

Michigan Department of  
Environment, Great Lakes, and Energy  
Air Quality Division

State Registration Number  
N5984

**RENEWABLE OPERATING PERMIT  
STAFF REPORT**

ROP Number  
MI-ROP-N5984-2019

**Pine Tree Acres, Inc. and Sumpter Energy Associates, LLC**

State Registration Number (SRN): N5984

Located at

36600 29 Mile Road, Lenox Township, Macomb County, Michigan 48048

Permit Number: MI-ROP-N5984-2019

Staff Report Date: April 22, 2019

This Staff Report is published in accordance with Sections 5506 and 5511 of Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451). Specifically, Rule 214(1) of the administrative rules promulgated under Act 451, requires that the Michigan Department of Environment, Great Lakes, and Energy (EGLE), Air Quality Division (AQD), prepare a report that sets forth the factual basis for the terms and conditions of the Renewable Operating Permit (ROP).

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**RENEWABLE OPERATING PERMIT**

**APRIL 22, 2019 - STAFF REPORT**

**Purpose**

Major stationary sources of air pollutants, and some non-major sources, are required to obtain and operate in compliance with an ROP pursuant to Title V of the federal Clean Air Act; and Michigan's Administrative Rules for Air Pollution Control promulgated under Section 5506(1) of Act 451. Sources subject to the ROP program are defined by criteria in Rule 211(1). The ROP is intended to simplify and clarify a stationary source's applicable requirements and compliance with them by consolidating all state and federal air quality requirements into one document.

This Staff Report, as required by Rule 214(1), sets forth the applicable requirements and factual basis for the draft ROP terms and conditions including citations of the underlying applicable requirements, an explanation of any equivalent requirements included in the draft ROP pursuant to Rule 212(5), and any determination made pursuant to Rule 213(6)(a)(ii) regarding requirements that are not applicable to the stationary source.

**General Information**

Stationary Source Mailing Address:	Section 1: Pine Tree Acres, Inc. 36600 29 Mile Road Lenox Township, Michigan 48048  Section 2: Sumpter Energy Associates, LLC 36450 29 Mile Road Lenox Township, Michigan 48062
Source Registration Number (SRN):	N5984
North American Industry Classification System (NAICS) Code:	562212
Number of Stationary Source Sections:	2
Is Application for a Renewal or Initial Issuance?	Renewal
Application Number:	201700155
Responsible Official:	Section 1: David Rogers, District Manager 586-749-6005  Section 2: Dennis Plaster, Vice President of Operations Phone: 585-948-8580
AQD Contact:	Robert Joseph, Environmental Engineer 586-506-9564
Date Application Received:	December 12, 2017
Date Application Was Administratively Complete:	December 12, 2017
Is Application Shield in Effect?	Yes
Date Public Comment Begins:	April 22, 2019
Deadline for Public Comment:	May 22, 2019

## **Source Description**

Pine Tree Acres, Inc. (owned and operated by Waste Management, Inc.) is a municipal solid waste landfill located at 36600 29 Mile Road, Lenox Township, Macomb County, Michigan. Sumpter Energy Associates (operated by Aria Energy) is an electric generating facility that utilizes the landfill gas (LFG) from Pine Tree Acres, Inc. as fuel and is located at 36450 29 Mile Road, Lenox Township, Michigan. On February 11, 2008, an agreement was made between the Air Quality Division (AQD), and the management of Pine Tree Acres, Inc. and Sumpter Energy Associates, which allowed the two entities to have separate Renewable Operating Permits (ROPs). Now, due to a recent AQD policy change, all applicable requirements for both facilities are being combined into one ROP. Pursuant to the definition in Rule 119(r) (Michigan Administrative Code R 336.1119(r)), both of these entities comprise one single stationary source.

A landfill means an area of land or an excavation in which wastes are placed for permanent disposal. Pine Tree Acres, Inc. is located east of commercial businesses along State Route M-19, and there is a golf course located to the northeast of it. Pine Tree Acres is approximately 564.5 acres total, with roughly 203.2 acres consisting of surrounding wetlands and 361.3 acres for solid waste (108.9 acres unconstructed). Pine Tree Acres is a type II sanitary landfill, which accepts municipal solid waste (MSW), biosolids from wastewater treatment plants (sludge), and inert wastes such as construction debris, demolition debris, foundry sand, ash and low-level contaminated soils. The facility also accepts asbestos containing waste. The asbestos waste is documented through a shipping manifest when it arrives onsite and it is set in-place with other waste. The facility documents the locations of where the asbestos is placed within the landfill.

Waste materials arrive in a variety of vehicles that have the potential to generate fugitive dust emissions; this is controlled by frequent wetting and sweeping of the entrance roads. After waste is transported to the facility, it is placed in one of the active working areas, known as cells, and is covered daily with soil or other cover materials. When a cell reaches its design capacity, a liner is installed to cover the waste. Over time, the waste materials decompose producing LFG.

Natural biological processes occurring in landfills transform the waste's constituents (above listed wastes) producing leachate and landfill gas. Initially, decomposition is aerobic until the oxygen supply is exhausted. Anaerobic decomposition of buried refuse creates most of the landfill gas. The LFG is comprised of methane (CH<sub>4</sub>), carbon dioxide (CO<sub>2</sub>), carbon monoxide (CO), hydrogen sulfide (H<sub>2</sub>S), and volatile organic compounds (VOCs). LFG typically contains a small percentage of non-methane organic compounds (NMOCs), greenhouse gases, and volatile organic compounds (VOCs). NMOC is the primary regulated air pollutant associated with landfill gas generation.

The site has twelve (20) active landfill cells with approximately 265 active acres not at final grade. The landfill is projected to have approximately another 22 years of service. There are approximately 565 acres available for total development. In addition, 360 acres of that total is for waste development with 250 acres developed, and 110 acres undeveloped. 203 acres are used for conservation easement. All cells that are covered have 2-synthetic liners except for cell 1.

The collected LFG is also routed to two enclosed flares, two open flares, or the eight reciprocating internal combustion engines. Combustion of the LFG by the engines and the flares may emit the following air pollutants into the ambient air: NMOCs, nitrogen oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), fine and coarse particulate matter (PM), hydrogen chloride (HCl) and formaldehyde (CH<sub>2</sub>O).

Pine Tree Acres, Inc. operates the landfill gas collection system consisting of multiple LFG wells, the LFG header system, and the LFG treatment system. The landfill has a total of four utility flares: EU-FLARE4 and EU-FLARE6 are enclosed flares located near the main office building and combust treated landfill gas; EU-FLARE3 is a candle stick open flare located on the west side of the landfill; and EU-FLARE5 is a candle stick open flare and only operates if one or more of the other flares or engines is not in operation.

On February 28, 2011, Waste Management, Inc. installed EU-ICENGINES 1 through 8. These eight reciprocating internal combustion engines (Caterpillar Model G3520C, 2,233 bhp at 100% load) combust treated landfill gas (1.6 MW gross electrical output) by driving an associated generator set to produce electricity.

Permit to Install (PTI) #233-09 was issued on March 3, 2010, for EU-ICENGINES 1 through 8 and EU-FLARES 3 through 6. This permit set the hydrogen sulfide (H<sub>2</sub>S)/total sulfur (S) content concentration limit for both at 165 parts per million (ppm) with each to be sampled on a monthly basis.

The permit also allowed PTA to petition to reduce the frequency of gas sampling to quarterly if no exceedances occurred after one (1) year with AQD approval, or annually if no exceedances occurred after (2) years with AQD approval.

In 2014, PTA requested an increase in the hydrogen sulfide/total sulfur concentration for the EU-ICENGINES and EU-FLARES. This increase would therefore increase the sulfur dioxide (SO<sub>2</sub>) emissions from the source.

On February 13, 2015, PTI #160-14 was issued for EU-ICENGINES 1 through 8 and EU-FLARES 3 through 6. This permit set the hydrogen sulfide (H<sub>2</sub>S)/total sulfur (S) content concentration limit for both at 269 parts per million (ppm) with each to be sampled on a daily basis. The permit also allowed PTA to petition to reduce the frequency of gas sampling to weekly if no exceedances occurred after one (1) year with AQD approval. This new permit allowed for an increased concentration of the pollutant but increased the gas sampling frequency for both the EU-ICENGINES and EU-FLARES.

On February 29, 2016, PTA submitted a request to the AQD after one (1) year of no exceedances to reduce the gas sampling to weekly. On March 21, 2016, the AQD approved the request for gas sampling to occur on a weekly basis. The facility has performing weekly gas sampling on both EU-ICENGINES and EU-FLARES.

If at any time the concentration readings exceed 269 ppm, PTA shall resume sampling and recording on a daily basis and review all operating and maintenance activities for the landfill gas collection and treatment system along with keeping records of corrective actions taken. In addition, once the concentration determined from the daily readings are maintained below 269 ppm of hydrogen sulfide/total reduced sulfur concentration in the landfill gas for one year after an exceedance, PTA may resume weekly monitoring and recordkeeping. PTA is required to notify the AQD within one week of when the frequency of the gas sampling changes for any reason.

Pine Tree Acres treats the landfill gas with two technologies. The Thiopaq process is Pine Tree Acres' primary H<sub>2</sub>S treatment control and the SulfaTreat process serves as a secondary/backup control. The process consists of four (4) 70,000 tanks which use FeO (iron oxide) as a media. The gas is first scrubbed with a mild alkaline solution which then flows to a 25,000-gallon bioreactor tank. Bacteria is killed off at 105 °F. Elemental sulfur (S) is separated from the liquid phase as a concentrated sludge by centrifuge. Gas condensate collecting in the base of each tank is drained manually to a process liquid sump. The condensate ultimately discharges to the 40,000-gallon aboveground leachate storage tank.

The two blower stations (Knockout Pot Filters, Central Blower Station and Filter Vessel) incorporate filtration compression and dewatering. The operating and maintenance plan indicate complete combustion when the treated gas is delivered to the facility's engines or to Sumpter Energy. There are no atmospheric vents associated with PTA's treatment system. Moisture is removed via treatment and is managed by PTA's leachate system in accordance with Part 115, Act 451.

Sumpter Energy has a total of nine reciprocating internal combustion engines located in two buildings. The buildings are adjacent to Waste Management's two enclosed flares and landfill gas treatment system. Building 1 (named PTA Phase I) houses Engines 1 through 7 and Building 2 (named PTA Phase II) houses Engines 8 and 9. On June 20, 2016, the facility applied for a permit for Engine ten (10), EU-ICEENGINE10.

The permitted engine is manufactured by Caterpillar, Inc. (Model No. CAT G3516, 2,242 bhp at 100% load). Permit to Install (PTI) 105-16 was approved on October 25, 2016. This engine has permit limits for the same pollutants as Engines 8 and 9 with the addition of formaldehyde. This engine has not yet been installed and was given AQD approval for an extension through October 18, 2019. This permit is now being rolled into the ROP. If installed, it will be housed in the same building as engines 8 and 9.

Engines 1 through 7 are noted as EU-ENGINE1 through EU-ENGINE7 and comprise the Flexible Group FG-ENGINES. The engines are manufactured by Caterpillar, Inc. (Model No. CAT G3516 and are rated at 1,138 horsepower and 8.6 MMBtu/hr) with 16 cylinders each. These engines have permit limits for NO<sub>x</sub>, CO, HCl, and NMOC. Pine Tree Acres treats the landfill gas via the Thiopaq and SulfaTreat removal process before sending it to these engines.

Engines 8 and 9 are noted as EU-ICENGINE8 and EU-ICENGINE9 and comprise the Flexible Group FG-ICENGINE2. These 2 engines are reciprocating internal combustion engines manufactured by Caterpillar, Inc. (both with Model No. CAT G3520C and rated at 2233 brake-horsepower with 1.6 megawatts of gross electrical output) with 20 cylinders each. These engines have permit limits for NO<sub>x</sub>, CO, SO<sub>2</sub>, and VOC. These engines combust untreated landfill gas from Pine Tree Acres. This was known at the time the permit was applied for, but rather than undergo Prevention of Significant Deterioration (PSD) review, Sumpter Energy accepted permit limits for these two engines. Sumpter Energy submitted a sulfur monitoring and sulfur dioxide (SO<sub>2</sub>) emission curtailment plan to the AQD on January 4, 2013. The facility submitted a revised curtailment plan on November 13, 2014, based on 100% of the fuel sulfur being converted to SO<sub>2</sub> exhaust gas emissions. This plan was approved by the AQD.

In addition to the monthly Hydrogen Sulfide (H<sub>2</sub>S) testing requirement of the landfill gas in the facility's ROP for Flexible Group FG-ICENGINE2, weekly testing is required whenever a monthly Hydrogen Sulfide reading concentration of 500 ppm or greater is observed. Also, daily testing is required whenever a Hydrogen Sulfide reading concentration of 600 ppm or greater is observed. Daily testing is to continue until the Hydrogen Sulfide reading concentration falls below 600 ppm.

The following table lists stationary source emission information as reported to the Michigan Air Emissions Reporting System (MAERS) for the year **2017**.

**TOTAL STATIONARY SOURCE EMISSIONS**

<b>Pollutant</b>	<b>Tons per Year (Pine Tree Acres)</b>	<b>Tons per Year (Sumpter Energy)</b>	<b>Total Tons per Year</b>
Carbon Monoxide (CO)	418.5	259.6	678.1
Nitrogen Oxides (NO <sub>x</sub> )	78.1	66.8	144.9
Particulate Matter (PM)	55.1	7.7	62.8
Sulfur Dioxide (SO <sub>2</sub> )	31.4	47.3	78.7
Volatile Organic Compounds (VOCs)	19.0	20.3	39.3
Non-methane Organic Compounds (NMOC)	99.4	0	99.4

The following table lists the potential to emit of Hazardous Air Pollutant emissions as calculated by the facility for the year 2017:

<b>**Individual Hazardous Air Pollutants (HAPs)</b>	<b>Tons per Year (Pine Tree Acres)</b>	<b>Tons per Year (Sumpter Energy)</b>	<b>Total Tons per Year</b>
Various Compounds	140.3	53.0	193.3

\*\*As listed pursuant to Section 112(b) of the federal Clean Air Act.

See Parts C and D in the ROP for summary tables of all processes at the stationary source that are subject to process-specific emission limits or standards.

**Regulatory Analysis**

The following is a general description and history of the source. Any determinations of regulatory non-applicability for this source are explained below in the Non-Applicable Requirement part of the Staff Report and identified in Part E of the ROP.

The stationary source is in Macomb County, which is currently designated by the United States Environmental Protection Agency (USEPA) as non-attainment area with respect to the 8-hour ozone standard.

The stationary source is subject to Title 40 of the Code of Federal Regulations (CFR) Part 70, because the potential to emit CO, NO<sub>x</sub>, SO<sub>2</sub>, PM, and VOC exceeds 100 tons per year, and the potential to emit of any single HAP regulated by Section 112 of the federal Clean Air Act, is equal to or more than 10 tons per year and/or the potential to emit of all HAPs combined is equal to or more than 25 tons per year. Also, the source is subject to New Source Performance Standards (NSPS) for Municipal Solid Waste Landfills promulgated in 40 CFR Part 60, Subparts WWW and XXX that require an ROP.

EU-FLARE3 through EU- FLARE6 at Pine Tree Aces, EU-ICENGINE1 through EU-ICENGINE8 at Pine Tree Acres, and EU-ICENGINE8 and EU-ICENGINE9 at Sumpter Energy, were subject to review under the Prevention of Significant Deterioration (PSD) regulations of the Michigan Air Pollution Control Rules Part 18, Prevention of Significant Deterioration of Air Quality or 40 CFR Part 52.21 because at the time of New Source Review permitting the potential to emit of carbon monoxide (CO) was greater than 250 tons per year.

New Source Performance Standards (NSPS), Standards of Performance for Municipal Solid Waste Landfills codified as 40 CFR Part 60, Subpart WWW, are applicable to MSW landfills that commenced construction, reconstruction or modification after May 30, 1991. Subpart WWW requires subject facilities with a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters to submit an initial design capacity report and a NMOC emission rate report. Pine Tree Acres became subject to 40 CFR Part 60, Subpart WWW with their 2007 expansion.

Furthermore, subject facilities are required to submit a design plan and install an LFG collection and control system (if NMOC emissions are greater than or equal to 50 megagrams/year) that meet the provisions of 40 CFR 60.752 through 60.759. A gas collection and control system are required to be installed after the NMOC emissions rate report is submitted to the regulatory agency which shows that the MSW Landfill produces 50 megagrams or greater per year NMOC.

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. This is primarily because the landfill meets the criterion of 40 CFR 63.1935(3) due to the landfill having NMOC emissions greater than 34 Megagrams per year.

It is noted that the requirements under 40 CFR Part 60, Subpart WWW also apply to the stationary source because 40 CFR Part 63, Subpart AAAA adopts Subpart WWW requirements by reference.

A 2015 expansion of the landfill permitted seven (7) cells. A landfill modified after July 17, 2014 is therefore subject to the New Source Performance Standard (NSPS) for Municipal Solid Waste Landfills promulgated in 40 CFR Part 60, Subparts A and XXX. New Source Performance Standards (NSPS), Standards of Performance for Municipal Solid Waste Landfills codified as 40 CFR Part 60, Subpart XXX, is applicable to MSW landfills that commenced construction, reconstruction or modification after July 17, 2014. Therefore, the landfill is now subject to both 40 CFR Part 60, Subparts WWW and XXX regulations.

The stationary source is subject to the National Emission Standard for Hazardous Air Pollutants for Asbestos (NESHAP) promulgated in 40 CFR Part 61, Subparts A and M because the landfill accepts asbestos waste.

EU-ICENGINE1 through EU-ICENGINE8 at Pine Tree Acres are subject to the New Source Performance Standards for Stationary Spark Ignition Internal Combustion Engines promulgated in 40 CFR, Part 60, Subparts A and JJJJ. EU-ICENGINE8 through EU-ICENGINE10 at Sumpter Energy are subject to the New Source Performance Standards for Stationary Spark Ignition Internal Combustion Engines promulgated in 40 CFR Part 60, Subparts A and JJJJ.

The ROP for Pine Tree Acres contains conditions to address the applicability of the Maximum Achievable Control Technology Standards for Stationary Reciprocating Internal Combustion Engines promulgated in 40 CFR Part 63, Subparts A and ZZZZ. All engines at Sumpter Energy address the applicability of the Maximum Achievable Control Technology Standards for Stationary Reciprocating Internal Combustion Engines promulgated in 40 CFR Part 63, Subparts A and ZZZZ.

The monitoring conditions contained in the ROP are necessary to demonstrate compliance with all applicable requirements and are consistent with the "Procedure for Evaluating Periodic Monitoring Submittals."

No emission units have emission limitations or standards that are subject to the federal Compliance Assurance Monitoring rule pursuant to 40 CFR Part 64, because all emission units at the stationary source either do not have a control device or those with a control device do not have potential pre-control emissions over the major source thresholds.

Please refer to Parts B, C and D in the draft ROP for detailed regulatory citations for the stationary source. Part A contains regulatory citations for general conditions.

**Source-Wide Permit to Install (PTI)**

Rule 214a requires the issuance of a Source-Wide PTI within the ROP for conditions established pursuant to Rule 201. All terms and conditions that were initially established in a PTI are identified with a footnote designation in the integrated ROP/PTI document.

The following table lists all individual PTIs that were incorporated into previous ROPs. PTIs issued after the effective date of ROP No. MI-ROP-N5984-2013a and ROP No. MI-ROP-N8004-2013 are identified in Appendix 6 of the ROP.

PTI Number – Pine Tree Acres (PTA) / Sumpter Energy (SE)			
233-09 (PTA)	160-14 (PTA)	269-97A (SE)	103-09 (SE)



### **Non-applicable Requirements**

Part E of the ROP lists requirements that are not applicable to this source as determined by the AQD, if any were proposed in the ROP Application. These determinations are incorporated into the permit shield provision set forth in Part A (General Conditions 26 through 29) of the ROP pursuant to Rule 213(6)(a)(ii).

### **Processes in Application Not Identified in Draft ROP**

There were no processes listed in the ROP Application as exempt devices under Rule 212(4). Exempt devices are not subject to any process-specific emission limits or standards in any applicable requirement.

### **Draft ROP Terms/Conditions Not Agreed to by Applicant**

This draft ROP does not contain any terms and/or conditions that the AQD and the applicant did not agree upon pursuant to Rule 214(2).

### **Compliance Status**

The AQD finds that the stationary source is expected to be in compliance with all applicable requirements as of the effective date of this ROP.

### **Action taken by the MDEQ, AQD**

The AQD proposes to approve this ROP. A final decision on the ROP will not be made until the public and affected states have had an opportunity to comment on the AQD's proposed action and draft permit. In addition, the USEPA is allowed up to 45 days to review the draft ROP and related material. The AQD is not required to accept recommendations that are not based on applicable requirements. The delegated decision maker for the AQD is Ms. Joyce Zhu, Southeast Michigan District Supervisor. The final determination for ROP approval/disapproval will be based on the contents of the ROP Application, a judgment that the stationary source will be able to comply with applicable emission limits and other terms and conditions, and resolution of any objections by the USEPA.

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**JUNE 6, 2019 - STAFF REPORT ADDENDUM**

**Purpose**

A Staff Report dated January 14, 2019, was developed to set forth the applicable requirements and factual basis for the draft Renewable Operating Permit (ROP) terms and conditions as required by Rule 214(1) of the administrative rules promulgated under Act 451. The purpose of this Staff Report Addendum is to summarize any significant comments received on the draft ROP during the 30-day public comment period as described in Rule 214(3). In addition, this addendum describes any changes to the proposed ROP resulting from these pertinent comments.

**General Information**

Responsible Official:	Section 1: Pine Tree Acres, Inc. David Rogers, District Manager 586-749-6005  Section 2: Sumpter Energy Associates, LLC Dennis Plaster, Vice President of Operations Phone: 585-948-8580
AQD Contact:	Robert Joseph, Environmental Engineer 586-506-9564

**Summary of Pertinent Comments**

No pertinent comments were received during the 30-day public comment period.

**Changes to the April 22, 2019 Draft ROP**

No changes were made to the draft ROP.