicated the NOx to be below the permit limit of 6.9 g/HP-hr.

VI. MONITORING/RECORDKEEPING

The facility records the hours each time the generator has been in use. In addition, the facility indicates it is only used for emergency purposes when there is a total loss of power to the facility. Records show this occurred during major storms and for less than five hours over the last year. The facility logs the annual inspection, diesel fuel usage, and oil changes as part of its recordkeeping and maintains the sulfur content of the fuel (ultra-low sulfur diesel) is 10 ppm through safety data sheets from the manufacturer.

Coldcleaners

II. MATERIAL LIMITS

The facility does not use any of the compounds listed as indicated on the SDS.

III. PROCESS/OPERATIONAL RESTRICTIONS

The washer was not in use at the time of inspection.

IV. DESIGN/EQUIPMENT PARAMETERS

The washer was closed during the time of inspection. The air/vapor interface appeared to be less than ten square feet and is equipped with a device for draining parts. This is exempt per Rule 281(2)(h).

VI. MONITORING/RECORDKEEPING

The facility washer is manufactured by Safety Kleen Corporation, Inc. and appears to be in-compliance with all applicable rules.

Conclusion

Based on the AQD inspection and records review it appears the Warren Wastewater Treatment Plant is in compliance with the aforementioned requirements and all remaining conditions (timely MAERS submittal, Annual and Semi-annual report noting deviations which occurred) of the facility's ROP MI-ROP-B1792-2016.

NAME Robert Joseph DATE 06-07-21 SUPERVISOR K. Kelly