

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

N329473610

FACILITY: Ottawa County Farms Landfill		SRN / ID: N3294
LOCATION: 15550 68th Avenue, COOPERSVILLE		DISTRICT: Grand Rapids
CITY: COOPERSVILLE		COUNTY: OTTAWA
CONTACT: Justin Obermeyer , Environmental Manager		ACTIVITY DATE: 08/21/2024
STAFF: Chris Robinson	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: FY '24 inspection to determine compliance status with respect to MI-ROP-N3294-2024 and any other applicable air quality rules and regulations.		
RESOLVED COMPLAINTS:		

Staff Chris Robinson (CR) from Michigan's Department of Environment, Great Lakes, and Energy (EGLE) Air Quality Division (AQD) initiated an onsite inspection of stationary source N3294 on August 21, 2024. This stationary source consists of Republic Service's Ottawa County Farms Landfill (OCFL) located at 15550 68th Avenue and Energy Developments of Coopersville's (EDC) Landfill Gas to Energy (LFGE) Plant located at 15352 68th Avenue. Following testing of OCFL's enclosed flare on August 21, 2024, CR completed a full onsite inspection of EDC's plant but was unable to complete the onsite inspection of the landfill due to available staffing. Therefore, the onsite inspection of the landfill was completed on September 16, 2024.

Prior to entry on both days, CR surveyed the perimeter of the stationary source for odors and visible emissions. There was a waste odor observed onsite near the entrance along 68th street on August 21st and on September 16th landfill gas odors were observed on the landfill where active drilling was taking place. Weather conditions on August 21, 2024, were approximately 66°F, mostly cloudy with calm winds and the weather conditions on September 16, 2024, were approximately 65°F, partly cloudy with east southeast winds at approximately 6 mph (www.weatherunderground.com).

On August 21, 2024, CR met with EDC's plant operator Dan Young and on September 16, 2024, CR met with Justin Obermeyer, OCFL's Environmental Manager. The purpose of the inspections was relayed, which was to determine both facility's compliance status with respect to applicable state and federal air quality rules and regulations including Renewable Operating Permit (ROP) No. MI-ROP-N3294-2024. Identification was also provided.

A) Facility Description

The OCFL is a municipal solid waste landfill, with a current design capacity of 56,975,000 cubic yards (43,561,000 cubic meters). Since the stationary source was modified after July 17, 2014, and has a design capacity greater than 2.5 million cubic meters, it is subject to the New Source Performance Standard (NSPS) for Municipal Solid Waste Landfills promulgated in 40 CFR Part 60, Subparts A and XXX. The stationary source is also subject to the National Emission Standard for Hazardous Air Pollutants (NESHAP) for Municipal Solid Waste Landfills promulgated in 40 CFR Part 63, Subparts A and AAAA. The site opted-in to the Subpart AAAA requirements that became effective on September 28, 2021.

Because OCFL's NMOC emissions are greater than 34 megagrams per year a landfill gas collection and control system (GCCS) is required to be installed and operated. Currently, gas from closed and active portions of the landfill are collected by an active gas collection system and either directed to EDC where six (6) internal combustion engines burn the landfill gas to produce electricity or combusted in an open flare operated by OCFL. Excess gas from EDC's treatment system is either burned in an open flare operated by EDC or used by Resource Recovery Corporation (RRC) for fuel to recover metal and sand from used foundry sand. The OCFL and EDC are considered to be one stationary source, therefore both are covered under ROP No. MI-ROP-N3294-2024. RRC is not considered part of the stationary source.

B) Compliance Evaluation

1) ROP-MI-N3294 Section 1 – Ottawa County Landfill

OCFL accepts both friable and nonfriable waste asbestos containing waste which is placed in designated locations within the landfill. Aerial photos and topographic maps are used to record these locations. Both natural barriers, fencing, and signage are used to deter access by the general public. The asbestos waste is placed in columns to eliminate the need to disturb those areas in the future. AQD staff observed the asbestos disposal area while on site on September 16, 2024; there was daily cover, and no issues were noted. Asbestos shipment records are being maintained; examples are attached. From August 2023 to July 2024 the company accepted 6,760 cubic yards of asbestos waste.

In 2008 a 3,700 scfm enclosed flare was installed to ensure that the landfill maintains compliance with the control requirements of the NSPS should EDC shutdown. The flare is used mainly as backup to the gas-to-energy plant. Each

time the enclosed flare is fired-up, a startup report is created. In November 2021, air use permit to install No. 116-20 was issued to address sulfur dioxide emissions as a result of the sulfur concentration in the landfill gas being higher than AP-42 which was used in the original evaluation of the flare.

The initial performance test for NMOC reduction efficiency was conducted in 2009 and CO emission rates are currently based on the June 16, 2022, performance test. Additional NMOC efficiency testing is required within 180 days of the ROP renewal issuance date and every five years afterwards. Performance testing for both NMOC and CO was last conducted on August 21, 2024, however, those results were not due by the time this report was prepared, nor had they been received.

The company is keeping all flare records in accordance with the permit, below is a summary of recordkeeping results. Records are attached.

Parameter	Value	Limit	Compliance
CO	0.004 lbs./MMBtu	0.20 lbs./MMBtu	Yes
CO	*0.37 tons	*65.7 tons	Yes
SO2	*0.05 tons	*35.9 tons	Yes
Landfill gas burned	*6.96 MMCF	*1,419 MMCF	Yes
Average BTU/CF	*3,675 MMBtus	NA	Yes
H2S content	<150 ppmv (75 – 113 ppm)	305 ppmv	Yes

* Based on 12-month Rolling time period. Value reported above is the highest monthly 12-month rolling value reported from August 2023 through July 2024.

The enclosed flare is equipped with a meter to monitor flow and temperature of the gas. A rental unit is being used while the facility's is off site for repairs. Calibrations are being done as required. The facility's meter was last calibrated on August 9, 2023, and the rental unit was last calibrated on August 1, 2024. Calibration records are attached. The enclosed flare had operated prior to this inspection for testing which CR observed. No issues, opacity, or odors were observed. There were no 3-hour periods of operation when the enclosed flare operated with a combustion temperature more than 82 degrees Fahrenheit below the average combustion temperature of 1,546°F established during the most recent performance test conducted on June 16, 2022.

As stated, the landfill has an active GCCS on both closed and interim cover areas that was installed as required under Subpart WWW requirements. The company is now meeting the GCCS installation and operation schedule under Subpart XXX and Subpart AAAA.

Each interior wellhead is to be operated with a landfill gas temperature less than 145°F and negative pressure. If a well exceeds one of these operating parameters, action is to be initiated to correct the exceedance within 5 calendar days. If the exceedance is not corrected within 15 calendar days of the first measured exceedance, then the gas collection system is to be expanded within 120 days of the initial exceedance to correct the problem or alternate compliance timeline requested. Under Subparts XXX and AAAA any well where a temperature or pressure exceedance is not corrected within 60 days will need to have a root cause analysis conducted. OCFL conducts well monitoring/tuning and well maintenance on a monthly basis as required by the ROP, Subpart XXX, and Subpart AAAA.

According to monitoring/tuning records from September 2023 through August 2024 wells OCF00027, OCF0044A, OCF0049A, OCF0057A, OCF0COSS, OCF0EW34, OCF0TD01, OCF0W25R, OCFDLC06, OCFEW131, OCFEW144, OCFEW145, OCFEW152, OCFEW23A, OCFEW29A, OCFEW41B, OCFEW64A, OCFPW26R, OCFW22AR, and OCF00H12 had positive pressure exceedances that were addressed within 5 days. With the exception of well OCF00027 all were corrected within 15 days. A root cause analysis was conducted for well OCF00027 and pressure was correct in 23 days. No wells had temperatures greater than 145°F. Monthly well monitoring records are attached.

The surface concentration of methane is monitored on a quarterly basis in accordance with the ROP, Subpart XXX, and Subpart AAAA. According to company records, monitor device calibrations were conducted as required prior to each surface monitoring event. All methane concentration exceedances were corrected within 30 days of the initial exceedance. A summary of the records is provided below, and the records are attached.

Quarter	Date	# locations above 500 ppm: minimum/maximum readings	10-day re-monitoring	2 nd 10-day re-monitoring	30-day re-monitoring
Q3 2023	Aug 30 & 31, 2023	5 locations: 598.8/1,755.4	0 locations: 0.0/12.1	--	0 locations: 0.0/22.8

Q4 2023	Nov 9 & 10, 2023	2 locations: 872.7/3,164.2	0 locations: 0.0/29.3	--	0 locations: 1.1/17.7
Q1 2024	March 7 & 8, 2024	13 locations: 520.2/12,679.3	2 locations: 534.0/715.8	0 locations: 1.5/6.6	0 locations: 0.0/25.0
Q2 2024	June 3 & 4, 2024	3 locations: 719.0/855.0	0 locations: 0.0/2.0	--	0 locations: 3.0/6.0

Records pertaining to maximum design capacity, year-to-year acceptance rate, and amount of waste in place are maintained and available within four hours in accordance with the ROP. As of January 5, 2024, there was 26,229,000 cubic yards of waste in place leaving 30,746,000 cubic yards remaining of the total permitted capacity of 56,975,000 cubic yards.

The facility utilizes one (1) cold cleaner which was observed. The lid was closed, and it is being maintained. No non-compliance issues were identified.

2) ROP-MI-N3294 Section 2 - Energy Developments Coopersville LLC

Currently gas from closed and active portions of OCFL are collected by an active gas collection system and directed to EDC where internal combustion engines burn the landfill gas to produce electricity. Excess gas is burned in an open flare operated by EDC or used in process equipment at RRC to recover metal and sand from used foundry sand.

Accompanying AQD staff on the inspection of EDC was Dan Young, Operator. EDC is subject to NSPS, Subpart XXX and NESHAP, Subpart AAAA requirements due to treating landfill gas. The engines at the site are subject to NSPS, Subpart JJJJ and NESHAP, Subpart ZZZZ requirements.

EDC also operates an open flare which is used when there is extra gas that the engines cannot process, or in the event of a catastrophic failure of the engines and bypass is needed. Since the flare is installed after the treatment system, the flare is not subject to the testing and control requirements. Gas going to the flare is sent through the treatment system in Plant 2. At the time of the inspection, the flare was not operating. The company has a separate monitor on the gas flow rate to the flare and thermocouple to measure temperature when it is used but does not monitor the presence of a pilot flame. A pilot flame is not lit continuously in the flare. Monitored parameters are recorded to a data recorder. This flare is subject to a CO emission limit of 0.37 lb./MMBTU and the net heating value of the landfill gas is limited to greater than or equal to 200 BTU/scf (7.45 MJ/m³). This flare was tested on June 17, 2024, which determined that the Net heating value was 19.89 MJ/m³. Compliance with the Material limit demonstrates compliance with the CO emission limit. Gas flow to the flare and operating hours are being recorded, records are attached.

Under Subpart XXX, landfill gas may be controlled by routing the collected gas to a treatment system that processes the collected gas for subsequent sale or use. The USEPA considers de-watering, filtering through at least a 10-micron screen, and compression prior to the combustion of the gas in energy recovery devices such as boilers, process heaters, turbines, or internal combustion engines to satisfy the definition of treatment.

Each plant at EDC contains a landfill gas treatment system. The Plant 1 (EUTREATSYS1) treatment system consists of a 36-inch diameter condensate/liquids knockout tank for de-watering, a 42-inch diameter carbon steel scrubber tank with scrubber pad for de-watering, two AC compressors, two radiator style aftercoolers which cool the gas, a coalescing filter with 0.3-micron coalescing filters, and a fuel gas dryer for gas de-watering and temperature control. The Plant 2 (EUTREATSYS2) treatment system contains a 24-inch diameter condensate/liquids knockout tank for de-watering, a 42-inch diameter carbon steel scrubber tank with scrubber pad for de-watering, one AC compressor, one radiator style aftercoolers which cool the gas, a 0.3-micron coalescing filter, and a fuel gas dryer for gas de-watering and temperature control.

Preventative maintenance is conducted on the treatment systems in accordance with the company's maintenance plan which also includes monitoring parameters and frequencies required by Subpart XXX. On a daily basis the company is recording the differential pressure on the landfill gas scrubber and coalescing filters, as well as other parameters. Coalescing filters are changed once the pressure drop reaches 2.5 Inches of water across the filters. The Plant 1, differential pressure drop on the filter was 0.2 inches of water and Plant 2 was 0.2 inches of water.

The presence of a treatment system excludes the engines from the testing and control requirements contained in the NSPS, Subpart XXX. However, any atmospheric vent from the gas treatment system is subject to the requirements.

Plant 1 consists of five (5) Caterpillar G3516LE internal combustion engines that were originally installed in 1992 and which were permitted in November 2021 under PTI No. 118-20.

Plant 2 consists of one (1) Caterpillar G3520C internal combustion engine (EURICEENGINE7) which was initially installed in 2006. The following table is a summary of each engine at the plant.

Engine Slot	Type	Serial #	Rating	Installed under PTI/Rule	NSPS JJJJ	MACT ZZZZ	Date of Last Major Overhaul
Engine 1	Caterpillar G3516LE	4EK00134	800 Kw (1148 hp)	PTI 118-20	N	Y	-
Engine 3		4EK00467					5/15/2022
Engine 4		4EK00136					-
Engine 5		4EK00124					3/12/2021
Engine 6		3RC00889					5/11/2022
Engine 7		GZJ00681					-
	Caterpillar G3520C		1600 kW (2233 hp)	173-05 (subsequently revised as 173-05A)	Y	Y	4-19-2022
							6/15/2022
							-
							-
							2/15/2021

EDC monitors the gas flow rate from the main header as well as the gas flow rate into the engines on a continuous basis and the gas is analyzed at regular intervals to verify the quality of the gas.

Records are maintained on-site in accordance with the preventative maintenance plan. A daily record sheet is also used to record various engine and treatment system parameters including kilowatt output, fuel flow, landfill gas quality, coalescing filter pressure drop and others. It is noted that the company uses non-resettable hours meters to record engine hours. The facility has upgraded their daily records to an electronic data monitoring and capture system rather than manual recordkeeping form used in the past.

Routine maintenance is conducted on the engines in accordance with manufacturer and company specifications which include replacing engine spark plugs, oil, and lubrication. Maintenance is also conducted on an as needed basis. In addition, "top end" overhauls, which includes replacing/cleaning cylinder heads, turbochargers and valves, are conducted on each engine after approximately 10,000 hours of operation. This is typically completed on site. A record of engine maintenance is attached.

"Major" overhauls are conducted every 50,000 to 100,000 hours of operation. Major overhauls include all of the work of a top end overhaul plus disassembling all of the bearings, seals, gaskets, and components that wear and may even include replacing the crankshaft. When an engine is due for a major overhaul, it is swapped out with another overhauled engine. When the engine is swapped, it is removed from the facility and either replaced with an engine with a different serial number and manufacture date or the same unit is brought back after being rebuilt and will have the same serial number and manufacture date. Swapping engines in this manner is an industry standard for maintaining the engines.

EDC's PTI No. 118-20 was issued to address sulfur dioxide emissions as a result of the sulfur concentration in the landfill gas being higher than AP-42 which was used in the original evaluation of the engines. Monthly hydrogen sulfide sampling is conducted using Draeger tubes. The tubes have a maximum concentration of 200 ppm where the site limit for H₂S is 330ppm. Draeger Tube results indicate H₂S well below 200 ppm, see summary table below. After the operators take a sample reading, they submit a picture of the tube and complete a handwritten form. The company is also taking semi-annual total reduced sulfur samples in accordance with the permit, results are in the table below. Although the lab results show H₂S concentrations much higher than the Draeger tube results, H₂S concentrations are still under the limit of 330 ppm.

Month	Draeger Tube Data (ppmv)			Lab Analytical Data (PPMV)		
	Date Sampled	Plant 1	Plant 2	Date Sampled	Plant 1	Plant 2
Nov	Not Reviewed			11/8/23	120	220
Dec				--	--	--
Jan	1/19/2024	70	90	--	--	--
Feb	2/23/2024	100	80	--	--	--

March	3/15/2024	115	90	--	--	--
April	4/19/2024	70	80	4/25/2024	110	150
May	5/17/2024	80	100	--	--	--
June	6/21/2024	70	90	--	--	--
July	7/24/2024	70	90	--	--	--
Aug	8/19/2024	65	70	--	--	--

Emissions and other records are maintained for the engines in accordance with PTI No. 118-20. Below is a summary of records:

Equipment	Parameter	Emissions	Limit	Stack test Date	Compliant	Comments
EUENGINE1, EUENGINE3, EUENGINE4, EUENGINE5, EUENGINE6	CO	<5.22 pph	7.8 pph	5/10-5/12, 2022	Yes	Highest test result from EUENGINE4
	NOx	<2.87 pph	4.56 pph	5/10-5/12, 2022		Highest test result from EUENGINE5
	SO2	<0.33 pph	1.1 pph	5/10-5/12, 2022		
	VOC	<1.16pph	1.7 pph	5/10-5/12, 2022		Highest test result from EUENGINE6
	Formaldehyde	< 0.73 pph	0.76 pph	5/10-5/12, 2022		
EUENGINE7	CO	12.0 pph	16.3 pph	5/9/23	Yes	
		3.09 g/bhp-hr.	5.0 g/bhp-hr. or 610 ppmvd at 15% O2	5/7/24		Due Every 8760 hrs. of operation
	NOx	1.99 pph	4.94 pph	5/9/23		
		0.68 g/bhp-hr.	3.0 g/bhp-hr. or 150 ppmvd at 15% O2	5/7/24		Due Every 8760 hrs. of operation
	SO2	0.40 pph	1.91 pph	5/10-5/12, 2022		
	VOC	0.55 pph	3.2 pph (Includes Formaldehyde)	5/9/23		
		0.13 g/bhp-hr.	1.0 g/bhp-hr.* or 80 ppmvd at 15% O2* (Does not include Formaldehyde)	5/7/24		Due Every 8760 hrs. of operation
	Formaldehyde	1.56 pph	2.1 pph	5/10-5/12, 2022		
Source-wide	SO2	6.55 tons (June 2024)	45.8 tpy	NA	Yes	
	H2S (engine plant)	Max 115 ppm See table above)	330 ppm			
	CO	154.43 tons (June 2024)	*290 tpy			
	NOx	37.69 tons Jan 2024)	*130 tpy			
	Landfill gas usage	990.3 MMcf (Jan 2024)	*1,581.53 MMcf/year			

*Based on a 12-month rolling time period

All stack dimensions appear to meet the minimum height of 60 feet above ground and a maximum diameter of 12 inches.

Engine 7 is subject to the requirements of 40 CFR Part 60, Subpart JJJJ based on the engine installation and manufacture date. The company submitted an initial notification on June 6, 2012. The company performed an initial performance test

for Subpart JJJJ on April 14, 2011, which was within 180 days of the Engine 7 installation date of October 2010. EDC appears to be meeting other applicable requirements of Subpart JJJJ at this time.

In May 2012 it was determined that the potential to emit of formaldehyde from Engines 1 through 7 is 28.9 tons per year which is above the major source threshold of 10 tons for a single HAP. Because the engines are considered a major source of HAPs and were installed after December 12, 2002, they are subject to the requirements of 40 CFR Part 63, Subpart ZZZZ. The company submitted an initial notification on June 6, 2012. EDC appears to be meeting Subpart ZZZZ requirements at this time.

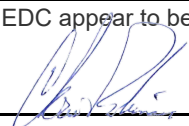
3) Annual Emissions Reporting

Emissions were submitted on March 7 and March 14. No issues were identified, and the submittal was accepted with no changes required.

C) Compliance Determination

OCFL and EDC appear to be in compliance with applicable air quality rules and regulations at this time.

NAME



DATE

9/18/2024

SUPERVISOR

