

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

N384555212

<b>FACILITY:</b> EAGLE VALLEY RECYCLE AND DISPOSAL FACILITY		<b>SRN / ID:</b> N3845
<b>LOCATION:</b> 600 W. SILVER BELL RD., ORION TWP		<b>DISTRICT:</b> Warren
<b>CITY:</b> ORION TWP		<b>COUNTY:</b> OAKLAND
<b>CONTACT:</b> Rich Paajanen , Engineering Manager		<b>ACTIVITY DATE:</b> 09/29/2020
<b>STAFF:</b> Robert Joseph	<b>COMPLIANCE STATUS:</b> Compliance	<b>SOURCE CLASS:</b> MAJOR
<b>SUBJECT:</b> Scheduled inspection of municipal solid waste landfill.		
<b>RESOLVED COMPLAINTS:</b>		

On September 29, 2020, I, Michigan Department of Environment, Great Lakes, and Energy-Air Quality Division (EGLE-AQD) staff Robert Joseph, observed a landfill gas engine stack test and conducted a scheduled inspection of Eagle Valley Recycle and Disposal Facility (SRN: N3845) located at 600 West Silver Road, Orion Township, Michigan 48359. 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, Michigan Department of Environment, Great Lakes, and Energy-Air Quality Division (EGLE-AQD) Administrative Rules, and conditions of the facility's Renewable Operating Permit (ROP) MI-ROP-N3845-2015.

**Opening Introduction**

I arrived at the facility shortly after 9 a.m and met with David Croft, Maintenance Lead Worker, and Richard Kunze, landfill gas engine supervisor. I introduced myself and presented my identification and credentials and stated the purpose of my visit. Eagle Valley Recycle is a subsidiary of Waste Management Renewable Energy (WMRE) of Michigan, Inc. The hours of operation of the facility is 6am-5pm daily. The facility began operations in 1986.

The facility is a Type II Sanitary Landfill which is a discrete area of land that receives household waste. It also receives other types of non-hazardous wastes such as commercial solid waste, nonhazardous sludge, conditionally exempt small quantity generator waste, construction and demolition debris and industrial nonhazardous solid waste. Eagle Valley is subject to the National Standards of Performance for Municipal Solid Waste Landfills, 40 CFR Part 60 Subpart WWW, and the National Emission Standards for Hazardous Air Pollutants for Municipal Solid Waste Landfills, 40 CFR Part 63 Subpart AAAA. The facility also became subject to the National Standards of Performance for Municipal Solid Waste Landfills, 40 CFR Part 60 Subpart XXX due an expansion of the landfill in late 2019. This is currently being addressed in the facility's ROP renewal.

The facility has two enclosed flares for combustion of the landfill gas (4,000 ft<sup>3</sup>/min and 1,000 ft<sup>3</sup>/min), and two spark ignition, lean burn, reciprocating internal combustion engines (Caterpillar G3520C, 2,233 bhp at 100% load) for combusting treated landfill gas to produce electricity (1.6 MW gross electrical output). The engines drive an associated generator set to produce electricity. The facility is a major source of Hazardous Air Pollutants (HAPs). The facility's engines are subject to the National Emission Standards for Hazardous Air Pollutant (NESHAP) for Stationary Reciprocating Internal Combustion Engines, 40 CFR Part 63 Subpart ZZZZ, and the National Standards of Performance for Stationary Spark Ignition Internal Combustion Engines, 40 CFR Part 60 Subpart JJJJ.

**Facility Tour**

The landfill gas (LFG) is collected through an active landfill gas collection system, which consists of wells, headers, and gas mover equipment. Risers are also installed to tie-in the gas wells. The collected LFG can be sent to one of the two facility flares for combustion, sent to the facility's gas-to-energy engine plant (which is utilized by DTE energy), or sold off-site to the GM Orion Assembly Plant for combustion in their boilers/engines.

The site currently has fourteen active landfill cells with approximately 192 gas wells in operation. There are 14 active landfill cells which comprise 129.2 acres. In addition, there are three cells that are unconstructed which will add 18.6 acres. The total landfill area, active and unconstructed is 147.8 acres. Six acres are used for conservation easement and 32.4 acres are currently under final cover. All cells that are covered have 2-synthetic liners except for cell 1.

The facility has permit conditions for the following emission units: EU-LANDFILL, EU-ALGCS, EU-ABESTOS,

## EU-EMERGENCYGENEX.

The following flexible groups have permit conditions: FG-TREATMENTSYS, FG-ENCLOSEDFLARES, FG-ICENGINES, FG-RICEMACT and FG-COLDCLEANERS.

**Environmental Compliance per MI-ROP-N3845-2015:** Records since the department's last inspection in 2018 were submitted via email and reviewed onsite.

## **EU-LANDFILL**

### I. EMISSION LIMITS

<b>Pollutant</b>	<b>Limit</b>	<b>Time Period/ Operating Scenario</b>
<b>1. Methane (CH<sub>4</sub>) concentration</b>	<b>500 ppm above background level</b>	<b>Calendar quarter</b>

There were no locations that exceeded 500 ppm during the facility's 1st quarter methane surface scan in 2019. There was one location that exceeded 500 ppm during the 2nd quarter surface scan. It was successfully remediated with additional soil cover. There was no expansion of wells this reporting period. There were no locations that initially exceeded 500 ppm during the 3rd quarter scan. There was six locations that exceeded 500 ppm during the 4th quarter. The facility increased vacuum to nearby wells or installed PVC skirts to well casings to correct the exceedances.

### IV. DESIGN/EQUIPMENT PARAMETERS

The facility maintains two flares, #3 and #4, and they are designed in accordance to 40 CFR part 60. The facility's treatment system is outlined in the preventative maintenance plan listing the operating parameters and maintenance schedule.

### VI. MONITORING/RECORDKEEPING

The facility observes the cover integrity of the gas well collection system on a monthly basis and intermittently each week. The facility provided records for 2019 and 2020 which indicates the inspections conducted, and maintains on-site records of the design capacity for the current amount of solid waste in place and the year-by-year waste acceptance rate.

The facility accepted 2,177 tons daily in 2019 and 1,892 tons daily thus far in 2020. The total waste collected in 2019 was 566,013 tons and 224,562 tons thus far in 2020. The facility has not converted design capacity from volume to mass or mass to volume and does not add any liquids other than leachate in a controlled fashion to the waste mass.

## **EUALGS**

### III. PROCESS/OPERATIONAL RESTRICTIONS

In the event the collection or control system is inoperable, the gas mover system shuts down and all valves in the gas collection and control system contributing to venting of the gas to the atmosphere is closed within 1 hour per the Startup, Shutdown, and Malfunction plan. There have not been any such events that were not consistent with the plan.

The facility operates the gas collection system for all waste that has been in-place for five years. There are approximately 192 gas wells currently in-operation, and there have not been any documented events of a fire or positive pressure occurring within the collection system. The facility uses a two synthetic liner cover for its gas collection system.

The facility is required to operate each gas well in the gas collection system with a landfill gas temperature less than 55°C (131°F), oxygen concentration less than 5%, and under negative pressure. The facility operates the installed gas collection system by monitoring temperature, oxygen, and pressure for each well head. The facility

properly documents instances in which wells have temperature, oxygen, and/or pressure exceedances. In the instances in which an exceedance could not be corrected within 15 days, the facility has requested a higher operating variance, alternative timelines, and/or to decommission wells.

#### IV. DESIGN/EQUIPMENT PARAMETERS

The facility monitors the well collection field, and if necessary, makes adjustments to handle the gas flow rate by either adjusting the parameters of a specific well or installing additional wells or risers. Collected landfill gas is sent either to the facility's flares for combustion, sent to the facility's gas-to-energy engine plant (which is utilized by DTE energy), or sold off-site to the GM Orion Assembly Plant for combustion in their boilers/engines.

The facility has installed a series of horizontal, vertical, and horizontal wells capable of controlling and extracting the landfill gas, and each gas well is equipped with a sample port and thermometer to measure the subsurface temperature. The facility submits their gas collection control system designs plans to the EGLE-MMD for approval which is also reviewed by the EGLE-AQD also.

#### VI. MONITORING/RECORDKEEPING

The facility measures gauge pressure in the gas collection header at each individual well monthly. There were 26 wells which exceeded temperature, pressure, or oxygen limitations. Two wells exhibited temperature, pressure, oxygen exceedance which could not be resolved within 15 days during this reporting period during the first half of 2019. There were 32 wells which exhibited pressure or oxygen exceedances during the second half of 2019. Four wells exhibited a temperature, pressure, oxygen exceedance which could not be resolved within 15 days during this reporting period. The facility submitted either a higher operating value or decommission request for these wells to the AQD for approval.

The facility maintains on file the manufacture control equipment information and is collecting landfill gas at approximately 400-3500 sft<sup>3</sup>. There was no time period when the entire system was not in operation in

excess of five days. There were 19 wells installed during the second half of 2019, along with the associated header and lateral conveyance piping, air and force mains, and liquid extraction pumps.

The facility maintains a diagram of all vertical wells, horizontal wells and other gas extraction devices such as risers, including the locations of the areas excluded from collection and the proposed sites for the future collection system expansion. The facility bases the density of wells on waste acceptance rates and expected gas generation.

The facility maintains wells outside the limits of waste to measure if any methane is being detected off-site. Dates of the landfill gas well installations are maintained within the facility's database, and the age of the waste in which the landfill gas wells were installed is also documented. Existing cell (1) is the largest permitted site at 25.7 acres and has been in place since the facility began operations in 1986. Existing cell (7) is smallest permitted site at 5.0 acres and has been in-place since 1997.

#### ***EUABESTOS***

The facility does not accept friable asbestos waste. This was included in the ROP to address any permit conditions should the facility decide to accept this.

#### ***EUEMERGENCYGENEX***

The facility has a natural gas stationary emergency generator on site, however, the facility indicated the generator has not been used by the facility. I witnessed the generator to be locked out with the battery removed. The generator also appeared to be dilapidated and out service for years.

#### ***FGTREATMENTSYS***

This emission unit treats landfill gas before it is sold for use to DTE or sent to the GM Orion Assembly Plant. The treatment system removes particulate to at least the 10 microns and compresses the gas. In addition, enough moisture is removed to ensure good combustion of gas to the destruction of the NMOC will be maintained.

#### III. PROCESS/OPERATIONAL RESTRICTION(S)

There are no documented events of the treatment system experiencing emission issues. The facility maintains an alarm system which shuts down in the event the gas stream temperature downstream of the post-compression air-to-air cooler exceeds 120 degrees F. The facility operates the gas collection system so that the methane concentration is less than 500 parts per million above background at the surface of the landfill. In addition, in the event the collection or control system is inoperable, the gas mover system is shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere is closed within 1 hour.

#### IV. DESIGN/EQUIPMENT PARAMETER(S)

As stated, the facility is equipped with a continuous gas stream temperature monitoring device and an alarm system, and the blower is designed to shut down should the downstream of the post-compression air-to-air cooler exceed 120 degrees F. Records indicate routine maintenance was performed. Pressure gauges are installed for the treatment system as the facility records the pressure and volumes of the gas sent to GM Orion and off the grid to DTE.

#### VI. MONITORING/RECORDKEEPING

Per facility records and the semi-annual reports, there have not been any control or treatment exceedances or records which indicate that an alarm event occurred regarding the gas stream temperature. The facility maintains records of all maintenance activities per the preventative maintenance plan (PMP).

### ***FGENCLOSEDFLARES***

#### I. EMISSION LIMITS

<b>Pollutant</b>	<b>Limit</b>	<b>Time Period/ Operating Scenario</b>	<b>Equipment</b>
<b>1. NMOC</b>	<b>NMOC by 98 weight-percent or reduce the outlet NMOC concentration to less than 20 ppm by volume, dry basis as hexane at 3 percent oxygen</b>	<b>Daily</b>	<b>Enclosed Flare</b>

Both Flare #3 (4,000 ft<sup>3</sup>/min) and Flare #4 (1,000 ft<sup>3</sup>/min) were last tested in 2016.

Flare #3 measured to have a combustion chamber temperature of 1,596 F with a minimum required temperature of 1,546 F to meet the NMOC emission limit. Flare #4 measured to have a combustion chamber temperature of 1,600 F with a minimum required temperature of 1,550 F to meet the NMOC emission limit. Both flares measured less than 20 ppm by volume (dry hexane C<sub>6</sub> at 3% O<sub>2</sub>) at 0.27 ppm and 0.41 ppm for flares #3 and #4, respectively.

#### III. PROCESS/OPERATIONAL RESTRICTION(S)

The facility operates the enclosed flare at all times when the collected gas is routed to the enclosed flare. There were no instances when the flares were down for more than one hour during the first half of 2019, and there were two instances during the second half of 2019 when the flare temperature was not recorded greater than 15 minutes due to a power outage.

The facility does not have a bypass of the control system, therefore, there have not been any instances where landfill gas was discharged directly to ambient air. The enclosed flares are operated per 40 CFR 60.752(b)(2)(iii) (B), "A control system designed and operated to reduce NMOC by 98 weight-percent, or, when an enclosed combustion device is used for control, to either reduce NMOC by 98 weight percent or reduce the outlet NMOC concentration to less than 20 parts per million by volume, dry basis as hexane at 3 percent oxygen. The reduction efficiency or parts per million by volume shall be established by an initial performance test."

## VI. MONITORING/RECORDKEEPING

The facility calibrates, maintains, and operates the enclosed flares according to the manufacturer's specifications, including a temperature monitoring device equipped with a continuous recorder and having a minimum accuracy of plus or minus 1 percent of the temperature being measured expressed in degrees. A propane tank is available to light the flares if necessary which operates between 20%-80% of its total volume.

There have not been any 3-hour periods when either flare operated at an average combustion chamber temperature of more than 50 F below that established temperature during the most recent performance test. The facility employs a system called GoldenWatch which monitors the flares.

Three thermocouples measure the presence of a flame on each flare and the GoldenWatch system (variable frequency drive) monitors and regulates gas flow to the compressor. The compressor controls the valves to direct flow to the flares. There have not been any malfunctions of the flares.

The facility measures the average combustion temperature. When the landfill gas is not being routed to the facility's engines or the GM Orion plant, flows greater than 400 ft<sup>3</sup>/min are routed to Flare #3 and flows less than that are directed towards Flare #4. Both flares are currently meeting NMOC efficiencies. There have not been any control system exceedances documented by the facility.

### **FGICENGINES**

#### I. EMISSION LIMITS

<b>Pollutant</b>	<b>Limit</b>	<b>Time Period/ Operating Scenario</b>	<b>Equipment</b>
<b>1. CO</b>	<b>4.13 g/bhp-hr<sup>2</sup></b>	<b>Test Method</b>	<b>Each Engine in FGICENGINES</b>
<b>2. NOx</b>	<b>0.9 g/bhp-hr<sup>2</sup></b>	<b>Test Method</b>	<b>Each Engine in FGICENGINES</b>
<b>3. VOC</b>	<b>1.0 g/bhp-hr<sup>2</sup></b>	<b>Test Method</b>	<b>Each Engine in FGICENGINES</b>

The following were measured during the facility's most recent stack test on 09/26/19.

#### Engine 1:

- Generator Output 1,613 kW
- Engine horsepower 2,251 bhp
- Fuel Use 558 scfm
- LFG CH<sub>4</sub> Content 51.5%
- LFG Btu Content 469 Btu/scf
- Moisture 12.4%,
- CO emission rate 2.07 g/bhp-hr, NO<sub>x</sub> emission rate 0.45 g/bhp-hr, VOC emission rate 0.08 g/bhp-hr.

#### Engine 2:

- Generator Output 1,635 kW
- Engine horsepower 2,281 bhp
- Fuel Use 555 scfm
- LFG CH<sub>4</sub> Content 51.4%
- LFG Btu Content 468 Btu/scf
- Moisture 12.3%
- CO emission rate 2.52 g/bhp-hr, NO<sub>x</sub> emission rate 0.60 g/bhp-hr, VOC emission rate 0.08 g/bhp-hr.

All within the permit limit.

#### III. PROCESS/OPERATIONAL RESTRICTION(S)

The facility only burns landfill gas within the two reciprocating internal combustion engines. The facility provided an updated malfunction abatement/preventative maintenance plan with their ROP renewal this year. The plan on file includes the following; identification of the equipment and the supervisory personnel responsible for overseeing it, the description of the items and the frequency of the inspection and repairs, the identification of the equipment and operating parameters that are monitored to detect a malfunction or failure, the identification of the major replacement parts that are maintained in inventory for quick replacement and a description of the corrective procedures or operational changes that are taken in the event of a malfunction or failure to achieve compliance with the applicable emission limits.

The facility monitors and adjusts the engine's air/fuel ratio as needed to ensure that the engines operate at their maximum design output. Each engine is equipped with an automatic air-to-fuel ratio controller for NO<sub>x</sub> and CO emission control.

#### IV. DESIGN/EQUIPMENT PARAMETER(S)

The engines air/fuel ratio controller is installed, maintained and operated in a satisfactory manner. The air/fuel ratio controller is inspected daily by the facility, and each engine has a digital metering display to monitor and record the monthly hours of operation.

#### VI. MONITORING/RECORDKEEPING

The facility observes, in a satisfactory manner, the hours of operation for each engine via a digital monitoring device located within the gas-to-energy building. Both engines operated a combined 16,380 hours in 2019 and 514 MMcf of landfill gas was burned. The heating value for engine #1 and #2 was 512.5 and 518.5 BTU/ft<sup>3</sup>, respectively. The facility logs of all maintenance activities conducted according to the malfunction abatement/preventative maintenance plan. Some activities include an oil and filter change and check valve clearance.

The facility records the hours of operation of each engine on a monthly basis and logs it within the facility maintenance book. These hours are tracked to follow the required maintenance. The facility observes the emission and operating information of the engines in the gas-to-energy building. The building houses a one system compartment which contains the Operator Interface Module touchscreen, a one tie breaker compartment which contains the digital meter display and lockout relay, and a two-engine/generator with an emergency stop pushbutton. Engine hours are recorded via the digital meter display and emission testing occurs every 8,760 hours for each engine.

The engines were manufactured by Caterpillar in 2010. The serial numbers for engines 1 and 2 are GZJ00471 and GXJ00470, respectively, and model number for both engines is G3520C. Each have 2,233 brake-horse power and are 20-cylinder engines. The initial start-up date for both engines is July 20, 2011.

Tests are required every 8,760 engine hours per Section V. Testing/Sampling. In addition, three separate test runs are conducted during each performance test. Each test run is conducted within 10 percent of 100 percent peak (or the highest achievable) load and last at least one hour per the National Standards of Performance for Stationary Spark Ignition Internal Combustion Engines, 40 CFR Part 60 Subpart JJJJ. The facility maintains operating data to record the hours of operation and the landfill gas usage.

Engines #1 and #2 had landfill gas flows of 538 ft<sup>3</sup>/min and 551 ft<sup>3</sup>/min, respectively at the time of inspection. The engine hours for Engine #1 and #2 read during the time of inspection were 59,730.70 hours and 59,623.80 hours, respectively. Maintenance activities per the PM/MAP plan include replacement of a piston head and oil changes.

### **FGRICEMACT**

#### III. PROCESS/OPERATIONAL RESTRICTION(S)

Each engine operates in a manner which reasonably minimizes HAP emissions. The facility observes the air-to-fuel ratio via digital controller. The engine load factor for engine #1 and #2 read 96% and 98%, respectively, during the time of inspection. The battery voltages read 24.0 and 24.5 for both engine #1 and engine #2, respectively, with an average air-to-fuel ratio of 9 at the time of inspection.

Each engine operates in a manner which minimizes time spent at idle during start-up and minimizes the start-up time to a period needed for appropriate and safe loading of each engine. After the engine oil has obtained a minimum operating temperature, the engines can be loaded to a desired load. The engine oil temperature at the time of inspection for Engine #1 and #2 was 201 F and 208 F, respectively. There was no indication or documentation which indicates idle time has exceeded 30 minutes.

#### IV. DESIGN/EQUIPMENT PARAMETER(S)

The engines are equipped and maintained with separate fuel meters to record the daily fuel usage and volumetric flow rate. The fuel flow to both engines was 253,969 million ft<sup>3</sup> with an average heating value of 512.5 BTU/sft<sup>3</sup> during the first half of 2019. The fuel flow to both engines was 252,914 million ft<sup>3</sup> with an average heating value of 518.5 BTU/sft<sup>3</sup> during the second half of 2019. The information is recorded by the facility through a digital metering display.

#### VI. MONITORING/RECORDKEEPING

The engines as noted in Section IV above are monitored and recorded in regards to the daily fuel usage with separate fuel meters to measure the volumetric flow rate.

#### **FGCOLDCLEANERS**

The facility does not use nor maintain any cold cleaners on-site. It was included in the permit in case the facility one day incorporates its usage into their operations.

#### **Conclusion**

Based on the AQD inspection and records review, it appears that Eagle Valley Recycle and Disposal Facility is in compliance with the requirements of 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, Michigan Department of Environment, Great Lakes, and Energy-Air Quality Division (EGLE-AQD) Administrative Rules, and conditions of the facility's Renewable Operating Permit (ROP) MI-ROP-N3845-2015.

NAME Robert Joseph

DATE 09/29/20

SUPERVISOR Sebastianykallemka