

Lane Regional Air Protection Agency
Standard Air Contaminant Discharge Permit

REVIEW REPORT

GLE
92757 Hwy 99
Junction City, OR 97448

Permit No. 203147

1. General Background Information

GLE operates an electricity generating plant that will deliver power to the grid. The facility uses one (1) GE Jenbacher digester biogas-fired internal combustion engine generator to provide electrical power. The digester biogas is derived from one (1) air-tight anaerobic digester tank using "green feedstock" (e.g. grass straw and food processing residuals. For more information see ODEQ. 2000 Fact Sheet - Composting Facilities in Oregon). The facility estimates the biogas fuel to consist of approximately 60% methane and 40% CO₂. Heat and steam will be produced and used at an adjacent facility. The equipment is rated at 1059 kW at 60Hz, 1,800 RPM. The emission calculations assume a maximum heat input of 79,236 MMBtu/yr.

Additional emissions are from excess biogas flaring. Use of flare is a last resort when biogas cannot be utilized in the combustion engine. For planned downtime, like maintenance, feeding of the digester will be reduced. With decreased biogas production the storage capacity in the biogas holder is significantly increased to greater than 6 hr capacity. Same process will occur during longer downtimes. Normally digester feeding will support 4-6 hr capacity in the biogas holder. By these measures the amount of biogas combusted in the flare is minimized; excess biogas flaring episodes are expected to be minimal and only occur during emergencies (prevent methane released to atmosphere).

The facility will operate nearly continuously (8,520 hrs/yr).

2. Reasons for Permit Action

The facility proposes to operate a process listed in Title 37, Table 1, Part B (B.25 - Electrical Power Generation from combustion) and is therefore required to obtain air contaminant discharge permit (ACDP). The objective of this permit action is to issue the new permit to authorize construction and operation of the proposed facility.

3. Fee Basis

The facility is considered a Standard ACDP source because actual emissions and future projected emissions are greater than 10 tons/year for a criteria pollutant (CO and NO_x) and the facility is subject to a New Source Performance Standard (NSPS), in accordance with LRAPA Title 37, Table 1, Part C.4.

4. Compliance Summary

This is a new facility with no history of enforcement action.

5. Performance Test Results

No performance testing has been conducted at this facility. Because the facility's emission estimations for all pollutants are well below the Plant Site Emission Limits (PSELs), no testing to verify emission factors is required at this time.

However, because the manufacturer has not provided a certification of compliance with the applicable emission standards in NSPS Subpart JJJJ, the facility is required to perform compliance/performance testing. The facility is required to conduct an initial performance test within 1 year of engine startup to determine compliance with the NO_x, CO, and VOC emission standards for Spark Ignition Stationary Reciprocating Internal Combustion Engines (SI-RICE) required by the SI RICE New Source Performance Standards. The NSPS requires subsequent testing every 8,760 hours of operation or 3 years, whichever is earlier.

6. Plant Site Emission Limits

The PSELs are set in accordance with Section 42-0040 and 42-0041. The facility has the capacity less than the Significant Emission Rate for all pollutants and, hence, the PSELs for those pollutants are set at the Generic PSEL level. Maximum actual emissions are based on the estimated maximum firing of the biogas-fired generator. Emissions factors were evaluated for the waste biogas flare and were found to be less than the emission factors for the generator; hence the emission factors for generator overestimate emissions for the waste biogas flare. The facility estimates a maximum of 200 hours per year of excess biogas flaring.

The estimated maximum annual emissions are shown in the table below.

Pollutant	Engine Energy Input (MMBtu/yr)	Engine Emission Factor (lb/MMBtu)	Total Emissions for flare and engine (tons/yr)
PM/PM ₁₀ /PM _{2.5}	79,236	0.011	0.5
VOC*	79,236	0.115	4.6
SO ₂	79,236	0.092	3.7
NO _x	79,236	0.383	15.4
CO	79,236	0.870	34.9

*VOC as defined in 40 CFR 51.100(s). For the purposes of Subpart JJJJ, when calculating emissions of VOCs, emissions of formaldehyde should not be included.

The following annual PSELs are included in the permit (all values are in tons per year).

Annual (12-month rolling) PSEL
(tons/year)

Source	PM	PM ₁₀	PM _{2.5}	SO ₂	NO _x	VOC	CO
Totals	24	14	9	39	39	39	99

7. Additional Emission Limitations

LRAPA's process weight rule specifies limits on the emissions of particulate matter for specific processes as a function of the amount of material processed. [LRAPA 32-045(A)] Because PM emissions are minimal, the source is expected to be in compliance with the process weight rule.

The permit includes general limitations for visible emissions as well as particulate matter grain-loading.

8. Hazardous Air Pollutants (HAP)

The projected HAP emissions from the source are expected to be minimal. The engine is the only permitted source at the facility and, as such, the engine is not located at an area source of HAP emissions. Therefore the area source SI-RICE NESHAP (Subpart ZZZZ) does not apply to this facility. However, the facility is required to comply with the New Source Performance Standards for SI-RICE (Subpart JJJJ). See Item 11 below.

9. Typically Achievable Control Technology (TACT)

LRAPA Title 32-008 requires a new emission unit at a facility to meet TACT if the emissions unit is not subject to the emissions standards under LRAPA Title 32, Title 33, Title 39, or Title 46 for the pollutants emitted, and the facility is required to have a permit. The engine-generator is subject to an NSPS standard in Title 46 and is therefore not required to meet TACT.

10. New Source Review (NSR) and Prevention of Significant Deterioration (PSD)

Because the proposed PSELS for all regulated pollutants are below the Significant Emission Rates (SERs) in LRAPA Title 38, the facility is neither subject to NSR requirements for PM10 nor the PSD requirements for SO_x, NO_x, CO, and VOC. The facility will be located in attainment area for all regulated pollutants.

11. New Source Performance Standards (NSPS)

The facility is subject to the NSPS for Stationary Spark Ignition (SI) Landfill/Digester Gas Internal Combustion Engines (RICE NSPS – Subpart JJJJ) and is required to meet those applicable requirements. See also Item 8 above.

12. Continuous Compliance

To ensure compliance with the annual PSEs, the permittee is required to perform monthly emissions calculations and keep a 12-month rolling record of the following information for a period of two (2) years from date of entry, unless otherwise specified.

Monitoring or Recordkeeping Parameter	Minimum Recording Frequency
Biogas burned in the engine generator (MMBtu)	Monthly
Biogas burned by the excess biogas flare (MMBtu)	Monthly
Hours of Operation for the engine generator (hrs)	Monthly
Information from equipment manufacturer(s) regarding engine emissions and the efficiency of any pollution control equipment.	These records must be retained on-site for as long as the generator is used for power production.
Description of any major maintenance to the generator as required by Condition 8.b.	Upon occurrence
Any odor complaints received by the permittee	Upon occurrence
Results of biogas fuel analysis for heat content and/or composition	Upon occurrence

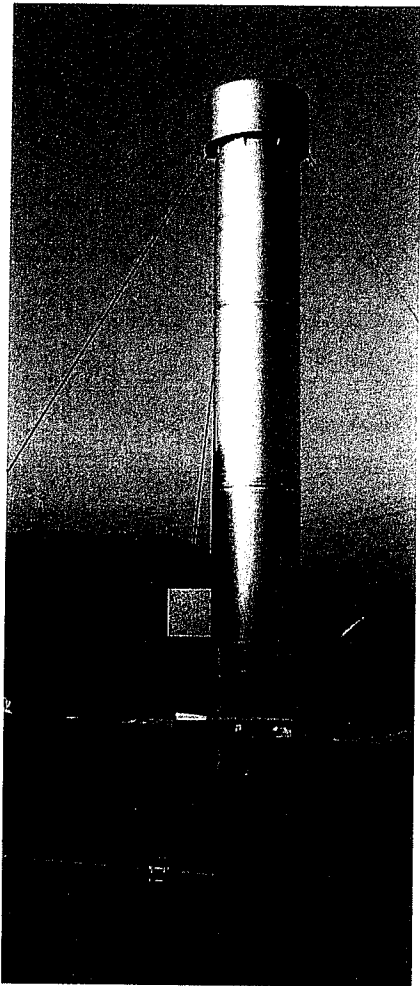
13. Reporting Requirements

The facility is required to annually report biogas combusted and calculate emissions at the facility and any entries in the upset log as required by Condition G15. The annual report may also be required to include emission estimates for greenhouse gases (GHG) emitted by way of the applicable requirements in ODEQ Division 215.

14. Public Notice

The draft permit was on public notice from July 25, 2011 to August 30, 2011. No written comments were submitted during the 35-day comment period.

AAT-FLARE FA 50 – 1.500



medium:
min. gas pressure:
firing temperature
sound level:

Biogas
> 25 mbar
approx. 900 °C
65 dBA

construction in stainless steel, gas-contacted parts in Mat. no. 1.4571, combustion chamber in Mat. no. 1.4828, others in Mat. no. 1.4301.
consisting of base plate, riser pipe with connection flange, housing for ignition device, safety equipment, flare housing with injector, mixing and burning chamber, wind shield.

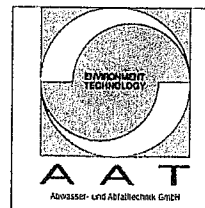
Equipment:

- Automatic ignition device (ignition transformer 7,5 kV)
- Automatic electrical main valve, slow opening, fast closing, with throughput adjustment
220 / 240 V, 50 / 60 Hz, closed on put cut off
Operation pressure: 0–200 mbar
Ambient temperature: –10 +60°C
Protection class: IP 54 nach IEC 529
- Manual butterfly valve
- Condensate drain with ballvalve 1"
- Flame arrester, **BAM-approved**, body made of cast iron GS-C 25, with a removable flame arrester cage, double removable safety fuse, straight version, rust cage and safety strip 0,15 mm made 1.4571 stainless steel, gap 0,7 mm. Cover made of St 37-2, cover gasket of NBR, nuts and bolts SS306. Flange connections drilled in accordance to DIN 2501 PN 10, shape C.

Gas input above ground
Mounting on building site foundation

type	throughput m³/h	thermal rating kW	height mm	gas connection DN
FA < 30	on request			
FA 50	50 - 70	325 - 455	4.000	50
FA 150	70 - 180	455 – 1.170	4.000	65
FA 250	180 - 250	1.170 – 1.950	4.750	80
FA 400	250 - 400	1.950 – 2.600	5.400	100
FA 600	400 - 600	2.600 – 3.900	5.300	150
FA 800	600 - 900	3.900 – 5.850	6.500	150
FA 1.000	900 – 1.100	5.850 – 6.500	7.000	150
FA 1.500	1.100 – 1.500	6.500 – 7.500	7.900	200

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Emissions JMS 320 GS-B.L C81				Flare		Annual Total	
bhp	1468			Worst Case is presented here Use of Gas Holder (4-6 hour capacity) during maintenance will significantly reduce amount of biogas sent to flare.			
MMBTU/hr	9.3			Annual Hours 200			
MMBTU/yr	79236						
Annual Hours	8520						
	Emissions	Emission factors	Emissions	Emissions range	Emissions	Emissions range	
	g/bhp	g/hr	lb/MMBTU	lb/hr	lb/hr	tons / year	tons / year
Nox	1.1	1615	0.383	3.56	5.34 7.12	0.53 0.71	15.70 15.88
CO	2.5	3670	0.870	8.09	12.14 16.18	1.21 1.62	35.68 36.09
NMHC	0.33	484	0.115	1.07	1.07	0.45	5.00
SO2			0.092	0.86	0.86	0.37	4.03
PM			0.011	0.10	0.10	0.04	0.47