

September 15, 2020

Mark Terry
Biorem Energy LLC
1060 Cactus Drive
Pocatello, ID 83204

Re: Notice of Preliminary Decision - Authority to Construct
Facility Number: C-9639
Project Number: C-1193125

Dear Mr. Terry:

Enclosed for your review and comment is the District's analysis of Biorem Energy LLC's application for an Authority to Construct for anaerobic digester with flare and IC engines, at 20330 Road 4, Chowchilla, CA.

The notice of preliminary decision for this project has been posted on the District's website (www.valleyair.org). After addressing all comments made during the 30-day public notice period, the District intends to issue the Authority to Construct. Please submit your written comments on this project within the 30-day public comment period, as specified in the enclosed public notice.

Thank you for your cooperation in this matter. If you have any questions regarding this matter, please contact Mr. Richard Edgehill of Permit Services at (661) 392-5617.

Sincerely,



Arnaud Marjollet
Director of Permit Services

AM:rue

Enclosures

cc: Courtney Graham, CARB (w/ enclosure) via email

Samir Sheikh
Executive Director/Air Pollution Control Officer

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4800 Enterprise Way
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San Joaquin Valley Air Pollution Control District

Authority to Construct Application Review

Facility Name: Biorem Energy, LLC
Mailing Address: 1060 Cactus Drive
Pocatello, ID 83204

Date: September 14, 2020
Engineer: Richard Edgehill
Richard Karrs
Lead Engineer: *RWK 9/14/20*

Applicant: Mark Terry
Telephone: (208) 233-2515
E-Mail: mark@bioremenergy.com
Application #(s): C-9639-1-0 thru '-4-0
Project #: C-1193125
Deemed Complete: December 17, 2019

I. Proposal

Biorem Energy LLC has applied for an Authority to Construct (ATC) permit for the installation of a digester gas production and storage operation consisting of a covered lagoon anaerobic digester, digester gas conditioning and compression equipment, a digester gas storage tank (pressure vessel), and 3 IC engine/generators, a 44.8 MMBtu/hr backup flare.

Conditioned fuel grade digester gas will be injected into a gas pipeline which interconnects with PG&E. The flare will be used for onsite disposal of digester gas for backup purposes when storage capacity when injection into the gas pipeline is temporarily unavailable.

Although the digester gas operation will be located at the current site of Redtop Jerseys (facility #C-6831), it will be installed, operated, and maintained solely by Biorem Energy LLC, which has entered into various pertinent agreements with the dairy for this purpose. The responsibility of the dairy will be limited to supplying the manure feedstock and disposing of the post-digester effluent, in a manner that is consistent with its pre-existing permitted operations. In addition, the digester gas will not be used by the dairy, but will be sold to customers elsewhere.

Since the dairy and the proposed digester gas operation will be separately owned and operated, and belong to different two-digit Standard Industrial Classification (SIC) codes (Industry Group 24: Dairy Farms and Industry Group 49: Electric, Gas, and Sanitary Services), they are separate stationary sources, pursuant to Section 3.39 of District Rule 2201.

Three (3) natural gas-fired IC engines equipped with Selective Catalytic Reduction for NOx control will also be installed. The IC engines will be run exclusively on PUC natural gas.

The project triggers BACT and Public Notice. Offsets are not be required.

Facility C-9639 is a new Non-Major Source and therefore Rules 2520 and 2530 are not applicable. ATC C-9218-1-0 will be cancelled and replaced by the proposed ATC S-9639-1-0.

II. Applicable Rules

Rule 2201 New and Modified Stationary Source Review Rule (8/15/19)
Rule 2410 Prevention of Significant Deterioration (6/16/11)
Rule 2520 Federally Mandated Operating Permits (8/15/19)
Rule 4001 New Source Performance Standards (4/14/99)
Rule 4002 National Emissions Standards for Hazardous Air Pollutants (5/20/04)
Rule 4101 Visible Emissions (2/17/05)
Rule 4102 Nuisance (12/17/92)
Rule 4201 Particulate Matter Concentration (12/17/92)
Rule 4311 Flares (6/19/09)
Rule 4701 Internal Combustion Engines – Phase 1 (8/21/03)
Rule 4702 Internal Combustion Engines (11/14/13)
Rule 4801 Sulfur Compounds (12/17/92)
CH&SC 41700 Health Risk Assessment
CH&SC 42301.6 School Notice
Public Resources Code 21000-21177: California Environmental Quality Act (CEQA)
California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387: CEQA Guidelines

III. Project Location

The proposed equipment will be located at 21463 Road 4, Chowchilla, CA. The equipment will not be located within 1,000 feet of the outer boundaries of any K-12 schools. The public notification requirement of California Health and Safety Code §42301.6 is therefore not applicable to this project.

IV. Process Description

C-9639-1-0:

Anaerobic Digester System

An anaerobic digester is a sealed basin or tank that is designed to accelerate and control the decomposition of organic matter by microorganisms in the absence of oxygen. Anaerobic decomposition results in the conversion of organic compounds in the substrate into methane (CH₄), carbon dioxide (CO₂), and water rather than intermediate volatile organic compounds (VOC). The gas generated by this process will be identified as digester gas in this project but may otherwise be referred to as biogas or waste gas.

The digester gas is expected to be comprised of 60-70% CH₄ and 30-40% CO₂ but may contain small amounts of nitrogen (N₂), oxygen (O₂), hydrogen sulfide (H₂S), ammonia (NH₃) and trace

amounts of various VOC that remain from incomplete digestion of the volatile solids. Since the primary constituent of digester gas is methane (also the main component of natural gas), digester gas can be treated to remove H₂S and other impurities and used as fuel.

The proposed digester system will consist of a covered lagoon and will process only manure generated by the cattle at the host dairy (Redtop Jerseys LLC). The manure will be flushed from the cow housing areas at the dairy to a solid separation system prior to the digester system. The mechanical separation system will remove fibrous solids from the manure. After the separation system, the liquid manure will gravity flow into the digester. The liquid effluent from the digester will be pumped to the existing storage ponds at the dairy for use to irrigate and fertilize dairy's cropland.

The digester lagoon will be approximately 460 ft long, 360 ft wide, and 24 ft deep, with a side slope of 2:1 and total capacity of approximately 20,700,000 gallons. The lagoon will be fitted with a high-density polyethylene (HDPE) membrane cover, under which a gas collection system consisting of perforated piping will be installed. The flexible digester cover also serves as a temporary storage facility for raw digester gas. A pressure/vacuum valve will be used to regulate the volume of gas stored. When the gas is not continuously transferred out of the digester, it accumulates in the headspace under the digester cover. The cover gradually inflates as more gas accumulates under it; thus extending the available storage capacity. The applicant has stated that the proposed digester cover is capable of holding up to 3 days' worth of raw gas, assuming the digester is operating at maximum capacity. Except in the event of an emergency, the gas will be transferred out of the digester before the maximum holding capacity is reached. Venting of raw digester gas under non-emergency situations is not permitted.

Biogas Conditioning

From the gas collection system, the raw digester gas is piped into the gas conditioning and compression system where it is upgraded to fuel grade quality and compressed to the desired storage/transportation pressure. The conditioning system consists of the following steps, in the order shown:

- (1) H₂S removal using iron sponge scrubbers
- (2) Moisture removal using a knockout vessel and chiller
- (3) VOC and siloxane removal using activated carbon adsorption beds
- (4) Carbon dioxide removal using polymeric membranes

Iron sponge scrubbers contain a hydrated form of iron oxide which reacts with the H₂S in the biogas, resulting in the precipitation of sulfur in the form iron sulfide. The knockout vessel or drum uses gravitational force to remove liquid droplets suspended in the gas stream; while a chiller dehumidifies the gas by cooling (i.e. a drop in temperature causes water vapor content to condense out as liquid). Activated carbon removes VOC and siloxanes by adsorption.

The polymeric membranes used for carbon dioxide removal are designed to retain methane while allowing carbon dioxide to permeate through. Other trace impurities such as H₂S and water vapor will also permeate through the membrane more readily than methane, thus further purifying the retained methane. VOC is generally less permeable than methane, hence any trace VOC remaining in the biogas is expected to be mostly retained together with the methane. Membrane separation units are expected to remove up to 98% of the carbon dioxide present in

biogas. The waste gas (i.e. tail gas) from this separation process will thus consist primarily of carbon dioxide, with small quantities of methane, and trace amounts of H₂S. This tail gas will be vented without further processing or treatment as it does not contain a recoverable amount of methane or significant quantities of any pollutants.

Standby Flare

The proposed standby flare is primarily intended to be used in situations when gas injection onto the pipeline is temporarily unavailable. Therefore, the flare will only combust gas after it has been treated, and have a sulfur content not exceeding 1 gr S/100 scf. The proposed gas throughputs are

$$\begin{aligned}\text{Gas throughput} &= (64,000 \text{ scf/hr}) \times (500 \text{ hr/yr}) \\ &= (32,000,000 \text{ scf/yr}) / (1 \times 10^6 \text{ scf/MMscf}) \\ &= 32.0 \text{ MMscf/yr}\end{aligned}$$

$$\begin{aligned}\text{Heat input} &= (32,000,000 \text{ scf/yr}) \times (700 \text{ Btu/scf}) / (1 \times 10^6 \text{ Btu/MMBtu}) \\ &= 22,400 \text{ MMBtu/yr}\end{aligned}$$

S-9639-2-0 through '4-0

IC Engines Generators

The project authorizes the installation of three (3) 2146 hp 16 cylinder lean-burn IC engines fired exclusively on PUC natural gas. The engines will be equipped with SCR and a Johnson Mathey oxidation catalyst.

The IC engines will provide electrical power to the dairy.

A commissioning period (7 hr/day, 70 hr/yr) will be authorized in order to tune the IC engine before the SCR is installed to avoid damaging the SCR and to smooth engine operation to conform within engine/SCR specification and permit requirements. Neither the SCR nor the oxidation catalyst are expected to be operational during commissioning.

V. Equipment Listing

C-9639-1-0: DIGESTER GAS PRODUCTION AND STORAGE OPERATION CONSISTING OF ONE COVERED LAGOON ANAEROBIC DIGESTER (460 FT X 360 FT X 24 FT), ONE 44.8 MMBTU/HR BACKUP FLARE; AND PERMIT EXEMPT GAS COLLECTION, CONDITIONING, AND STORAGE EQUIPMENT INCLUDING HYDROGEN SULFIDE (H₂S) REMOVAL SCRUBBER(S), KNOCKOUT VESSEL(S), COMPRESSOR(S), CHILLER(S), ACTIVATED CARBON ADSORPTION VESSEL(S), CARBON DIOXIDE SEPARATION MEMBRANE UNIT(S), AND STORAGE TANK(S)/PRESSURE VESSEL(S)

C-9639-2-0: 2,146 BHP MTU MODEL 12V4000L64 NATURAL GAS-FIRED LEAN-BURN IC ENGINE WITH AN OXIDATION CATALYST AND A SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM; POWERING AN ELECTRICAL GENERATOR

C-9639-3-0: 2,146 BHP MTU MODEL 12V4000L64 NATURAL GAS-FIRED LEAN-BURN IC ENGINE WITH AN OXIDATION CATALYST AND A SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM; POWERING AN ELECTRICAL GENERATOR

C-9639-4-0: 2,146 BHP MTU MODEL 12V4000L64 NATURAL GAS-FIRED LEAN-BURN IC ENGINE WITH AN OXIDATION CATALYST AND A SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM; POWERING AN ELECTRICAL GENERATOR

VI. Emission Control Technology Evaluation

Digester Gas Treatment

As previously stated, digester gas contains VOC and H₂S. Under normal operation, the digester system will capture 100% of the produced digester gas, including any entrained pollutants. The digester gas will then be treated and conditioned before injection into pipeline or flaring. The treatment and conditioning process will significantly reduce the proportions of VOC and H₂S in the finished gas.

H₂S removal will be accomplished using at least two H₂S iron sponge scrubbers in series. An iron sponge scrubber consists of a vessel containing a hydrated form of iron oxide impregnated onto wood shavings or similar substrate. As the biogas passes through the iron sponge material, H₂S reacts with the iron oxide, resulting in the precipitation of sulfur in the form iron sulfide. The H₂S concentration will be reduced from a maximum of 4,000 ppmv in raw digester gas to a maximum of 4 ppmv in the treated gas.

Final treatment and conditioning will be accomplished using a series of at least two activated carbon adsorption vessels. Activated carbon has a large number of pores, which greatly increase the surface area for adsorption. Contaminants in the gas diffuse into these pores and are retained on the carbon surface due to both chemical and physical forces. The carbon adsorption vessels are primarily intended for the removal of VOC and siloxanes. The VOC control efficiency for carbon adsorption systems is generally 99% or greater. The proposed systems are expected to be particularly robust since siloxane is a catalyst poison that must be reduced to near zero levels in order for biogas to meet vehicle fuel standards.

Tail Gas

As previously discussed, tail gas exhausted from the carbon dioxide separation membrane units consists primarily of carbon dioxide, small quantities of methane, and trace amounts of VOC and H₂S. VOC and H₂S will have been reduced to trace levels using activated carbon before the biogas enters the membrane separation units. Since VOC has even lower permeability than methane, membrane treated tail gas is expected to contain ~ 5 % of the VOC content of membrane inlet gas. H₂S has a higher permeability than methane, hence a significant proportion

of any H₂S remaining in the inlet gas (to the membrane) is expected to permeate through the membrane and be emitted in the tail gas.

The applicant has provide the following data for the tail gas:

- Flow rate = 90 scfm, 5,400 ft³/hr
- Composition = 97.5 % CO₂, 1.6% CH₄, and < 3 ppm H₂S

In addition, it will be assumed that a maximum of 5% of the VOC in the CO₂ membrane inlet gas will be emitted in the tail gas.

Based on the above data and assumption, as well as other assumptions as stated in Section VII.A of this evaluation, the maximum daily emissions of VOC and H₂S in tail gas are estimated as follows:

VOC

- Maximum VOC content in tail gas (TG) = 0.005% by weight (10% VOC in raw gas → 99% removal by activated carbon units → 95% removal by CO₂ membranes = 10 x 0.01 x 0.05), thus:

$$\frac{0.00005 \text{ lb} - \text{VOC}}{1 \text{ lb} - \text{TG}} \times \frac{(0.016 \times 16 + 0.975 \times 44) \text{ lb} - \text{TG}}{\text{lb} - \text{mol}} \times \frac{\text{lb} - \text{mol}}{379.5 \text{ ft}^3} \times \frac{5,400 \text{ ft}^3}{\text{hr}} \times \frac{24 \text{ hrs}}{\text{Day}} = \frac{0.7 \text{ lb} - \text{VOC}}{\text{Day}}$$

H₂S

$$\frac{3 \text{ ft}^3 \text{ H}_2\text{S}}{10^6 \text{ ft}^3 \text{ TG}} \times \frac{34.06 \text{ lb H}_2\text{S}}{\text{lb} - \text{mol}} \times \frac{\text{lb} - \text{mol}}{379.5 \text{ ft}^3} \times \frac{5,400 \text{ ft}^3}{\text{hr}} \times \frac{24 \text{ hrs}}{\text{Day}} = \frac{0.03 \text{ lb} - \text{H}_2\text{S}}{\text{Day}}$$

As shown in the calculations above, the maximum VOC and H₂S emissions from tail gas are expected to be less than 2 lb/day each. The venting of tail gas is thus a low emitting unit that is not subject to permit requirements or emission controls.

Standby Flare

The flare will only combust gas treated to remove sulfur, VOCs, and CO₂ when the gas pipeline is unavailable. The VOC control efficiency of the flare is required to be 98% (BACT). Visible emissions are not expected to exceed Ringelmann 1 or 20% opacity.

IC Engines

The proposed PUC natural gas-fired IC engines will be equipped with:

- Turbocharger
- Aftercooler
- Air/Fuel Ratio or an O₂ Controller
- Lean Burn Technology
- Positive Crankcase Ventilation (PCV) or 90% efficient control device
- Selective Catalytic Reduction (SCR)

The turbocharger reduces the NO_x emission rate from the engine by increasing the efficiency and promoting more complete burning of the fuel.

The aftercooler cools the air after it leaves the turbocharger, reducing the engine's inlet air temperature. By reducing the inlet air temperature, the peak combustion temperature is lowered, which reduces the formation of thermal NO_x.

The fuel/air ratio controller (oxygen controller) is used to maintain the amount of oxygen in the exhaust stream to optimize engine operation and catalyst function.

Lean burn technology increases the volume of air in the combustion process and therefore increases the heat capacity of the mixture. This technology also incorporates improved swirl patterns to promote thorough air/fuel mixing. This in turn lowers the combustion temperature and reduces NO_x formation.

The PCV system reduces crankcase VOC and PM₁₀ emissions by at least 90% over an uncontrolled crankcase vent.

A Selective Catalytic Reduction (SCR) system operates as an external control device where flue gases and a reagent, in this case urea, are passed through an appropriate catalyst. Urea, will be injected upstream of the catalyst where it is converted to ammonia. The ammonia is used to reduce NO_x, over the catalyst bed, to form elemental nitrogen and other by-products. The use of a catalyst typically reduces the NO_x emissions by up to 90%.

The IC engines also include oxidation catalysts which converts CO and VOC emissions to CO₂ and water. The oxidation catalyst is located prior to the urea injection site since the oxidation catalyst would otherwise convert the excess ammonia into NO_x. Based on the pre- and post-commissioning emission factors supplied by the applicant, the control efficiency of the oxidation catalyst is expected to be 64% for CO and 90% for VOC.

IC engine manufacturer details are included in **Attachment I**.

VII. General Calculations

A. Assumptions

C-9639-1-0

- District Policy SSP 2015 specifies that fugitive VOC emissions are not assessed for piping and components handling fluid streams with a VOC content of 10% or less by weight. The results of digester gas fuel analyses from similar operations have consistently demonstrated very low VOC content (less than 1% by weight). Therefore, the fugitive VOC emissions from the digester system are considered negligible, consistent with District Policy SSP 2015.
- Emissions from post-digester solids are considered negligible.
- Digester gas properties:

- Higher Heating Value = 700 Btu/scf (Based on 70% methane content, also used in other similar District projects)
- EPA F-factor = 9,100 dscf/MMBtu (dry, adjusted to 60 °F), (Estimated based on previous digester gas fuel analyses for source tests)
- Flare parameters:
 - Maximum operation schedule is 24 hours/day (1075.2 MMBtu/day) and 500 hours/year (22,400 MMBtu/yr)
 - Maximum gas flow rate is 64,000 scf/hr (assuming acf ~ scf)
 - Equivalent maximum heat input rate is 44.8 MMBtu/hr (64,000 scf/hr x 700 Btu/scf)
 - VOC destruction efficiency = 98%¹

IC Engines C-9639-2 thru '-4

- Operational time 24 hours/day and 365 days per year.
- Commissioning period: 7 hr/day, 70 hr/yr
- Worst case daily operation: 7 hr commissioning, 17 hr/day steady state
- Annual operation 70 hr/yr commissioning, 8690 hr/yr steady state (8760 total hours of operation)
- Thermal efficiency of engine: commonly ≈ 35%
- PM_{2.5} emissions from the gas-fired engines are assumed to be equal to PM10 emissions.
- Ammonia slip: 10 ppmv

B. Emission Factors

C-9639-1 Flare:

The NO_x emission factor (0.06 lb/MMBtu) is based on the Industry Standard NO_x emission factor for digester gas flares² and District practice for permitting digester gas flares.

The SO_x emission factor is based on pipeline natural gas sulfur content of 1 gr S/100 scf i.e. the flare will be used only when the gas pipeline is unavailable.

¹ District BACT Guideline 5.8.12.

² John Zink® has previously indicated that the industry standard NO_x emission factor for biogas flares is 0.06 lb-NO_x/MMBtu. See: John Zink (March 1998) Ultra-Low Emission Enclosed Landfill Gas Flare – A Full Scale Factory Test. Presented at the **Solid Waste Association of North America (SWANA)** 21nd Annual Landfill Gas Symposium, Austin, Texas, March 1998.

https://www.johnzinkhamworthy.com/wp-content/uploads/tp_UltraLowEmission.pdf.

John Zink® also recently stated that one of their standard flares is expected to comply with the 0.06 lb-NO_x/MMBtu emission limit when flaring low Btu gas from a digester gas refining process. See: Sacramento Metropolitan Air Quality management District (SMAQMD) BACT determination for flaring low Btu digester gas (July 25, 2017):

<http://www.airquality.org/StationarySources/Documents/Flare%20Waste%20Gas%20Low%20BTU%20BACT%20140.pdf>

The emission factors for PM₁₀ (0.015 lb/MMBtu) and CO (0.046 lb/MMBtu) are based on the values given for landfill gas-fired flares in AP-42, Draft Section 2.4 Municipal Solid Waste Landfills (October 2008).

The VOC emission factor for the digester gas-fired flare (0.006 lb/MMBtu) was based on the VOC emission for landfill gas and digester gas-fired flares (2.50 g/MMBtu or 0.0055 lb/MMBtu) from the California Air Resources Board (ARB) Low Carbon Fuel Standard (LCFS) pathways for the production of LCFS fuels from landfill gas and digester gas.³

Additionally, as noted above, the VOC content of dairy digester gas is generally negligible to very low. For example, for the quarterly dairy digester gas fuel analyses that were recently performed in August 2018 for Facilities S-8596, S-8637, and S-8638 the only hydrocarbon measured was methane and no VOCs were detected (per project S-1171914); therefore, using a VOC emission factor of 0.006 lb/MMBtu will result in a reasonably conservative estimate of VOC emissions from the flare.

The proposed emission factors for NO_x, CO, and VOC are conservative as they are greater than the emission factors of 0.0426 lb-NO_x/MMBtu, 0.0022 lb-CO/MMBtu, and 0.0023 lb-VOC/MMBtu measured during the 11/17/2010 source test performed for the dairy digester gas flare at Facility N-6311 (Fiscalini Farms and Fiscalini Dairy), and the proposed NO_x emission factor is also greater than the emission factor given for landfill gas-fired flares in AP-42, Draft Section 2.4 Municipal Solid Waste Landfills (October 2008). As shown in the table below, the NO_x emission factor is consistent with the permitted NO_x emission limits for other digester gas-fired flares and the VOC emission factor is conservative compared to the VOC emission factors that have been used for other digester gas-fired flares.

³ Examples of ARB Low Carbon Fuel Standard (LCFS) pathways for landfill gas and digester gas are available at: https://www.arb.ca.gov/fuels/lcfs/092309lcfs_lfg_lng.pdf and <https://www.arb.ca.gov/fuels/lcfs/2a2b/apps/www2bm-rpt-082514.pdf> ; Also see: <https://www.arb.ca.gov/fuels/lcfs/2a2b/2a-2b-apps.htm>

Examples of NO_x and VOC Emission Limits for Digester Gas-Fired Flares			
Facility/Source	Description	NO _x Emission Factor (lb/MMBtu)	VOC Emission Factor (lb/MMBtu)
Fiscalini Farms and Fiscalini Dairy: Dairy Digester Gas Flare	11/17/2010 Source Test Results for Permit N-6311-10	0.0426	0.0023
Hilmar Cheese Company: Cheese Wastewater Digester Gas Flare	Emission Limits for Permit N-1275-23-9	0.06	0.002
E&J Gallo Winery: Winery Wastewater Digester Gas Flare	Emission Limits for Permit C-447-226-13	0.06	0.002
Tulare City Wastewater Treatment Plant: Municipal Wastewater Digester Gas Flare	Emission Limits for Permit S-548-33	0.06	0.0027
South Coast Air Quality Management District (SCAQMD) Digester gas Flares ⁴	Typical SCAQMD permit limit for NO _x from digester gas flares and SCAQMD source test data for VOC from digester gas flares	0.06	0.0045 (10 ppmv @ 3% O ₂ as CH ₄)

It is reasonable to use the AP-42 emission factors for PM and CO from landfill gas-fired flares for the digester gas backup flare because landfill gas and digester gas are both types of digester gas, so they are expected to have similar properties and emissions. One of the main differences between landfill gas and digester gas is that digester gas will tend to have higher methane content and heating value, which would tend to increase thermal NO_x emissions from combustion of digester gas compared to landfill gas, while decreasing emissions that result from incomplete combustion, such as PM, CO, and VOC. Combustion of gaseous fuels will generally result in negligible to very low PM emissions and the chance of PM becoming entrained in the digester gas after collection from a digester system is insignificant.

The emission factors that will be used to calculate the potential to emit for the digester gas-fired backup flare are shown in the table below.

⁴ Information on SCAQMD biogas flares NO_x and VOC emissions taken from the SCAQMD Final Environmental Assessment for Proposed Amended Rule 1110.2 – Emissions from Gaseous and Liquid-Fueled Internal Combustion Engines (December 2007), Appendix C. <http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2008/rule-1110.2/appc130.pdf?sfvrsn=4>

Emissions Factors for Digester System Backup Flare			
Pollutant	lb/MMBtu	lb/scf*	Source
NO _x	0.06	4.20 x 10 ⁻⁵	Industry Standard/District Practice for Permitting Digester gas Flares
SO _x		1.43 x 10 ^{-6**}	Pipeline quality natural gas
PM ₁₀	0.015	1.05 x 10 ⁻⁵	AP-42 Draft Table 2.4.4 (October 2008) (Value for Landfill Gas Flares)
CO	0.046	3.22 x 10 ⁻⁵	AP-42 Draft Table 2.4.4 (October 2008) (Value for Landfill Gas Flares)
VOC	0.006	4.20 x 10 ⁻⁶	Based on ARB LCFS Pathway Digester gas Flare VOC EF/Also Conservatively Assumed to be similar to Digester Gas-Fired Turbines

*lb/scf equivalent = lb/MMBtu x 0.0007 MMBtu/scf.

**SO_x Emission Factor Calculation

$$1 \text{ gr S}/100 \text{ scf} \times \text{lb S}/7000 \text{ gr S} = 1.43 \times 10^{-6} \text{ lb/scf}$$

IC Engines C-9639-2-0 thru '-4-0

Emission Factors during the Commissioning Period (Startup and Shutdown):

The commissioning period precedes normal (steady state) operation of a power plant. Activities conducted during the commissioning period typically include: checking all mechanical, electrical, and control systems for the units and related equipment; confirming the performance measures specified for the equipment; test firing the units; and tuning of the units and the generators. The early stages of commissioning are conducted prior to the installation of the emission control equipment to prevent damage to the control equipment. Because emission control devices are not in place and functioning during commissioning, higher emission limits are required during this time.

The EFs for NO_x, CO, and VOC for the commissioning period are emissions from the engine without an SCR system and oxidation catalyst in place and were provided by the engine supplier (**Attachment II**). The EFs for SO_x, PM₁₀, and ammonia slip for commissioning and normal operation are assumed to be the same EFs as during normal operation. The calculation for SO_x is as follows:

**SO_x is calculated as follows:

$$0.00285 \frac{\text{lb} - \text{SO}_x}{\text{MMBtu}} \times \frac{1 \text{ MMBtu}}{1,000,000 \text{ Btu}} \times \frac{2,542.5 \text{ Btu}}{\text{bhp} - \text{hr}} \times \frac{1 \text{ bhp input}}{0.35 \text{ bhp out}} \times \frac{453.6 \text{ g}}{\text{lb}} = 0.0094 \frac{\text{g} - \text{SO}_x}{\text{bhp} - \text{hr}}$$

Commissioning Period Emission Factors for PUC Gas-Fired Engine			
Pollutant	g/hp-hr	ppmvd* (@ 15%O ₂)	Source
NO _x	1.0	79 ppmvd	Technical Data Sheet Attachment II
SO _x	0.0094		Mass Balance Equation Below
PM ₁₀	0.033	--	Applicant proposed
CO	3	389 ppmvd	Technical Data Sheet Attachment II
VOC	0.7	159 ppmvd as CH ₄	Technical Data Sheet Attachment II

*District calculator with 35% engine efficiency, **Attachment II**

Emission Factors during Normal Operation after the Commissioning Period:

Emission Factors for Digester Gas-Fired Engines (Normal Operation)			
Pollutant	g/hp-hr	ppmvd* (@ 15%O ₂)	Source
NO _x	0.02	2 ppmvd	BACT Requirement; Proposed by Applicant – See equation below
SO _x	0.0094		Mass Balance Equation Above
PM ₁₀	0.033	--	Proposed by Applicant
CO	0.07	9 ppmvd	Manufacturer
VOC	0.02	5 ppmvd as CH ₄	Manufacturer
NH ₃	0.05	10 ppmvd	Manufacturer

*District calculator with 35% engine efficiency, **Attachment II**

C. Calculations

1. Pre-Project Potential to Emit (PE1)

C-9639-1-0 thru '4-0

Since these are all new emissions units, PE1 = 0 for all pollutants.

2. Post Project Potential to Emit (PE2)

C-9639-1-0

Since fugitive emissions from the digester system, gas conditioning equipment, and gas transmission are considered negligible, combustion of the digester gas in the flare will be the only source of quantifiable emissions from the proposed operation.

The potential to emit for the flare will be calculated based on the maximum flare gas flow rate of 64,000 scf per hour, a maximum daily operation 24 hours, and a maximum annual operation limit of 500 hours.

Daily PE

The daily PE for each pollutant is calculated as follows:

$$PE \text{ (lb/day)} = [EF \text{ (lb/scf)} \times \text{Gas flow rate (scf/hr)} \times \text{Operation schedule (hrs/day)}]$$

The daily PE is summarized in the following table:

Daily PE2 Summary							
Pollutant	Emission Factor (lb/scf)	x	Gas Flow Rate (scf/hr)	x	Op. Schedule (hrs/day)	=	PE2 (lb/day)
NO _x	4.20E-5	x	64,000	x	24	=	64.5
SO _x	1.43E-6	x	64,000	x	24	=	2.2
PM ₁₀	1.05E-5	x	64,000	x	24	=	16.1
CO	3.22E-5	x	64,000	x	24	=	49.5
VOC	4.20E-6	x	64,000	x	24	=	6.5

Maximum Daily Gas Throughput and Heat Input

$$\begin{aligned} \text{Gas throughput} &= (64,000 \text{ scf/hr}) \times (24 \text{ hr/day}) \\ &= (1,536,000 \text{ scf/day}) / (1 \times 10^6 \text{ scf/MMscf}) \\ &= 1.536 \text{ MMscf/day} \end{aligned}$$

$$\begin{aligned} \text{Heat input} &= (1,536,000 \text{ scf/day}) \times (700 \text{ Btu/scf}) / (1 \times 10^6 \text{ Btu/MMBtu}) \\ &= 1,075.2 \text{ MMBtu/day} \end{aligned}$$

Annual PE

The annual PE for each pollutant is calculated as follows:

$$PE \text{ (lb/yr)} = [EF \text{ (lb/scf)} \times \text{Maximum gas flared annually (MMscf/yr)} \times 10^6 \text{ scf/MMscf}]$$

The annual PE is summarized in the following table:

Annual PE2 Summary							
Pollutant	Emission Factor (lb/scf)	x	Gas Flow Rate (scf/hr)	x	Op. Schedule (hrs/yr)	=	PE2 (lb/yr)
NO _x	4.20E-5	x	64,000	x	500	=	1,344
SO _x	1.43E-6	x	64,000	x	500	=	46
PM ₁₀	1.05E-5	x	64,000	x	500	=	336
CO	3.22E-5	x	64,000	x	500	=	1,030
VOC	4.20E-6	x	64,000	x	500	=	134

Maximum Annual Gas Throughput and Heat Input

$$\begin{aligned} \text{Gas throughput} &= (64,000 \text{ scf/hr}) \times (500 \text{ hr/yr}) \\ &= (32,000 \text{ scf/yr}) / (1 \times 10^6 \text{ scf/MMscf}) = 32.0 \text{ MMscf/yr} \end{aligned}$$

$$\text{Heat input} = (32,000,000 \text{ scf/yr}) \times (700 \text{ Btu/scf}) / (1 \times 10^6 \text{ Btu/MMBtu})$$

$$= 22,400 \text{ MMBtu/yr}$$

C-9639-2 thru'-4 (each) IC Engines

Commissioning Period

Post Project Emissions (PE2)						
Pollutant	Emissions Factor (g/bhp-hr)	Rating (bhp)	Daily Hours of Operation (hrs/day)	Annual Hours of Operation (hrs/year)	Daily PE2 (lb/day)	Annual PE2 (lb/yr)
NO _x	1.0	2146	7	70	33.1	331
SO _x	0.0094	2146	7	70	0.3	3
PM ₁₀	0.033	2146	7	70	1.1	11
CO	3	2146	7	70	99.4	994
VOC	0.7	2146	7	70	23.2	232

Normal Operation

Post Project Emissions (PE2)						
Pollutant	Emissions Factor (g/bhp-hr)	Rating (bhp)	Daily Hours of Operation (hrs/day)	Annual Hours of Operation (hrs/year)	Daily PE2 (lb/day)	Annual PE2 (lb/yr)
NO _x	0.02	2146	17	8690	1.6	822
SO _x	0.0094	2146	17	8690	0.8	386
PM ₁₀	0.033	2146	17	8690	2.7	1,357
CO	0.07	2146	17	8690	5.6	2,878
VOC	0.02	2146	17	8690	1.6	822

Steady state and commissioning

C-9639-2, '-3, and '-4 (each)

PE2		
	Daily Emissions (lb/day)	Annual Emissions (lb/year)
NO _x	33.1 + 1.6 = 34.7	331 + 822 = 1,153
SO _x	0.3 + 0.8 = 1.1	3 + 386 = 389
PM ₁₀	1.1 + 2.7 = 3.8	11 + 1357 = 1,368
CO	99.4 + 5.6 = 105.0	994 + 2,878 = 3,872
VOC	23.2 + 1.6 = 24.8	232 + 822 = 1,054

NH₃: 0.05 g/bhp-hr x 2146 hp x lb/453.6 g x 24 = 5.7 lb/day, 2,072 lb/yr

Emissions profiles are included in **Attachment III**.

3. Pre-Project Stationary Source Potential to Emit (SSPE1)

Pursuant to District Rule 2201, the SSPE1 is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of Emission Reduction Credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions (AER) that have occurred at the source, and which have not been used on-site.

Since this is a new facility, there are no valid ATCs, PTOs, or ERCs at the Stationary Source; therefore, the SSPE1 is equal to zero.

4. Post-Project Stationary Source Potential to Emit (SSPE2)

Pursuant to District Rule 2201, the SSPE2 is the PE from all units with valid ATCs or PTOs at the Stationary Source and the quantity of ERCs which have been banked since September 19, 1991 for AER that have occurred at the source, and which have not been used on-site.

SSPE2 (lb/year)					
Permit Unit	NO _x	SO _x	PM ₁₀	CO	VOC
C-9639-1-0	1344	46	336	1030	134
C-9639-2-0	1153	389	1368	3872	1054
C-9639-3-0	1153	389	1368	3872	1054
C-9639-4-0	1153	389	1368	3872	1054
SSPE2	4,803	1,213	4,440	12,646	3,296

5. Major Source Determination

Rule 2201 Major Source Determination:

Pursuant to District Rule 2201, a Major Source is a stationary source with a SSPE2 equal to or exceeding one or more of the following threshold values. For the purposes of determining major source status the following shall not be included:

- any ERCs associated with the stationary source
- Emissions from non-road IC engines (i.e. IC engines at a particular site at the facility for less than 12 months)
- Fugitive emissions, except for the specific source categories specified in 40 CFR 51.165

Rule 2201 Major Source Determination (lb/year)						
	NO_x	SO_x	PM₁₀	PM_{2.5}	CO	VOC
SSPE1	0	0	0	0	0	0
SSPE2	4,803	1,213	4,440	4,440	12,646	3,296
Major Source Threshold	20,000	140,000	140,000	140,000	200,000	20,000
Major Source?	No	No	No	No	No	No

Note: PM2.5 assumed to be equal to PM10

As seen in the table above, the facility is not an existing Major Source and is not becoming a Major Source as a result of this project.

Rule 2410 Major Source Determination:

The facility or the equipment evaluated under this project is not listed as one of the categories specified in 40 CFR 52.21 (b)(1)(iii). Therefore the PSD Major Source threshold is 250 tpy for any regulated NSR pollutant.

PSD Major Source Determination (tons/year)						
	NO₂	VOC	SO₂	CO	PM	PM₁₀
Estimated Facility PE before Project Increase	0	0	0	0	0	0
PSD Major Source Thresholds	250	250	250	250	250	250
PSD Major Source?	No	No	No	No	No	No

As shown above, the facility is not an existing PSD major source for any regulated NSR pollutant expected to be emitted at this facility.

6. Baseline Emissions (BE)

The BE calculation (in lb/year) is performed pollutant-by-pollutant for each unit within the project to calculate the QNEC, and if applicable, to determine the amount of offsets required.

Pursuant to District Rule 2201, BE = PE1 for:

- Any unit located at a non-Major Source,
- Any Highly-Utilized Emissions Unit, located at a Major Source,
- Any Fully-Offset Emissions Unit, located at a Major Source, or
- Any Clean Emissions Unit, located at a Major Source.

otherwise,

BE = Historic Actual Emissions (HAE), calculated pursuant to District Rule 2201.

C-9639-1 thru -4:

Since these are new emissions units, BE = PE1 = 0 for all pollutants.

7. SB 288 Major Modification

SB 288 Major Modification is defined in 40 CFR Part 51.165 as "any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act."

Since this facility is not a major source for any of the pollutants addressed in this project, this project does not constitute an SB 288 major modification.

8. Federal Major Modification

District Rule 2201 states that a Federal Major Modification is the same as a "Major Modification" as defined in 40 CFR 51.165 and part D of Title I of the CAA.

Since this facility is not a Major Source for any pollutants, this project does not constitute a Federal Major Modification.

9. Rule 2410 – Prevention of Significant Deterioration (PSD) Applicability Determination

Rule 2410 applies to any pollutant regulated under the Clean Air Act, except those for which the District has been classified nonattainment. The pollutants which must be addressed in the PSD applicability determination for sources located in the SJV and which are emitted in this project are: (See 52.21 (b) (23) definition of significant)

- NO₂ (as a primary pollutant)
- SO₂ (as a primary pollutant)
- CO
- PM
- PM₁₀

I. Project Emissions Increase - New Major Source Determination

The post-project potentials to emit from all new and modified units are compared to the PSD major source thresholds to determine if the project constitutes a new major source subject to PSD requirements.

The facility or the equipment evaluated under this project is not listed as one of the categories specified in 40 CFR 52.21 (b)(1)(i). The PSD Major Source threshold is 250 tpy for any regulated NSR pollutant.

PSD Major Source Determination: Potential to Emit (tons/year)						
	NO₂	VOC	SO₂	CO	PM	PM₁₀
Total PE from New and Modified Units	2.4	1.6	0.6	6.3	2.2	2.2
PSD Major Source threshold	250	250	250	250	250	250
New PSD Major Source?	N	N	N	N	N	N

As shown in the table above, the potential to emit for the project, by itself, does not exceed any PSD major source threshold. Therefore Rule 2410 is not applicable and no further analysis is required.

10. Quarterly Net Emissions Change (QNEC)

The QNEC is calculated solely to establish emissions that are used to complete the District's PAS emissions profile screen. The permits units are new and therefore QNEC = PE2/4.

VIII. Compliance Determination

Rule 2201 New and Modified Stationary Source Review Rule

A. Best Available Control Technology (BACT)

1. BACT Applicability

Pursuant to District Rule 2201, Section 4.1, BACT requirements are triggered on a pollutant-by-pollutant basis and on an emissions unit-by-emissions unit basis. Unless specifically exempted by Rule 2201, BACT shall be required for the following actions*:

- a. Any new emissions unit with a potential to emit exceeding two pounds per day,
- b. The relocation from one Stationary Source to another of an existing emissions unit with a potential to emit exceeding two pounds per day,
- c. Modifications to an existing emissions unit with a valid Permit to Operate resulting in an Adjusted Increase in Permitted Emissions (AIPE) exceeding two pounds per day, and/or
- d. Any new or modified emissions unit, in a stationary source project, which results in an SB 288 Major Modification or a Federal Major Modification, as defined by the rule.

*Except for CO emissions from a new or modified emissions unit at a Stationary Source with an SSPE2 of less than 200,000 pounds per year of CO.

a. New emissions units – PE > 2 lb/day

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As shown in Section VII.C.2 of this evaluation, the applicant is proposing to install a new digester system with a standby flare. The PE for the proposed flare is greater than 2 lb/day for NO_x, SO_x, PM₁₀, CO, and VOC. However, the flare is a control device for VOC emissions from the digester. VOC is the only pollutant from the emission unit (i.e. digester). NO_x, SO_x, PM₁₀, and CO emissions are incidental to the control device (i.e. byproducts of combustion in the flare). In accordance with District practice, BACT requirements are not applicable to control devices. Collateral emissions resulting solely from a control device are therefore not subject to BACT requirements. BACT is therefore triggered only for VOC.

C-9639-2-0 thru -4-0

As seen in Section VII.C.2 above, the applicant is proposing to install new natural gas-fired IC engines with PEs greater than 2 lb/day for NO_x, PM₁₀, CO, and VOC. BACT is triggered for NO_x, PM₁₀, and VOC only since the PEs are greater than 2 lb/day. However, BACT is not triggered for CO since the SSPE2 for CO is not greater than 200,000 lb/year, as demonstrated in Section VII.C.5 above.

b. Relocation of emissions units – PE > 2 lb/day

As discussed in Section I above, there are no emissions units being relocated from one stationary source to another; therefore BACT is not triggered.

c. Modification of emissions units – AIPE > 2 lb/day

As discussed in Section I above, there are no modified emissions units associated with this project. Therefore BACT is not triggered.

d. SB 288/Federal Major Modification

As discussed in Sections VII.C.7 and VII.C.8 above, this project does not constitute an SB 288 and/or Federal Major Modification for any pollutant. Therefore BACT is not triggered for any pollutant.

2. BACT Guideline

C-9639-1-0

BACT Guideline 5.8.12 applies to dairy manure digesters with backup/emergency flares (see **Attachment IV**).

C-9639-2-0 thru '-4-0

The BACT Guideline for the natural gas-fired IC engines has been rescinded. A project specific BACT analysis has been done (see **Attachment V**).

There is no existing BACT Guideline for an IC engine commissioning period. Therefore, a project specific BACT Analysis is done for the commissioning period.

3. Top-Down BACT Analysis

Per Permit Services policies and procedures for BACT, a top-down BACT analysis shall be performed as a part of the application review for each application subject to the BACT requirements pursuant to the District's NSR Rule.

C-9639-1-0

Pursuant to the attached BACT Analysis (see **Attachment V**), BACT has been satisfied with the following:

VOC: Open flare (98% control efficiency)

C-9639-2-0 thru '-4-0

Steady State

NOx: 2 ppmv @ 15% O₂
PM10: 0.033 g/bhp-hr
CO: 9 ppmv @ 15% O₂
VOC: 5 ppmvd @15% O₂

Commissioning Period – this project

Commissioning period not to exceed 7 hr/day, 70 hrs/yr. During the commissioning period, the operator shall perform expeditious completion of commissioning activities, and shall use good work practice standards to minimize emissions.

NOx: 79 ppmv @ 15% O₂
PM10: 0.033 g/bhp-hr
CO: 389 ppmv @ 15% O₂
VOC: 159 ppmvd @15% O₂

The BACT Analysis is included in **Attachment V**.

B. Offsets

1. Offset Applicability

Offset requirements shall be triggered on a pollutant by pollutant basis and shall be required if the SSPE2 equals to or exceeds the offset threshold levels in Table 4-1 of Rule 2201.

The SSPE2 is compared to the offset thresholds in the following table:

Offset Determination (lb/year)					
	NO_x	SO_x	PM₁₀	CO	VOC
SSPE2	4,803	1,213	4,440	12,646	3,296
Offset Thresholds	20,000	54,750	29,200	200,000	20,000
Offsets triggered?	No	No	No	No	No

2. Quantity of Offsets Required

As shown above, the SSPE2 is not greater than the offset thresholds for all the pollutants; therefore offset calculations are not necessary and offsets will not be required for this project.

C. Public Notification

1. Applicability

Public noticing is required for:

- a. New Major Sources, Federal Major Modifications, and SB 288 Major Modifications,
- b. Any new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any one pollutant,
- c. Any project which results in the offset thresholds being surpassed
- d. Any project with an SSIPE of greater than 20,000 lb/year for any pollutant, and/or
- e. Any project which results in a Title V significant permit modification.

a. New Major Sources, Federal Major Modifications, and SB 288 Major Modifications

New Major Sources are new facilities, which are also Major Sources. As shown in Section VII.C.5 of this evaluation, the SSPE2 is not greater than the Major Source threshold for any pollutant. Therefore, public noticing is not required for this project for new Major Source purposes.

b. PE > 100 lb/day

The PE2 for this new unit is compared to the daily PE Public Notice thresholds in the following table:

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PE > 100 lb/day Public Notice Thresholds			
Pollutant	PE2 (lb/day)	Public Notice Threshold	Public Notice Triggered?
NO _x	64.5	100 lb/day	No
SO _x	46	100 lb/day	No
PM ₁₀	16.1	100 lb/day	No
CO	49.5	100 lb/day	No
VOC	6.5	100 lb/day	No

C-9639-2-0 thru -4-0 (each)

PE > 100 lb/day Public Notice Thresholds			
Pollutant	PE2 (lb/day)	Public Notice Threshold	Public Notice Triggered?
NO _x	34.7	100 lb/day	No
SO _x	1.1	100 lb/day	No
PM ₁₀	3.8	100 lb/day	No
CO	105.0	100 lb/day	Yes
VOC	24.8	100 lb/day	No

As shown in the table above, the PE for CO is greater than 100 lb/day. Public noticing for PE > 100 lb/day purposes is therefore required.

c. Offset Threshold

The SSPE1 and SSPE2 are compared to the offset thresholds in the following table:

Offset Thresholds				
Pollutant	SSPE1 (lb/year)	SSPE2 (lb/year)	Offset Threshold	Public Notice Required?
NO _x	0	4,803	20,000 lb/year	No
SO _x	0	1,213	54,750 lb/year	No
PM ₁₀	0	4,440	29,200 lb/year	No
CO	0	12,646	200,000 lb/year	No
VOC	0	3,296	20,000 lb/year	No

As shown above, there were no thresholds surpassed with this project; therefore public noticing is not required for surpassing an offset threshold.

d. SSIPE > 20,000 lb/year

Public notification is required for any permitting action that results in a SSIPE of more than 20,000 lb/year of any affected pollutant. According to District policy, the SSIPE = SSPE2 – SSPE1. The SSIPE is compared to the SSIPE Public Notice thresholds in the following table:

SSIPE Public Notice Thresholds					
Pollutant	SSPE2 (lb/year)	SSPE1 (lb/year)	SSIPE (lb/year)	SSIPE Public Notice Threshold	Public Notice Required?
NO _x	4,803	0	4,803	20,000 lb/year	No
SO _x	1,213	0	1,213	20,000 lb/year	No
PM ₁₀	4,440	0	4,440	20,000 lb/year	No
CO	12,646	0	12,646	20,000 lb/year	No
VOC	3,296	0	3,296	20,000 lb/year	No

As shown above, the SSIPE is not greater than 20,000 lb/year for any pollutant. Public noticing for SSIPE purposes is therefore not required.

e. Title V Significant Permit Modification

Since this facility does not have a Title V operating permit, this change is not a Title V Significant Modification, and therefore public noticing is not required for a Title V Significant Modification.

2. Public Notice Action

As discussed above, public noticing is required for this project for CO emissions in excess of 100 lb/day. Therefore, public notice documents will be submitted to the California Air Resources Board (CARB) and a public notice will be electronically published on the District’s website prior to the issuance of the ATC for this equipment.

D. Daily Emission Limits (DELs)

DELs and other enforceable conditions are required by Rule 2201 to restrict a unit’s maximum daily emissions, to a level at or below the emissions associated with the maximum design capacity. The DEL must be contained in the latest ATC and contained in or enforced by the latest PTO and enforceable, in a practicable manner, on a daily basis. DELs are also required to enforce the applicability of BACT. The following DEL conditions will be placed on the ATC:

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- *Only gas treated to remove sulfur shall be burned in the flare. [District Rule 2201] N*

- *Flaring of digester gas for testing and maintenance, required regulatory purposes, and when gas pipeline is not available shall not exceed either of the following limits: 1,075.2 MMBtu (equivalent to 1.536 MMscf @ 700 Btu/scf) in any one day and 500 hours per calendar year equivalent to 22,400 MMBtu (equivalent to 32.0 MMscf @ 700 Btu/scf). [District Rules 2201 and 4102] N*
- *Emissions from the flare shall not exceed any of the following limits: 0.06 lb-NO_x/MMBtu, 0.008 lb-PM₁₀/MMBtu, 0.046 lb-CO/MMBtu, or 0.006 lb-VOC/MMBtu. [District Rule 2201]*
- *The VOC content of the digester gas shall not exceed 10% by weight. [District Rule 2201]*
- *Flare shall only combust gas containing no more than 1 gr S/100 scf. [District Rule 2201] N*

C-9639-2-0 thru '-4-0

- *IC engine shall combust only PUC-regulated natural gas. [District Rules 2201, 4702, and 4801] N*
- *Emissions from this engine during the commissioning period shall not exceed any of the following limits: 1.0 g-NO_x/bhp-hr (equivalent to 79.0 ppmvd NO_x @ 15% O₂), NO_x referenced as NO₂; 0.04 g-PM₁₀/bhp-hr; 3.0 g-CO/bhp-hr (equivalent to 389 ppmvd CO @ 15% O₂); 0.7 g-VOC/bhp-hr (equivalent to 159 ppmvd VOC @ 15% O₂), VOC referenced as methane. [District Rules 2201 and 4702] N*
- *Emissions from this engine after the commissioning period shall not exceed any of the following limits: 0.02 g-NO_x/bhp-hr (equivalent to 2 ppmvd NO_x @ 15% O₂), NO_x referenced as NO₂; 0.033 g-PM₁₀/bhp-hr; 0.07 g-CO/bhp-hr (equivalent to 9 ppmvd CO @ 15% O₂); 0.02g-VOC/bhp-hr (equivalent to 5 ppmvd VOC @ 15% O₂), VOC referenced as methane. [District Rules 2201 and 4702] N*
- *Ammonia (NH₃) emissions from this engine shall not exceed 10 ppmvd @ 15% O₂. [District Rules 2201 and 4102] N*

E. Compliance Assurance

1. Source Testing

C-9639-1-0

No source testing is required.

C-9639-2-0 thru '-4-0

The proposed 2,146 hp natural gas-fired engine are subject to District Rule 4702 - Internal

Combustion Engines. Section 6.3.2.2 of District Rule 4702 requires source testing of NO_x, CO, and VOC emissions at least once every 60 months for an agricultural spark-ignited IC engine. However, to ensure compliance, District practice and the District Source Test Policy (APR 1705), source testing for NO_x, CO, and VOC from the natural gas-fired IC engines served by SCR systems and/or oxidation catalyst shall be conducted initially and at least once every 24 months thereafter.

Since the control equipment will include an SCR system periodic testing of ammonia slip and fuel sulfur content will also be required.

The following conditions will be placed on the permit to ensure compliance:

- *Source testing to measure NO_x, CO, VOC, and ammonia (NH₃) emissions from this unit shall be conducted within 60 days of startup and at least once every 24 months of operation thereafter. [District Rules 1081, 2201, and 4702] N*
- *{3791} Emissions source testing shall be conducted with the engine operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. [District Rule 4702]*
- *For emissions source testing, the arithmetic average of three 60-consecutive-minute test runs shall apply. Each test run shall be conducted within 10 percent of 100 percent peak (or the highest achievable) load. If two of three runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. VOC emissions shall be reported as both methane and propane. NO_x, CO, VOC, and NH₃ concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702]*
- *The following methods shall be used for emissions source testing: NO_x (ppmv) - EPA Method 7E; CO (ppmv) - EPA Method 10; VOC (ppmv) - EPA Method 18, 25A or 25B; stack gas oxygen - EPA Method 3 or 3A; stack gas velocity - EPA Method 2 or EPA Method 19; stack gas moisture content - EPA Method 4; PM₁₀ (filterable and condensable) - EPA Method 201 and 202, EPA Method 201a and 202, ARB Method 5 (front half and back half), or ARB Method 5 (front half and back half) in combination with Method 501; NH₃ - BAAQMD ST-1B or SCAQMD Method 207-1. Alternative test methods as approved by EPA and the District may also be used to address the source testing requirements of this permit [District Rules 1081 and 4702]*
- *Fuel sulfur content analysis shall be performed at least annually using EPA Method 11 or EPA Method 15, as appropriate. Records of the fuel sulfur analysis shall be maintained and provided to the District upon request. [District Rules 2201 and 4702]*
- *{109} Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081]*
- *The results of each source test shall be submitted to the District and EPA within 60 days after completion of the source test. [District Rule 1081 and 4702]*

2. Monitoring

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Because of the variable composition of digester gas, monitoring of the sulfur content of the digester gas will be required. The following conditions will be placed on the permit to ensure compliance:

- *Digester gas sulfur content analysis shall be performed within 60 days of initial startup operation, and at least once every 12 months thereafter, using EPA Method 11 or EPA Method 15, as appropriate. Records of the digester gas sulfur content analysis shall be maintained and provided to the District upon request. [District Rule 2201]*
- *The sulfur content of the digester gas to be flared shall be monitored and recorded at least once every calendar quarter in which a digester gas sulfur content analysis is not performed. If quarterly monitoring shows a violation of the sulfur content limit of this permit, monthly monitoring will be required until six consecutive months of monitoring show compliance with the sulfur content limit. Once compliance with the sulfur content limit is shown for six consecutive months, then the monitoring frequency may return to quarterly. Monitoring shall not be required during periods in which the flare does not operate. [District Rule 2201]*
- *Monitoring of the digester gas sulfur content shall be performed using gas detection tubes calibrated for H₂S; a Testo 350 XL portable emission monitor; a continuous fuel gas monitor that meets the requirements specified in SCAQMD Rule 431.1, Attachment A; District-approved source test methods, including EPA Method 15, ASTM Method D1072, D4084, and D5504; District-approved in-line H₂S monitors; or an alternative method approved by the District. Prior to utilization of in-line monitors to demonstrate compliance with the digester gas sulfur content limit of this permit, the permittee shall submit details of the proposed monitoring system, including the make, model, and detection limits, to the District and obtain District approval for the proposed monitor(s). [District Rule 2201]*

C-9639-2-0 thru '-4-0

Since the proposed engine will be equipped with an SCR system, quarterly monitoring of ammonia slip will be required. The following conditions will be placed on the permit to ensure compliance:

- *The permittee shall monitor and record the stack concentration of NH₃ at least once every calendar quarter in which a source test is not performed. NH₃ monitoring shall be conducted utilizing District approved gas-detection tubes or a District approved equivalent method. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last quarter. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4102]*

As previously stated, the engine is also subject to District Rule 4702. Section 5.9 requires monitoring of engine operational characteristics and section 6.5 requires monitoring of NOx and CO missions. These additional monitoring requirements are discussed under the District Rule 4702 compliance section.

3. Recordkeeping

Recordkeeping is required to demonstrate compliance with the offset, public notification and daily emission limit requirements of Rule 2201. The following condition(s) are listed on the permit to operate:

C-9639-1-0

- *Records of hydrogen sulfide analyzer(s) installed or utilized and the calibration records of such analyzer(s) shall be maintained. Records are only required on such analyzer(s) utilized to demonstrate compliance with this permit. [District Rule 2201]*
- *The permittee shall maintain flare operation records including the dates of operation, the purpose of operation, and the daily and annual quantities of digester gas flared, in standard cubic feet (scf). [District Rule 2201]*
- *All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. Records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4311]*

C-9639-2-0 thru '-4-0

- *The inlet temperature of the SCR catalyst and the reagent injection rate shall be monitored and recorded during times in which NOx emissions are being source tested or monitored with a portable analyzer [District Rules 2201 and 4702]*
- *The SCR catalyst shall be maintained and replaced in accordance with the recommendations of the catalyst manufacturer or emission control supplier. Records of catalyst maintenance and replacement shall be maintained. [District Rules 2201 and 4702]*
- *The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: the total hours of operation, the type and quantity of fuel used, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. Quantity of fuel used shall be recorded in standard cubic feet using a non-resettable, totalizing mass or volumetric fuel flow meter or other APCO approved-device. [District Rules 2201 and 4702]*
- *All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. All records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4702]*

4. Reporting

No reporting is required to demonstrate compliance with Rule 2201.

F. Ambient Air Quality Analysis (AAQA)

Section 4.14 of District Rule 2201 requires that an AAQA be conducted for the purpose of determining whether a new or modified stationary source will cause or make worse a violation of an air quality standard. The District's Technical Services Division conducted the required analysis. Refer to **Attachment VI** of this document for the AAQA summary sheet.

The proposed location is in an attainment area for NO_x, CO, and SO_x. As shown by the AAQA summary sheet the proposed equipment will not cause a violation of an air quality standard for NO_x, CO, or SO_x.

The proposed location is in a non-attainment area for the state's PM₁₀ as well as federal and state PM_{2.5} thresholds. As shown by the AAQA summary sheet the proposed equipment will not cause a violation of an air quality standard for PM₁₀ and PM_{2.5}.

Rule 2410 Prevention of Significant Deterioration

As shown in Section VII.C.9 above, this project does not result in a new PSD major source or PSD major modification. No further discussion is required.

Rule 4001 New Source Performance Standards (NSPS)

This rule incorporates NSPS from Part 60, Chapter 1, Title 40, Code of Federal Regulations (CFR) and applies to all new sources of air pollution and modifications of existing sources of air pollution listed in 40 CFR Part 60.

40 CFR Part 60 Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

This rule incorporates NSPS from Part 60, Chapter 1, Title 40, Code of Federal Regulations (CFR) and applies to all new sources of air pollution and modifications of existing sources of air pollution listed in 40 CFR Part 60.

The requirements of 40 CFR Part 60, Subpart JJJJ (*Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*) are applicable stationary engines at agricultural and non-agricultural facilities. The District has not been delegated the authority to implement this NSPS regulation for non-Major Sources.

This facility is neither an existing Major Source nor is becoming a Major Source for any pollutant as a result of this project, therefore provisions of Subpart JJJJ are not applicable to these engines. The 40 CFR Part 60, Subpart JJJJ requirements were placed in error on the permits for these engines under the previous project and will be removed under this project.

Rule 4002 National Emission Standards for Hazardous Air Pollutants

40 CFR 63 Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Emissions (RICE)

The requirements of this subpart are applicable to stationary reciprocating internal combustion engines located at major and area sources of hazardous air pollutant (HAP) emissions. A major source of HAP emissions is a plant that emits or has the potential to emit any single HAP at a rate of 10 tons or more per year or any combination of HAP at a rate of 25 tons or more per year. An area source of HAP emissions is a source that is not a major source.

The District has not been delegated authorization to enforce the requirements of 40 CFR 63 Subpart ZZZZ for non-Part 70 sources (Major Sources).

Rule 4101 Visible Emissions

Rule 4101 states that no air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity.

Since the engines are fired solely on gaseous fuel, visible emissions are not expected to exceed Ringelmann 1 or 20% opacity. The following condition will be listed on the ATCs to ensure compliance:

- *{15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]*

The flare will only be fired on dairy biogas treated to remove sulfur and VOCs when the natural gas pipeline is unavailable. Visible emissions are not expected to exceed Ringelmann 1 or 20% opacity.

Compliance with the rule is expected.

Rule 4102 Nuisance

Rule 4102 prohibits discharge of air contaminants which could cause injury, detriment, nuisance or annoyance to the public. Public nuisance conditions are not expected as a result of these operations; provided the equipment is well maintained. The following permit condition will be

placed on the ATCs to ensure compliance:

- {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102] N

California Health & Safety Code 41700 (Health Risk Assessment)

District Policy APR 1905 – Risk Management Policy for Permitting New and Modified Sources specifies that for an increase in emissions associated with a proposed new source or modification, the District perform an analysis to determine the possible impact to the nearest resident or worksite.

An HRA is not required for a project with a total facility prioritization score of less than one. According to the Technical Services Memo for this project (**Attachment VI**), the total facility prioritization score including this project was greater than one. Therefore, an HRA was required to determine the short-term acute and long-term chronic exposure from this project.

The cancer risk for this project is shown below:

RMR

Units	Prioritization Score	Acute Hazard Index	Chronic Hazard Index	Maximum Individual Cancer Risk	T-BACT Required	Special Permit Requirements
1	0.82	0.01	0.00	5.46E-08	No	Yes
2	31.50	0.10	0.04	6.38E-07	Yes	No
3	31.50	0.10	0.05	6.28E-07	Yes	No
4	31.50	0.10	0.04	6.42E-07	Yes	No
Project Totals	95.40	0.31	0.13	1.96E-06		
Facility Totals	>1	0.31	0.13	1.96E-06		

Proposed Permit Requirements

To ensure that human health risks will not exceed District allowable levels; the following shall be included as requirements for:

Unit # 1-0

- The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction.
- The flare shall be operated only for testing and maintenance, required regulatory purposes, and when gas pipeline is not available. [District Rules 2201 and 4102] N

Operation of the flare for maintenance, testing, and required regulatory purposes shall not exceed 500 hours per calendar year. This requirements is reflected by the following condition:

- *Flaring of digester gas for testing and maintenance, required regulatory purposes, and when gas pipeline is not available shall not exceed either of the following limits: 1,075.2 MMBtu (equivalent to 1.536 MMscf @ 700 Btu/scf) in any one day and 500 hours per calendar year equivalent to 22,400 MMBtu (equivalent to 32.0 MMscf @ 700 Btu/scf). [District Rules 2201 and 4102] N*

Unit # 2, 3, and 4

1. No special requirements.

BACT is required for the IC engines (C-9639-2 through -4) because of emissions of Formaldehyde which is a VOC. TBACT is not triggered for the flare.

Discussion of T-BACT

BACT for toxic emission control (T-BACT) is required if the cancer risk exceeds one in one million. As demonstrated above, T-BACT is required for this project because the HRA indicates that the risk is above the District's thresholds for triggering T-BACT requirements.

For this project T-BACT is triggered for VOC. T-BACT is satisfied with BACT for VOC (see **Attachment V**), which is

Steady State

VOC: 5 ppmvd @15% O2

Commissioning Period – this project

During the commissioning period, the operator shall perform expeditious completion of commissioning activities, and shall use good work practice standards to minimize emissions.

VOC: 159 ppmvd @15% O2

Rule 4201 Particulate Matter Concentration

The purpose of this rule is to protect the ambient air quality by establishing a particulate matter emission standard (grain loading). Section 3.1 prohibits discharge of dust, fumes, or total particulate matter into the atmosphere from any single source operation in excess of 0.1 grain per dry standard cubic foot. The following calculation estimates the grain loading for the proposed engine:

$$0.04 \frac{g}{hp \cdot hr} \times \frac{1hp \cdot hr}{2,545Btu} \times \frac{10^6 Btu}{9,100dscf} \times \frac{0.33Btu_{out}}{1Btu_{in}} \times \frac{15.43grain}{g} = 0.009 \frac{grain}{dscf}$$

Since 0.007 grain/dscf is less than the allowable limit, compliance with this rule is expected.

The following condition will be placed on the ATC to ensure compliance:

- *{14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]*

Rule 4311 Flares

The purpose of this rule is to limit the emissions of volatile organic compounds (VOCs) and oxides of nitrogen (NO_x) from the operation of flares.

Pursuant to Section 4.3, except for the record keeping requirement of Section 6.1.4 the requirements of this rule do not apply to any flare located at a stationary source with potential emissions less than 10.0 tons per year of VOC and 10.0 tons per year of NO_x.

Section 6.1 requires that records shall be maintained, retained on-site for a minimum of five years, and made available to the APCO, ARB, and EPA upon request.

Section 6.1.4 requires an operator claiming exemption under Section 4.3 to record annual throughput, material usage, or other information necessary to demonstrate compliance with the terms of the exemption.

The following conditions will be placed on the permit to ensure compliance with this recordkeeping requirement:

- *The permittee shall maintain records of annual throughput, material usage, or other information necessary to demonstrate that this stationary source (C-9639) has the potential to emit, for all processes, less than ten (10.0) tons per year of VOC and less than ten (10.0) tons per year of NO_x. [District Rule 4311]*
- *All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. Records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4311]*

Please note that Rule 4311 Flares is currently in the rule amendment process. The proposed flare will be subject to Rule 4311. However, the proposed rule amendments to require low NO_x flares in certain cases will likely not apply to the subject flare, as the flare is not used in one of the three targeted industries – oil/gas, landfills, and wastewater treatment plants, that are currently being considered in the rule amendments.

Compliance with the requirements of this rule is expected.

Rule 4701 Stationary Internal Combustion Engines – Phase I

The requirements of Rule 4702 are equivalent or more stringent than the requirements of this Rule. Since the proposed IC engine is subject to both Rules 4701 and 4702, compliance with Rule 4702 is sufficient to demonstrate compliance with this Rule.

Rule 4702 Internal Combustion Engines

The purpose of this rule is to limit the emissions of nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), and sulfur oxides (SO_x) from internal combustion engines.

This rule applies to any internal combustion engine with a rated brake horsepower of 25 brake horsepower or greater.

Section 5.2 Table 2

Table 2 Emission Limits for a Spark-Ignited Internal Combustion Engine Rated at >50 bhp Used Exclusively in Non-AO (All ppmv limits are corrected to 15% oxygen on a dry basis). Emission Limits are effective according to the compliance schedule specified in Section 7.5.			
Engine Type	NO _x Limit (ppmv)	CO Limit (ppmv)	VOC Limit (ppmv)
2. Lean-Burn			
e. Lean-Burn Engine, not listed above	11	2000	750

Applicant has proposed the following emissions: 2 ppmvd NO_x @ 15% O₂, NO_x referenced as NO₂; 9 ppmvd CO @ 15% O₂; and 5 ppmvd VOC @ 15% O₂ during normal operation. [District Rules 2201 and 4702] N

Section 5.3 applies to CEMs. The proposed engines do not have CEMs; therefore, this section is **not applicable**

Sections 5.4 and 5.5 apply to compliance demonstration with percent emissions reductions. The proposed engines are not proposing to meet the NO_x emission limits of Section 5.2 by percent emission reduction; therefore, this section is **not applicable**

Section 5.6 applies to annual fee payment. The proposed engines are not demonstrating compliance by paying an annual fee; therefore, this section is **not applicable**.

Section 5.7 applies to sulfur oxide (SO_x) control requirements. The proposed engines will meet the Section 5.7.2 requirement by operating exclusively on PUC-quality natural gas.

Section 5.8 Monitoring Requirements

Requires the operator with an engine equipped with an external control device to either install, operate, and maintain continuous monitoring equipment (CEMs) for NO_x, CO, and oxygen, as identified in Rule 1080 (Stack Monitoring), or install, operate, and maintain APCO-approved alternate monitoring consisting of one or more of the following:

- Periodic NO_x and CO emission concentrations,
- Engine exhaust oxygen concentration,
- Air-to-fuel ratio,
- Flow rate of reducing agents added to engine exhaust,
- Catalyst inlet and exhaust temperature,
- Catalyst inlet and exhaust oxygen concentration,
- Other operational characteristics.

Since the applicant has selected periodic monitoring of emissions with a portable analyzer, the following conditions are listed on each permit to ensure compliance.

- *During non-commissioning operation, the permittee shall monitor and record the stack concentration of NO_x, CO, and O₂ at least once every calendar quarter (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall be performed not less than once every month for 12 months if 2 consecutive deviations are observed during quarterly monitoring. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month if on a monthly monitoring schedule, or within the last quarter if on a quarterly monitoring schedule. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rule 4702] N*
- *During non-commissioning operation, if either the NO_x or CO concentrations corrected to 15% O₂, as measured by the portable analyzer, exceed the allowable emission concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of performing the notification and testing required by this condition. [District Rule 4702] N*
- *During non-commissioning operation, all alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rule 4702] N*

- *During both commissioning and non-commissioning operation, the permittee shall maintain records of: (1) the date and time of NO_x, CO, and O₂ measurements, (2) the O₂ concentration in percent and the measured NO_x and CO concentrations corrected to 15% O₂, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rule 4702] N*

Section 5.8.2 – requires engines not subject to 5.8.1 to have their operational characteristics monitored as recommended by the engine manufacturer or emission control system supplier, and approved by the APCO. The proposed engines are subject to Section 5.8.1; therefore, Section 5.8.2 is **not applicable**.

Section 5.8.3 For each engine with an alternative monitoring system, submit to, and receive approval from the APCO, adequate verification of the alternative monitoring system's acceptability. This would include data demonstrating the system's accuracy under typical operating conditions for the specific application and any other information or data deemed necessary in assessing the acceptability of the alternative monitoring system. The alternate monitoring proposed is District-approved.

Section 5.8.4 – requires IC engines equipped with CEMS to operate the CEMS in compliance with the requirements of 40 Code of Federal Regulations (CFR) Part 51, 40 CFR Parts 60.7 and 60.13 (except subsection h), 40 CFR Appendix B (Performance Specifications), 40 CFR Appendix F (Quality Assurance Procedures), and applicable provisions of Rule 1080 (Stack Monitoring). The proposed engines in this project are not equipped with CEMS; therefore, Section 5.8.4 is **not applicable**.

Section 5.8.5 – requires that the APCO approve the data gathering and retrieval capabilities of an installed monitoring system. Section 5.8.5 is **not applicable** since the applicant is not using an installed monitoring system on the proposed engines.

Section 5.8.6 – requires the operator to install and operate a nonresettable elapsed operating time meter. In lieu of installing a nonresettable time meter, the owner or operator may use an alternative device, method, or technique in determining operating time provided that the alternative is approved by the APCO and is allowed by Permit-to-Operate or Stationary Equipment Registration condition. The owner of the engine shall properly maintain and operate the time meter or alternative device in accordance with the manufacturer's instructions.

The following condition will be listed on the permits to ensure compliance with Section 5.8.6:

- *{3404} This engine shall be equipped with an operational non-resettable elapsed time meter or other APCO approved alternative. [District Rule 4702]*

Section 5.8.7 requires that for each engine, the permittee implement the Inspection and Monitoring (I&M) plan, if any, submitted to and approved by the APCO pursuant to Section 6.5. The pre-approved alternate emissions monitoring procedure proposed in Section 5.8.1 above will satisfy the requirements of Section 5.8.7. Therefore, compliance with Section 5.8.7 is expected.

- *This engine shall be operated and maintained in proper operating condition per the manufacturer's requirements as specified on the Inspection and Monitoring (I&M) plan submitted to the District. [District Rule 4702]*

Section 5.8.8 requires the operator to collect data through the I&M plan in a form approved by the APCO. By following the pre-approved alternate emissions monitoring procedure proposed in Section 5.8.1 above, the applicant will be collecting data in a form approved by the APCO. Therefore, compliance with Section 5.8.8 is expected

- *The owner/operator shall submit to the APCO for approval, and Inspection and Maintenance (I&M) plan that specifies all actions to be taken to satisfy all of the requirements of Rule 4702 Sections 5.8 and 6.5. [District Rule 4702] Y*
- *The operator shall collect data through the I&M plan in a form approved by the APCO. [District Rule 4702]*

Section 5.8.9 requires that a portable NO_x analyzer be used to take NO_x emission readings to verify compliance with the emission requirements of Section 5.1 during each calendar quarter in which a source test is not performed. The data must be taken and reported as approved by the APCO. This requirement is identified in the alternate monitoring section above and by inclusion of the following ATC condition:

- *During both commissioning and non-commissioning operation, the permittee shall maintain records of: (1) the date and time of NO_x, CO, and O₂ measurements, (2) the O₂ concentration in percent and the measured NO_x and CO concentrations corrected to 15% O₂, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rule 4702] Y*

Section 5.9 lists monitoring requirements for all other engines not subject to the monitoring requirements of Section 5.8. The proposed engines are subject to the monitoring requirements of Section 5.8. Therefore, this section does not apply.

Section 5.10 lists SO_x emissions monitoring requirements for engines that satisfy the SO_x emission control requirements of Section 5.7 by complying with either Sections 5.7.2, 5.7.5, or 5.7.6. The engines will be fired solely on PUC-regulated natural gas, with a known sulfur content limits/requirement; therefore, this section is satisfied and no further discussion is required.

Section 5.11 applies to engines used in AO subject to Permit-Exempt Equipment Registration. The engines are not used in AO. Therefore, this section **does not apply**.

Section 6.1 requires that the operator of an engine to submit to the APCO an emission control plan of all actions to be taken to satisfy the emission requirements of Section 5.2 and the compliance schedules of Section 7.0.

As discussed above, the proposed engines already comply with the emission requirements of Section 5.2 ahead of the compliance schedules of Section 7.0. Therefore, an **emission control plan for these engines is not required**.

Section 6.2.1 requires the operator of an engine subject to the requirements of Section 5.2 of this rule shall maintain an engine operating log to demonstrate compliance with this rule. This information shall be retained for a period of at least five years, shall be readily available, and be made available to the APCO upon request. The engine operating log shall include, on a monthly basis, the following information:

- Total hours of operation,
- Type of fuel used,
- Maintenance or modifications performed,
- Monitoring data,
- Compliance source test results, and
- Any other information necessary to demonstrate compliance with this rule.

The following conditions will be added to the permits to ensure compliance with Section 6.2.1:

- *{3788} The permittee shall maintain records of: (1) the date and time of NO_x, CO, and O₂ measurements, (2) the O₂ concentration in percent and the measured NO_x and CO concentrations corrected to 15% O₂, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rule 4702]*
- *{3797} The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: total hours of operation, type of fuel used, maintenance or modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. [District Rule 4702 and 40 CFR 60, Subpart JJJJ]*

Section 6.2.2 requires that the data collected pursuant to the requirements of Section 5.8 and Section 5.9 shall be maintained for at least five years, shall be readily available, and made available to the APCO upon request. The following condition will be added to the permits ensure compliance:

- *{3498} All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. For units at unstaffed sites or operated remotely, records may be maintained and retained at a District-approved off-site location. [District Rules 2201 and 4702]*

Section 6.2.3 applies to operators claiming an exemption under Section 4.2 or Section 4.3. The proposed engines are not exempt from any requirements under Sections 4.2 or 4.3. Therefore, this section **does not apply**.

Section 6.3 identifies the source testing requirements. Engines retrofitted with exhaust control devices must comply with Sections 6.3.2 through 6.3.4 (source testing frequency, under normal conditions, source test protocol). The following conditions are listed on each permit to ensure compliance.

- *Source testing to measure NO_x, CO, VOC, and ammonia (NH₃) emissions from this unit shall be conducted within 60 days of startup and at least once every 24 months of operation thereafter. [District Rules 1081, 2201, and 4702] N*
- *{3791} Emissions source testing shall be conducted with the engine operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. [District Rule 4702] N*
- *For emissions source testing, the arithmetic average of three 60-consecutive-minute test runs shall apply. Each test run shall be conducted within 10 percent of 100 percent peak (or the highest achievable) load. If two of three runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. VOC emissions shall be reported as both methane and propane. NO_x, CO, VOC, and NH₃ concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702] N*

Section 6.3.5 states that engines that are limited to be fueled exclusively with PUC quality natural gas shall not be subject to the reoccurring source test requirement of Section 6.3.2 for VOC emissions. However, the reoccurring source testing is required pursuant to District Policy ARP-1705, since the VOC limit is not from Rule 4702 but from BACT.

Section 6.3.6 (representative source testing) allows for representative source testing from an engine or engines that represents a specified group of engines, provided the necessary requirements are met. The following conditions will be listed on the permits to ensure compliance:

- *Compliance with the applicable emission limits of NO_x, CO, and VOC shall be demonstrated by submittal of annual emission test results, within 30 days of the test date, to the District, from a unit or units that represents a specified group of units, provided all of the following are requirements are satisfied: The units are located at the same stationary source; the units were produced by the same manufacturer, have the same model number or other manufacturer's designation in common, and have the same rated capacity and operating specifications; the units are operated and maintained in a similar manner; and at least 20% of the total number of units are tested during each annual test cycle. [District Rule 4702]*
- *If any of the representative units exceed the required emission limits, or if the District notifies the operator that the criteria in Sections 6.3.6.1 through 6.3.6.5 have not been fulfilled, each of the units in the group shall individually demonstrate compliance by emissions testing. Failure to complete emissions testing within 90 days of the failed test shall result in the untested units being in violation of this rule. After compliance with the requirements of Section 6.3.6.6 has been demonstrated, subsequent source testing shall be performed pursuant to Sections 6.3.2 or 6.3.6. [District Rule 4702]*

Section 6.4 requires that the compliance with the requirements of Section 5.2 shall be determined in accordance with the following test procedures or any other method approved by EPA and the APCO:

- Oxides of nitrogen - EPA Method 7E, or ARB Method 100.
- Carbon monoxide - EPA Method 10, or ARB Method 100.
- Stack gas oxygen - EPA Method 3 or 3A, or ARB Method 100.
- Volatile organic compounds - EPA Method 25A or 25B, or ARB Method 100. Methane and ethane, which are exempt compounds, shall be excluded from the result of the test.
- Operating horsepower determination - any method approved by EPA and the APCO.
- Oxides of sulfur – EPA Method 6C or 8, or ARB Method 100.

The following conditions are listed on each permit to ensure compliance.

- *The following methods shall be used for official source testing: NO_x (ppmv) - EPA Method 7E, CO (ppmv) - EPA Method 10, VOC (ppmv) - EPA Method 25A or 25B, stack gas oxygen - EPA Method 3 or 3A. Alternative test methods as approved by EPA, ARB, and the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702 and 40 CFR 60, Subpart JJJJ]*
- *{109} Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081]*
- *The results of each source test shall be submitted to the District and EPA within 60 days after completion of the source test. [District Rule 1081 and 40 CFR 60, Subpart JJJJ]*

Section 6.5 requires that the operator of an engine subject to the requirements of Section 5.2 or the requirements of Section 8.0 shall submit to the APCO for approval an I&M plan that specifies all actions to be taken to satisfy the following requirements and the requirements of Section 5.8. The actions to be identified in the I&M plan shall include, but are not limited to, the following requirements listed in Sections 6.5.2 through 6.5.9. If there is no change to the previously approved I&M plan, the operator shall submit a letter to the District indicating that previously approved plan is still valid.

Section 6.5.1 states the requirements of Section 6.5.2 through 6.5.9 shall apply to the following engines:

- Engines that have been retrofitted with an exhaust control device, except those certified per Section 9.0;
- Engines subject to Section 8.0;
- An AO spark-ignited engine that is subject to the requirements of Section 8.0;
- An AO spark-ignited engine that has been retrofitted with a catalytic emission control and is not subject to the requirements of Section 8.0.

The proposed engines have an exhaust control device. Therefore, Sections 6.5.2 through 6.5.9 apply.

Section 6.5.2 requires procedures for establishing ranges for control equipment parameters, engine operating parameters, and engine exhaust oxygen concentrations that source testing has shown result in pollutant concentrations within the rule limits.

Section 6.5.3 requires procedures for monthly inspections as approved by the APCO. The applicable control equipment parameters and engine operating parameters will be inspected and monitored weekly (proposed by the applicant) in conformance with a regular inspection schedule listed in the I&M plan. Such weekly inspection and monitoring of the control equipment and engine operating parameters will be accompanied by quarterly emissions monitoring as specified in the approved alternate monitoring plan.

Section 6.5.4 requires procedures for the corrective actions on the noncompliant parameter(s) that the owner or operator will take when an engine is found to be operating outside the acceptable range for control equipment parameters, engine operating parameters, and engine exhaust NO_x, CO, VOC, or oxygen concentrations.

Section 6.5.5 requires procedures for the owner or operator to notify the APCO when an engine is found to be operating outside the acceptable range for control equipment parameters, engine operating parameters, and engine exhaust NO_x, CO, VOC, or oxygen concentrations.

The alternate monitoring scheme proposed in Section 5.8.1 above will satisfy the requirements of Sections 6.5.2, 6.5.3, 6.5.4 and 6.5.5 of the rule. Therefore, compliance with Sections 6.5.2, 6.5.3, 6.5.4, and 6.5.5 is expected.

Section 6.5.6 requires procedures for preventive and corrective maintenance performed for the purpose of maintaining an engine in proper operating condition. The alternate monitoring procedure proposed in Section 5.6.1 above will satisfy the requirements of Section 6.5.6. Moreover, the applicant will operate and maintain engine according to the manufacturer's specifications:

- *This engine shall be operated and maintained in proper operating condition per the manufacturer's requirements as specified on the Inspection and Monitoring (I&M) plan submitted to the District. [District Rule 4702]*

Section 6.5.7 requires procedures and a schedule for using a portable NO_x analyzer to take NO_x emission readings pursuant to Section 5.6.9. The alternate monitoring procedure proposed in Section 5.6.1 above will ensure compliance with the requirements of Section 6.5.7.

Section 6.5.8 requires procedures for collecting and recording required data and other information in a form approved by the APCO including, but not limited to, data collected through the I&M plan and the monitoring systems described in Sections 5.6.1 and 5.6.2. Data collected through the I&M plan shall have retrieval capabilities as approved by the APCO.

The data collection and recordkeeping requirement described in Section 6.2.1 above will satisfy the requirements of Section 6.5.8.

Section 6.5.9 specifies procedures for revising the I&M plan. The owner of an engine may request a change to the I&M plan at any time. The I&M plan shall be updated to reflect any change in operation and prior to any planned change in operation. An engine owner that changes significant I&M plan elements must notify the District no later than seven days after the change and must submit an updated I&M plan to the APCO no later than 14 days after the

change for approval. The date and time of the change to the I&M plan shall be recorded in the engine operating log. For new engines and modifications to existing engines, the I&M plan shall be submitted to and approved by the APCO prior to issuance of the Permit-to-Operate. Therefore, the following condition will be listed on the ATC to ensure compliance with Section 6.5.9:

- *The owner/operator shall submit to the APCO for approval, and Inspection and Maintenance (I&M) plan that specifies all actions to be taken to satisfy all of the requirements of Rule 4702 Sections 5.8 and 6.5. [District Rule 4702]*
- *{3212} The permittee shall update the I&M plan for this engine prior to any planned change in operation. The permittee must notify the District no later than seven days after changing the I&M plan and must submit an updated I&M plan to the APCO for approval no later than 14 days after the change. The date and time of the change to the I&M plan shall be recorded in the engine's operating log. For modifications, the revised I&M plan shall be submitted to and approved by the APCO prior to issuance of the Permit to Operate. The permittee may request a change to the I&M plan at any time. [District Rule 4702]*

Section 8.0 allows an operator to comply with the NO_x emission requirements of Section 5.2 for a group of engines by aggregating their NO_x emissions.

The facility has not requested to comply with an Alternative Emission Control Plan in lieu of the requirements of Section 5.2. Therefore, this section will not be addressed.

Conclusion

As discussed in the preceding sections, the proposed engine is expected to be in compliance with this rule.

Rule 4801 Sulfur Compounds

Rule 4801 requires that sulfur compound emissions (as SO₂) shall not exceed 0.2% by volume (2,000 ppmv). The sulfur content of the digester gas used as fuel in this engine is limited to 40 ppmv as H₂S. The flare will combust gas with a sulfur content not exceeding 1 gr S/100 scf.

Compliance is expected.

California Environmental Quality Act (CEQA)

CEQA requires each public agency to adopt objectives, criteria, and specific procedures consistent with CEQA Statutes and the CEQA Guidelines for administering its responsibilities under CEQA, including the orderly evaluation of projects and preparation of environmental documents. The District adopted its *Environmental Review Guidelines* (ERG) in 2001. The basic purposes of CEQA are to:

- Inform governmental decision-makers and the public about the potential, significant environmental effects of proposed activities;

- Identify the ways that environmental damage can be avoided or significantly reduced;
- Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible; and
- Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

Greenhouse Gas (GHG) Significance Determination

It is determined that another agency has prepared an environmental review document for the project. The District is a Responsible Agency for the project because of its discretionary approval power over the project via its Permits Rule (Rule 2010) and New Source Review Rule (Rule 2201), (CEQA Guidelines §15381). As a Responsible Agency, the District is limited to mitigating or avoiding impacts for which it has statutory authority. The District does not have statutory authority for regulating greenhouse gas emissions. The District has determined that the applicant is responsible for implementing greenhouse gas mitigation measures, if any, imposed by the Lead Agency.

District CEQA Findings

The County of Madera (County) is the public agency having principal responsibility for approving the Conditional Use Permit 2016-008, which covers this Project. As such, the County served as the Lead Agency (CCR §15367). In approving the project, the Lead Agency prepared and adopted a Mitigated Negative Declaration. The Lead agency filed a Notice of Determination, stating that the environmental document was adopted pursuant to the provisions of CEQA and concluding that the project would not have a significant effect on the environment.

The District is a Responsible Agency for the project because of its discretionary approval power over the project via its Permits Rule (Rule 2010) and New Source Review Rule (Rule 2201), (CCR §15381). As a Responsible Agency the District complies with CEQA by considering the environmental document prepared by the Lead Agency, and by reaching its own conclusion on whether and how to approve the project (CCR §15096).

The District has considered the Lead Agency's environmental document. Furthermore, the District has conducted an engineering evaluation of the project, this document, which demonstrates that Stationary Source emissions from the project would be below the District's thresholds of significance for criteria pollutants. Thus, the District finds that through a combination of project design elements, compliance with applicable District rules and regulations, and compliance with District air permit conditions, project specific stationary source emissions will have a less than significant impact on air quality. The District does not have authority over any of the other project impacts and has, therefore, determined that no additional findings are required (CEQA Guidelines §15096(h)).

Indemnification Agreement/Letter of Credit Determination

According to District Policy APR 2010 (CEQA Implementation Policy), when the District is the Lead or Responsible Agency for CEQA purposes, an indemnification agreement

and/or a letter of credit may be required. The decision to require an indemnity agreement and/or a letter of credit is based on a case-by-case analysis of a particular project's potential for litigation risk, which in turn may be based on a project's potential to generate public concern, its potential for significant impacts, and the project proponent's ability to pay for the costs of litigation without a letter of credit, among other factors.

The criteria pollutant emissions and toxic air contaminant emissions associated with the proposed project are not significant. Therefore, an Indemnification Agreement and/or a Letter of Credit will not be required for this project in the absence of expressed public concern.

IX. Recommendation

Compliance with all applicable rules and regulations is expected. Issue ATCs C-9639-1-0 through '4-0 subject to the permit conditions on the attached draft ATCs in **Attachment VII**.

X. Billing Information

Annual Permit Fees			
Permit Number	Fee Schedule	Fee Description	Annual Fee
C-9639-1-0	3020-06	Miscellaneous	\$ 128.00
C-9639-2 thru '4	3020-10-F	2,146 hp IC engine	\$ 900.00

Attachments

- I: IC Engine Manufacturer Details
- II: Emissions Factors
- III: Emissions Profile
- IV: BACT Guideline
- V: BACT Analysis
- VI: Health Risk Assessment Results
- VII: Draft ATC

ATTACHMENT I
IC ENGINE MANUFACTURER DETAILS



Johnson Matthey
Inspiring science, enhancing life

Johnson Matthey SEC LLC
900 Forge Avenue
Suite 100
Audubon, PA 19403
T 484-320-2136

SCR-CO-ASC Systems for 3 x 16V4000GS MTU

Natural Gas Generators

Collicutt Energy

Proposal Submitted
By

Johnson Matthey
Inspiring science, enhancing life

Stationary Emissions Control LLC
17011 Beach Blvd., Suite 520
Huntington Beach, CA 92647

Johnson Matthey Proposal No. 400-19-103

August 26, 2019



1. DESIGN PARAMETERS

The following conditions were used to design the SCR-CO-ASC system for each engine.

Table 1. Full Load Design Parameters

Engine BHP Rating	2,146 HP
Engine	MTU 16V4000GS
Application	Power Generation
No. of Units	3
Operating Hours per Year	8,000 est.
Fuel	Natural Pipeline Gas
Exhaust Gas Flow Rate	19,590 lb/hr wet
Exhaust Gas Temperature	817°F (1)
Design Exhaust Oxygen Concentration	9.9 % (assumed)
Design Moisture Concentration	10 % (assumed)

(1) The urea injection permissive is 600°F and the high temperature alarm is 925°F, with a maximum allowable of 950°F, reaching the catalyst.

Table 2. Full Load Emissions Data

Exhaust Component	Catalyst Inlet	Catalyst Outlet	Catalyst Outlet	Required Reduction
NO_x	0.5 g/bhp-hr	0.02 g/bhp-hr	0.07 lbs./MW-hr.	~96%
CO	2.5 g/bhp-hr	0.07 g/bhp-hr	0.20 lbs./MW-hr.	~97%
Unsaturated VOC (Typically NMNEHC)	0.7 g/bhp-hr	0.02 g/bhp-hr	< 2.0 lbs./day/engine	~97%

Table 3. Full Load SCR System Data per SCR

Max. Ammonia Slip	10 ppmvd @ 15% O ₂
Estimated 32.5% Urea Usage	0.7 USGPH
Estimated Maximum System Pressure Loss	≤15 "w.c.

NOTES:

Johnson Matthey has calculated the appropriate catalyst volume and necessary equipment to achieve the stated emission reductions based on the above Design Parameters. If the actual operating conditions are different from above conditions more catalyst and/or different equipment may be required for the system to achieve the required emission reductions. For this reason, all operating conditions must be closely reviewed and confirmed because different Parameters will void the warranty.



2. EQUIPMENT DESCRIPTION PER SCR SYSTEM PER ENGINE

The equipment outlined below will be supplied for the SCR-CO-ASC system:

2.1 General Arrangement

Johnson Matthey's SCR systems are designed, manufactured and inspected in accordance with our strict in-house procedures and standards, which may or may not comply with specifications that are provided by Others. Unless otherwise stated, our SCR design reflects a "straight through" configuration as shown on Johnson Matthey drawing 503731. Modifying the design to accommodate a different system footprint may require a change to the price and/or shipment schedule due to the possible need to incorporate additional ducting, elbows, turning vanes, flanges, etc.

2.2 One (1) SCR-ASC Housing (SCR-ASC 6x6) with One (1) Oxidation Housing (W90Q)

The SCR catalyst housing and catalyst tracks are fabricated from 400 series stainless steel. The housing is complete with a hinged catalyst access door, lifting lugs and misc. instrument connections. The floating catalyst tracks provide a labyrinth seal to prevent gas from by-passing the catalyst while minimizing the use for gaskets. Such gaskets tend to crack after thermal expansion and contraction cycles, and these cracks enable gas to by-pass the catalyst, which reduces the overall system performance. 24" 150# pattern flange connections are provided.

Please refer to drawing 503731 for preliminary dimensions of SCR Housing and Mixing Duct.

The Oxidation catalyst housing is our Modulex 90Q fabricated in Carbon Steel. This housing is located upstream of the Mixing Duct and provides the CO and VOC reduction requirements with three layers of Oxidation Catalyst inside this housing and a spare slot for a fourth layer of Oxidation Catalyst.. 24" 150# pattern flange connections are provided. Upstream and downstream sample ports are provided.

Please refer to drawing for preliminary dimensions for this Modulex W90 housing.

2.3 One (1) Lot SCR, Oxidation Catalyst and Ammonia Slip Catalyst

The SCR-CO-ASC system will be provided with three catalyst types (Oxidation, SCR and Ammonia Slip Catalyst (ASC)) and volume that is needed to achieve the emission reductions which are listed above. The oxidation catalyst is housed in the Modulex unit, the SCR and ASC catalyst is housed in the SCR-ASC reactor Johnson Matthey designs and manufactures our own catalyst, and has been doing so for decades. We integrate the proven performance of our catalyst into every SCR system that we provide. The catalyst is supplied in modules or blocks of sufficient size and weight to facilitate handling for loading the catalyst into the catalyst housing.

2.4 One (1) Mixing Duct and One (1) Expansion Joint

The 24" diameter x 8' long mixing duct is optimized for the injection, atomization and mixing of the reductant into the engine exhaust gas. The duct itself is fabricated from 300 series stainless steel and mixing duct internals are also fabricated from 300 series stainless steel. The duct is supplied with internal mixers and all necessary fittings for the installation of the supplied urea injection lance. Also included, is a 24" diameter x 18" long SSTL Expansion Joint with Carbon Steel isolated flanges.



2.5 One (1) Urea Injection Control System

This system can utilize a feedforward control loop from a NOx sensor, pitot tube with differential pressure measurement that are located upstream of the catalyst to control the urea injection rate. The base price does not include this feedforward feature, but the option for this feature is provided in the pricing section. In addition, the urea injection parameters will be mapped to the engine load (4-20mA signal provided by Purchaser) in the SCR system's PLC during commissioning.

The primary components of the urea injection control system are:

Control Panel – Painted carbon steel enclosure containing a touch screen Allen Bradley PLC with HMI and Modbus IP communication, on-off switch, on-off status indicator light, and data logger. Touch screen can be used for system commissioning and setup. System includes remote access capability for off-site monitoring. The control panel is mounted to the dosing panel that is described below. Both panels are designed for indoor installations. Please refer to drawing 505493 for approximate overall dimensions of the panel.

Urea Dosing Panel – Attached to the control panel that is described above and contains the positive displacement urea metering pump (requires flooded suction), system purge valve, air regulator, air pressure switch, check valves, overpressure regulator, 3-way injection valve and leak detector.

Urea Injection Lance - Specially designed 2-phase 300 series stainless steel lance/nozzle assembly with high temperature protection.

Exhaust Gas Temperature Transmitter - RTD to allow urea system to start injecting at temperatures greater than 600°F.

2.6 Documentation Operation and Maintenance Manuals

Included are an electronic General Arrangement Approval Drawing, plus Certified Drawings of the P&ID and the control/dosing panel general arrangement drawings and wiring schematic. Also included is an electronic Operation and Maintenance Manual for the SCR system. The general arrangement stp. files are available upon request.

2.7 Commissioning and Technical Services

Commissioning for the SCR systems is offered as a separate price based on our per diem rate plus expenses. The estimated duration for this service is three (3) weekdays working eight (8) hours per day. Please refer to Appendix A for the per diem rates and details regarding site services.

In addition to commissioning, our service engineers are available for technical support and annual maintenance.

In addition to site services, Johnson Matthey's in-house catalyst development laboratory is equipped with various catalyst testing apparatus which can analytically evaluate core samples from in-service catalyst to determine the catalyst's activity level and potential contaminants.



3. PURCHASER REQUIREMENTS

Johnson Matthey requires the Purchaser to provide the following in order for the system to operate:

- a) **Power supply for SCR control panel** - 120VAC, 1 phase, 60 Hz, 5 FLA.
- b) **Air supply for SCR system** - The system requires approximately 8 cfm of clean, dry air at a minimum pressure of 80 psig. Johnson Matthey can supply an air compressor if required.
- c) **Load signal** - A 4-20 mA signal from the engine relative to load is used for secondary urea injection control.
- d) **Call signal** - A dry contact from the engine indicating it has been started.
- e) **Equipment Layout** - Johnson Matthey would like the opportunity to comment on the layout of the plant prior to the start of fabrication to make sure our equipment is being utilized properly.

4. EXCLUSIONS

The following items are not included in the Johnson Matthey scope of supply:

- All utilities; including electricity, compressed air and ISO quality urea
- All interconnecting piping and electrical cable
- External insulation for air or urea lines
- Mounting hardware including mating flanges, gaskets, nuts, bolts and washers
- Ethernet connection through the internet for remote monitoring
- Expansion Joints (other than the one 24" diameter expansion joint that is included)
- Support steel, Foundations
- Seismic calculations, certificates or stamps
- Drainage
- Mechanical Installation and/or Electrical Installation
- Commissioning
- Duct from engine outlet to Modulex, including other needed expansion joints
- Duct from SCR housing outlet to end of exhaust system including other expansion joints
- Load bank for commissioning
- Third Party Testing
- Shipping and sales/use taxes (if applicable)
- Any product or service not specifically described in this budgetary proposal



Johnson Matthey
Inspiring science, enhancing life

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6. ABOUT JOHNSON MATTHEY

Johnson Matthey Stationary Emission Control provides catalytic emission control technologies for coal fired power plants, gas turbines, stationary engines, thermal oxidizers and industrial processes. We've manufactured millions of cubic feet of catalyst that is utilized around the world for reducing NOx, CO, VOC, HAPs and PM emissions. Our North American headquarters and manufacturing plants are located in Pennsylvania, and we have engineering and sales offices in both Georgia and California.

For stationary engines, we design, build and service catalytic emission solutions for a variety of engines, fuels and applications. Our SCR systems are used on 2 and 4-stroke, low, medium and high speed engines in pumping stations, greenhouses, data centers, drill rigs and prime power generation with fuels that range from diesel, HFO, natural gas and propane to a variety of digester gases such as landfill, waste water treatment, dairy farm and food waste. To date we've supplied over 400 SCR systems for stationary engines with over 3 GW of installed power on engines ranging from 250 KW to 29 MW.

Our parent company, Johnson Matthey Plc is a London-based FTSE 100 company (JMAT) with 13,000 employees, 14 manufacturing plants, 8 technology centers, and sales and service centers in 30 countries that support customers all over the globe. Johnson Matthey was founded in 1817 and just celebrated its 200th anniversary. We are a global leader in science that enables a cleaner and healthier world. Our sustained commitment to innovation lead to technological breakthroughs that improve the function, performance and safety of our customers' products. Our science has a global impact in areas such as low emission transport, pharmaceuticals, chemical processing and making the most efficient use of the planet's natural resources.

ATTACHMENT II
IC ENGINE EMISSIONS FACTORS

Jonah Aiyabei

From: Mark Terry <mark@bioremenergy.com>
Sent: Monday, December 2, 2019 4:03 PM
To: Jonah Aiyabei
Subject: [SPAM-Keyword] - Re: Biorem Energy, LLC / Facility Number: C-9639 / Project Number: C-1193125
Attachments: ATT00001.htm; ATT00002.htm; ATT00003.htm; 02_Red Top_Site Lease_Land Estoppel.pdf; ATT00004.htm; ATT00005.htm

Hi Jonah.

I spoke to David Mueller, and he said he had already provided this information earlier to the SJVAPCD, so it is possible someone else on your staff already has this information in another file. In the event the information was misplaced or MTU was mistaken, I have copied the responses from MTU in the body of the email. The Land Estoppel is also attached.

Thanks again and please don't hesitate to call or email with any questions that may arise.

MTU EMAIL RESPONSES:

Hi Mark:

Here is our response to the questions from Jonah at Valley Air. They include comments from Bob Bono our resource at Johnson Matthey, the company providing the SCR equipment, and the Service Operations Manager – Technical Gas Systems from MTU.

1) Copy of lease agreement or similar document indicating approval by Redtop Jerseys for Biorem to install/operate equipment at Redtop Jerseys property.

You have this covered.

2) Emissions monitoring plan for the engines as requested on the supplemental application form. If no other plan is proposed, please confirm that it would be acceptable for us to apply the standard option, which is **periodic monitoring of NOx, CO, and O2 concentrations using a portable analyzer.**

We recommend going with the standard option. We included a portable analyzer in the quote we submitted to you earlier.

3) Inspection & Monitoring plan (per section 6.5 of District Rule 4702, http://www.valleyair.org/rules/currnrules/R4702_Clean.pdf) to demonstrate that the engines will operate in compliance with proposed emission limits. If not submitting a detailed plan, please confirm that it would be acceptable for us to apply the following typical options for engines with SCR and oxidation catalysts:

- To ensure that NOx emissions concentrations are not being exceeded between periodic NOx portable analyzer measurements, **determine a correlation between the SCR system's reagent injection rate and the catalyst control system inlet exhaust temperature and NOx emissions.** The appropriate ranges for each operating load will be established during performance testing and will be monitored at least once per month.

On the NOx, the urea map we establish vs load is good to monitor vs the injection rate being applied at various loads. This is data that can be captured and reviewed each month (i.e. what injection rates of urea were applied for various loads run).

- To ensure that CO and VOC emissions concentrations are not being exceeded between periodic CO emissions concentration measurements, **determine a correlation between the catalyst control system inlet exhaust temperature and back pressure and CO emissions**. The appropriate ranges for each operating load will be established during performance testing and will be monitored at least once per month.

On the CO and VOC . . . a CO test using the portable analyzer is common and easy enough to perform once a month. In between, the record of exhaust temperature should be sufficient to assure the CO reduction is sufficient. In regards to VOC . . . the CO test should be suggested as the marker for VOC (i.e. an acceptable CO reduction is also an acceptable VOC reduction even though a direct VOC test isn't performed, but a direct CO reduction is performed).

4) Please also indicate whether the proposed engines will require a commissioning period or not. If a commissioning period will be require, please indicate how long (total number of days, and maximum number of hours each day), and what the worst-case emission rates will be (i.e. when engine is operated without controls).

Standard commissioning for a series 4000 is 10 days at 8 hours per day (weekends are non-workdays) for each unit as long as the pre-checklist has been completed and there are no issues with 3rd party supplier items. A total of 30 working days would be needed to complete all 3 units.

Worst case emissions identified on the engine technical data sheet:

NOx (stated as NO2 (dry))	g/bhp-hr	1.0
CO (dry)	g/bhp-hr	3.0
VOC (dry)	g/bhp-hr	0.7

Let us know what else you need.

Best regards,

David

David Muller
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www.mtuonsiteenergy.com



Grams/Brake Horsepower - Hour → Parts Per Million Volume

g/Bhp-hr → ppmv

Variables:

Engine Size:	2146	hp
NO _x :	1	g/bhp-hr
CO:	3	g/bhp-hr
VOC:	0.7	g/bhp-hr
O ₂ level:	15	%
Engine Efficiency:	35	% (Assumed)
F-factor:	9100	dsct/MMBtu
Fuel Type	1	
OIL (CRUDE, RESIDUAL, OR DISTILLATE)		0
GAS (NATURAL)		1
GAS (PROPANE)		2
GAS (BUTANE)		3

Given:

Conversion #1	379.5	dsct/lb-mole
Conversion #2	393.236	bhp-hr/MMBtu
Conversion #3	453.59	g/lb
MW _{no_x} :	46	as NO ₂
MW _{co₂} :	28	
MW _{voc₂} :	16	as CH ₄
O ₂ Correction:	3.542	
Pressure (p)	1	atm
Temp (oF)	60	oF

Formula:

g	1	1	(20.9 - O ₂ %)	Conversion #1	Conversion #2	1	Engine Eff.
bhp-hr	F-factor	MW _{pollutant}	20.9	1	1	Conversion #3	1

for NO_x:

$$\begin{array}{cccccccc} \rightarrow & 1.00 \text{ g} & \text{MMBtu} & \text{lb-mol} & 20.9 - 15 & 379.5 \text{ dsct} & \text{bhp-hr} & \text{lb} & 35\% \\ & \text{bhp-hr} & 9100 \text{ dsct} & 46 \text{ lb} & 20.9 & \text{lb-mol} & \text{MMBtu} & 453.59 \text{ g} & 1 \end{array} = 78.844 \text{ PPM}$$

for CO:

$$\begin{array}{cccccccc} \rightarrow & 3.00 \text{ g} & \text{MMBtu} & \text{lb-mol} & 20.9 - 15 & 379.5 \text{ dsct} & \text{bhp-hr} & \text{lb} & 35\% \\ & \text{bhp-hr} & 9100 \text{ dsct} & 28 \text{ lb} & 20.9 & \text{lb-mol} & \text{MMBtu} & 453.59 \text{ g} & 1 \end{array} = 388.588 \text{ PPM}$$

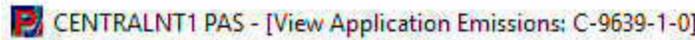
for VOC:

$$\begin{array}{cccccccc} \rightarrow & 0.70 \text{ g} & \text{MMBtu} & \text{lb-mol} & 20.9 - 15 & 379.5 \text{ dsct} & \text{bhp-hr} & \text{lb} & 35\% \\ & \text{bhp-hr} & 9100 \text{ dsct} & 16 \text{ lb} & 20.9 & \text{lb-mol} & \text{MMBtu} & 453.59 \text{ g} & 1 \end{array} = 158.674 \text{ PPM}$$

Grams/Brake Horsepower - Hour ----> Parts Per Million Volume									
g/Bhp-hr ----> ppmv									
Variables:									
Engine Size:	2146 hp								
NO _x :	0.02 g/bhp-hr								
CO:	0.07 g/bhp-hr								
VOC:	0.02 g/bhp-hr								
O ₂ level:	15 %								
Engine Efficiency:	35 % (Assumed)								
F-factor:	9100 dscf/MMBtu								
Fuel Type	1								
OIL (CRUDE, RESIDUAL, OR DISTILLATE)	0								
GAS (NATURAL)	1								
GAS (PROPANE)	2								
GAS (BUTANE)	3								
Given:									
Conversion #1	379.5 dscf/lb-mole								
Conversion #2	393.236 bhp-hr/MMBtu								
Conversion #3	453.59 g/lb								
MW _(NO_x)	46 as NO _x								
MW _(CO)	28								
MW _(VOC)	16 as CH ₄								
O ₂ Correction:	3.542								
Pressure (p)	1 atm								
Temp (oF)	60 oF								
Formula:									
g	1	1	(20.9 - O ₂ %)	Conversion #1	Conversion #2	1	Engine Eff.	-	
bhp-hr	F-factor	MW _(pollutant)	20.9	1	1	Conversion #3	1	-	
for NO_x:									
⇒	0.02 g	MMBtu	lb-mol	20.9 - 15	379.5 dscf	***** bhp-hr	lb	35%	-
	bhp-hr	9100 dscf	46 lb	20.9	lb-mol	MMBtu	453.59 g	1	-
				=	1.577	PPM			
for CO:									
⇒	0.07 g	MMBtu	lb-mol	20.9 - 15	379.5 dscf	***** bhp-hr	lb	35%	-
	bhp-hr	9100 dscf	28 lb	20.9	lb-mol	MMBtu	453.59 g	1	-
				=	9.067	PPM			
for VOC:									
⇒	0.02 g	MMBtu	lb-mol	20.9 - 15	379.5 dscf	***** bhp-hr	lb	35%	-
	bhp-hr	9100 dscf	16 lb	20.9	lb-mol	MMBtu	453.59 g	1	-
				=	4.534	PPM			

ATTACHMENT III Emissions Profile

C-9639-1-0



File Actions Window

Permit #: C 9639-1 -0 Facility: BIOREM ENERGY, LLC	Issued: // Implemented: //
--	-------------------------------

Last Updated: 08/18/20 EDGEHILR	<input type="checkbox"/> Use PTO emissions Equipment Prebaselined: <input type="checkbox"/> Yes <input type="checkbox"/> No
---------------------------------------	--

	NOX	SOX	PM10	CO	VOC
PM2.5/PM10 %					
PM2.5 (lb/Yr)					
Potential to Emit (lb/Yr):	1344	46	336	1030	134
Daily Emis. Limit (lb/Day):	64.5	2.2	16.1	49.5	6.5
Quarterly Net Emissions Change (lb/Qtr)					
1:	336	11	84	257	33
2:	336	11	84	257	33
3:	336	12	84	258	34
4:	336	12	84	258	34
Check if offsets are triggered but exemption applies	<input type="checkbox"/>				
Offset Ratio:					
Quarterly Offset Amounts (lb/Qtr)					
1:					
2:					
3:					
4:					
SLC ID (PTE):					
SLC ID (DEL):					

Facility SLC
Exit

C-9639-2 thru '-4

CENTRALNT1 PAS - [View Application Emissions: C-9639-2-0]

File Actions Window

Permit #: C 9639-2 -0	Issued: //	Last Updated: 01/10/20	
	Implemented: //	EDGEHILR	
Facility: BIOREM ENERGY, LLC		<input type="checkbox"/> Use PTO emissions	Equipment Prebaselined: <input type="checkbox"/> Yes <input type="checkbox"/> No

PM2.5/PM10 %		NOX	SOX	PM10	CO	VOC
PM2.5 (lb/Yr)						
Potential to Emit (lb/Yr):		1153	389	1368	3872	1054
Daily Emis. Limit (lb/Day):		34.7	1.1	3.8	105.0	24.8
Quarterly Net Emissions Change (lb/Qtr)	1:	288	97	342	968	263
	2:	288	97	342	968	263
	3:	288	97	342	968	264
	4:	289	98	342	968	264
Check if offsets are triggered but exemption applies		<input type="checkbox"/>				
Offset Ratio:						
Quarterly Offset Amounts (lb/Qtr)	1:					
	2:					
	3:					
	4:					
SLC ID (PTE):						
SLC ID (DEL):						

Facility SLC

Exit

ATTACHMENT IV
BACT Guideline

San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 5.8.12*

Last Update: 8/2/2018

Dairy Manure Digester with Backup/Emergency Flare

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Open flare (98% control efficiency)	Ultra-low emissions (ULE) enclosed flare (99% control efficiency)	

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a State Implementation Plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

***This is a Summary Page for this Class of Source**

ATTACHMENT V
BACT Analysis

C-9639-1-0

BACT Analysis for VOC Emissions

a. Step 1 - Identify all control technologies

The following options were identified from Guideline 5.8.12:

- 1) Open flare (98% Control Efficiency) – Achieved in Practice
- 2) ULE Enclosed flare (99% Control Efficiency) – Technologically Feasible
15 ppmv @ 3% O₂ NO_x

b. Step 2 - Eliminate technologically infeasible options

There are no technologically infeasible options to eliminate from step 1.

c. Step 3 - Rank remaining options by control effectiveness

- 1) ULE Enclosed flare (99% Control Efficiency) – Technologically Feasible
15 ppmv @ 3% O₂ NO_x
- 2) Open flare (98% Control Efficiency) – Achieved in Practice

d. Step 4 - Cost Effectiveness Analysis

Option 1: ULE Enclosed Flare (99% Control Efficiency)

The capital cost for two new recently proposed 53.2 MMBtu/hr John Zink ZULE flares at the Fresno/Clovis Wastewater Treatment Plant (WWTP) including new electrical and control building, site work, piping to integrate into existing system, programming, etc. is \$2,518,000 (please see table below). These costs will be used in the cost effectiveness analysis below.

The estimated annual operating cost is approximately \$30,000 which includes power costs for a digester gas blower (40 HP) and combustion air blower (125 HP).

Using the 6/10ths rule the estimated cost for a 44.8 MMBtu/hr flare is

$$\$2,518,000 \times (44.8/53.2)^{0.6} = \$2,271,306$$

The equivalent annual cost is calculated as shown below:

$$A = P \frac{i(1+i)^n}{(1+i)^n - 1} \quad \text{where:}$$

$(1+i)^n - 1$
A = equivalent annual control equipment capital cost

P = present value of the control equipment, including installation cost

i = interest rate (generally assumed to be 10%, unless the applicant demonstrates that a different rate is more representative of the specific operation)

n = equipment life (generally assumed to be 10 years, unless the applicant demonstrates that a different rate is more representative of the specific operation)

$$A = \$ 2,518,000 \times \frac{0.1(1+0.1)^{10}}{(1+0.1)^{10} - 1}$$

$$= \$ 2,271,306 \times 0.1627$$

$$= \$395,541 /yr$$

$$\begin{aligned} \text{Total annualized cost} &= 395,541/yr + \$30,000/yr \text{ (operating cost)} \\ &= \$425,541/yr \end{aligned}$$

Pursuant to District practice, Emission Reduction = District Standard Emissions – Emissions with Technologically Feasible BACT

Based on the VOC emission rate (0.0092 lb/MMBtu) and control efficiency (98%) discussed in Section III.C.1, a ULE enclosed flare VOC control efficiency of 99%, the maximum heat input rating of the proposed flare (44.8 MMBtu/hr), and the proposed maximum annual operation schedule (500 hrs/yr), the VOC reduction is calculated as follows:

$$\text{Uncontrolled VOC emission rate} = (0.0092 \text{ lb/MMBtu}) / (1 - 0.98) = 0.46 \text{ lb/MMBtu}$$

$$\text{ULE enclosed flare VOC emission rate} = (0.46 \text{ lb/MMBtu}) \times (1 - 0.99) = 0.0046 \text{ lb/MMBtu}$$

$$\begin{aligned} \text{VOC reduction} &= [0.0092 - 0.0046 \text{ lb/MMBtu}] \times 44.8 \text{ MMBtu/hr} \times 500 \text{ hrs/yr} \\ &\quad \times (1 \text{ ton}/2,000 \text{ lb}) \\ &= 0.05 \text{ tons/yr} \end{aligned}$$

$$\begin{aligned} \text{NOx reduction} &= [0.06 \text{ lb/MMBtu} - 0.018 \text{ lb/MMBtu}] \times 44.8 \text{ MMBtu/hr} \times 500 \text{ hrs/yr} \\ &\quad \times (1 \text{ ton}/2,000 \text{ lb}) \\ &= 0.47 \text{ ton/yr NOx} \end{aligned}$$

Multi-Pollutant Cost Effectiveness Threshold (MCET)

As the BACT option (ULE Enclosed Flare) controls more than one type of air pollutants (VOC and NOx), a Multi-Pollutant Cost Effectiveness Threshold (MCET) for the control options are calculated as follows (please refer to example in APR 1305):

$$\begin{aligned} \text{MCET} &= 0.47 \text{ ton/yr NOx} \times \$ 24,000/\text{ton} + 0.05 \text{ ton/yr VOC} \times \$17,500/\text{ton VOC} \\ &= \$12,155/\text{yr} \end{aligned}$$

As the total annualized cost of \$ 425,541/yr exceeds this MCET, the control technology or equipment under review cannot be required as BACT by District Policy APR 1305.

Option 2: Open Flare (98% Control Efficiency)

As previously stated in Step 1, this control option is achieved in practice. Pursuant to the District's BACT policy, cost effectiveness analysis is not required for control alternatives which are deemed achieved-in-practice, except for achieved in practice alternate basic equipment or process.

e. Step 5 - Select BACT

Pursuant to the District's BACT policy, the most effective control technology not eliminated in Step 4 shall be selected as BACT. Therefore, the use of an open flare with a 98% control efficiency is selected as BACT.

Please note that the proposed flare has an annual heat input limit equivalent 22,400 MMBtu/year. This is less than the proposed usage limit in the possible Rule 4311 amendments of 100,000 MMBtu/year that would trigger the need to utilize a low NOx flare.



PROJECT SUMMARY

Project: Waste Gas Improvements at RWRP
Client: City of Fresno
Location: Fresno
Zip Code: 93706
Description: 90% Design Cost Estimate
Carollo Job # 11372A10

Estimate Class: 3
PIC: Tom Moosinger
PM: Eric Casarea
Date: April 10, 2020
By: John Wittler
Reviewed: Tom Moosinger

NO.	DESCRIPTION	TOTAL
01	General Conditions	\$200,000
02	Mediator	\$25,000
03	Civil	\$237,000
04	Equipment Pads	\$127,000
05	Process Mechanical	\$2,029,000
06	Electrical Building	\$220,000
07	General Elect-Inst	\$851,000
08	Supplemental Work	\$50,000
TOTAL DIRECT COST		\$3,738,000
	Contingency	15%
	Subtotal	\$561,000
	General Contractor Overhead, Profit & Risk	12%
	Subtotal	\$4,299,000
	Escalation to Mid-Point	1.5%
	Subtotal	\$72,000
	Sales Tax (Based on 50% of Total Direct Cost)	7.96%
	Subtotal	\$149,000
	Bid Market Allowance	0%
	Subtotal	\$0
TOTAL ESTIMATED CONSTRUCTION COST		\$5,036,000
<p><i>The cost estimate herein is based on our perception of current conditions at the project location. This estimate reflects our professional opinion of accurate costs at this time and is subject to change as the project design matures. Carollo Engineers have no control over variances in the cost of labor, materials, equipment, nor services provided by others, contractor's means and methods of executing the work or of determining prices, competitive bidding or market conditions, practices or bidding strategies. Carollo Engineers cannot and does not warrant or guarantee that proposals, bids or actual construction costs will not vary from the costs presented as shown.</i></p>		

C-9639-2-0 thru '-4-0

Top Down BACT Analysis

BACT Guideline 3.3.12 for Fossil Fuel-Fired IC Engines > 50 hp was rescinded 3/7/19. As there is no existing BACT Guideline for Fossil Fuel-Fired IC Engines, a project specific BACT Analysis will be done.

NOx Emissions

Steady State Operation

Step 1 – Identify All Control Technologies

9 ppmv NOx @ 15% O₂ as - Achieved-in-Practice BACT.

5 ppmv NOx @ 15% O₂ with SCR or equal - Technologically Feasible

2 ppmv NOx @ 15% O₂ natural gas-fired turbines - Alternate Basic Equipment

Step 2 – Eliminate Technologically Infeasible Options

The alternate basic equipment option, the use of gas turbines meeting 2 ppmv NOx, was intended for projects with 3 MW of electrical output, or greater. Turbines smaller than 3 MW are typically not capable of meeting a 2 ppmv NOx emission limit. Rather, units smaller than 3 MW typically achieve emission limits that are equivalent to the achieved in practice option of 0.15 g/bhp-hr. Therefore, no NOx emission reductions are expected if the electrical output from the unit is less than 3 MW. The proposed engines will have an electrical output of approximately 1.5 MW (1550 kW) each. Therefore, the gas turbine option is not expected to result in lower emissions and will be eliminated from consideration for this project.

The remaining control technologies from Step 1 are technologically feasible.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

- a) 5 ppmv NOx @ 15% O₂ with SCR or equal
- b) 9 ppmv NOx @ 15% O₂

Step 4 – Cost Effectiveness Analysis

The applicant is proposing 2 ppmv NOx @ 15% O₂. Therefore no cost-effectiveness analysis is not required.

Step 5 – Select BACT

BACT for the engines is an emission limit of 2 ppmv NOx @ 3% O₂, using SCR.

Commissioning

During commissioning, the engines are operated to tune the IC engine before the SCR is installed to avoid damaging the SCR and to smooth engine operation to conform within engine/SCR specification and permit requirements. Neither the SCR nor the oxidation catalyst are expected to be operational during commissioning.

Step 1 – Identify All Control Technologies

1.0 g/hp-hr (79 ppmv NO_x @ 3% O₂)

Operator shall perform expeditious completion of commissioning activities not to exceed 7 hr/day and 70 hr/yr, and shall use good work practice standards to minimize emissions.

Step 2 – Eliminate Technologically Infeasible Options

The control technologies from Step 1 are technologically feasible.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

1.0 g/hp-hr (79 ppmv NO_x @ 3% O₂)

Operator shall perform expeditious completion of commissioning activities not to exceed 7 hr/day and 70 hr/yr, and shall use good work practice standards to minimize emissions.

Step 4 – Cost Effectiveness Analysis

The applicant is proposing the most stringent control technology from Step 3, above. Therefore no cost-effectiveness analysis is required.

Step 5 – Select BACT

BACT for the engines is an emission limit of 1.0 g/hp-hr (79 ppmv NO_x @ 3% O₂).

Operator shall perform expeditious completion of commissioning activities not to exceed 7 hr/day and 70 hr/yr, and shall use good work practice standards to minimize emissions.

PM10 Emissions

Steady State

Step 1 – Identify All Control Technologies

BACT Guideline 3.3.12 lists an emissions limit of 0.06 g/bhp-hr as Achieved-in-Practice BACT. No other options are listed as Technologically Feasible or Alternate Basic Equipment.

Step 2 – Eliminate Technologically Infeasible Options

All options are technologically feasible and none will be eliminated.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

a) 0.06 g/bhp-hr

Step 4 – Cost Effectiveness Analysis

The applicant is proposing the most stringent control technology from Step 3, above. Therefore no cost-effectiveness analysis is required.

Step 5 – Select BACT

BACT for the engines is an emission limit of 0.033 g/bhp-hr.

Commissioning

No increase in PM10 emission is expected during commissioning.

VOC Emissions

Step 1 – Identify All Control Technologies

BACT Guideline 3.3.12 lists an emissions limit of 25 ppmv VOC @ 15% O₂ as Achieved-in-Practice BACT. There are no other options listed.

Step 2 – Eliminate Technologically Infeasible Options

There are no technologically infeasible options listed.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

a) 25 ppmv VOC @ 15% O₂

Step 4 – Cost Effectiveness Analysis

The applicant is proposing 4.8 ppmv@ VOC 15% O₂. Therefore no cost-effectiveness analysis is required.

Step 5 – Select BACT

BACT for the engines is an emission limit of 5 ppmv@ VOC 15% O₂.

Commissioning

Step 1 – Identify All Control Technologies

0.7 g/bhp-hr or 159 ppmv VOC as methane

Operator shall perform expeditious completion of commissioning activities not to exceed 7 hr/day and 70 hr/yr, and shall use good work practice standards to minimize emissions.

Step 2 – Eliminate Technologically Infeasible Options

All options are technologically feasible and none will be eliminated.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

0.7 g/bhp-hr or 159 ppmv VOC as methane

Operator shall perform expeditious completion of commissioning activities not to exceed 7 hr/day and 70 hr/yr, and shall use good work practice standards to minimize emissions.

Step 4 – Cost Effectiveness Analysis

The applicant is proposing the most stringent control technology from Step 3, above. Therefore no cost-effectiveness analysis is required.

Step 5 – Select BACT

BACT for the engines is an emission limit of 0.7 g/bhp-hr limited NSCR catalyst

Operator shall perform expeditious completion of commissioning activities not to exceed 7 hr/day and 70 hr/yr, and shall use good work practice standards to minimize emissions.

ATTACHMENT VI

Health Risk Assessment Results

San Joaquin Valley Air Pollution Control District Risk Management Review and Ambient Air Quality Analysis

To: [Richard Edgehill](#) – Permit Services
 From: [Adrian Ortiz](#) – Technical Services
 Date: [March 3, 2020](#)
 Facility Name: [BIOREM ENERGY, LLC](#)
 Location: [20330 Road 4, CHOWCHILLA](#)
 Application #(s): [C-9639-1-0, -2-0, -3-0, -4-0](#)
 Project #: [C-1193125](#)

1. Summary

1.1 RMR

Units	Prioritization Score	Acute Hazard Index	Chronic Hazard Index	Maximum Individual Cancer Risk	T-BACT Required	Special Permit Requirements
1	0.82	0.01	0.00	5.48E-08	No	Yes
2	31.50	0.10	0.04	6.38E-07	Yes	No
3	31.50	0.10	0.05	6.28E-07	Yes	No
4	31.50	0.10	0.04	6.42E-07	Yes	No
Project Totals	95.40	0.31	0.13	1.98E-06		
Facility Totals	>1	0.31	0.13	1.98E-06		

1.2 AAQA

Pollutant	Air Quality Standard (State/Federal)				
	1 Hour	3 Hours	8 Hours	24 Hours	Annual
CO	Pass		Pass		
NO _x	Pass				Pass
SO _x	Pass	Pass		Pass	Pass
PM10				Pass	Pass
PM2.5				Pass	Pass

Notes:

- Results were taken from the attached AAQA Report.
- The criteria pollutants are below EPA's level of significance as found in 40 CFR Part 51.165 (b)(2) unless otherwise noted below.
- Pursuant to District Policy APR-1925, a Tier 2 analysis using the Ozone Limiting Method (OLM) method was performed to demonstrate compliance with the 1-hour NO_x standard.
- Modeled PM10 concentrations were below the District SIL for non-fugitive sources of 5 µg/m³ for the 24-hour average concentration and 1 µg/m³ for the annual concentration.
- Modeled PM2.5 concentrations were below the District SIL for non-fugitive sources of 1.2 µg/m³ for the 24-hour average concentration and 0.2 µg/m³ for the annual concentration.
- Unit 1-0 is an intermittent source as defined in APR-1920. In accordance with APR-1920, compliance with short-term (i.e., 1-hour, 3-hour, 8-hour and 24-hour) standards is not required.

1.3 Proposed Permit Requirements

To ensure that human health risks will not exceed District allowable levels, the following shall be included as requirements for:

Unit # 1-0

1. The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction.
2. This flare shall be operated only for testing and maintenance of the engine, required regulatory purposes, and during emergency situations. Operation of the flare for maintenance, testing, and required regulatory purposes shall not exceed 500 hours per calendar year.

Unit # 2, 3, and 4

1. No special requirements.

T-BACT is required for this unit because of emissions of **Formaldehyde** which is a **VOC**.

2. Project Description

Technical Services received a request on **December 18, 2019** to perform a **Risk Management Review (RMR) and Ambient Air Quality Analysis (AAQA)** for the following:

- **Unit -1-0:** Biorem Energy, LLC has proposed install a digester gas production and storage operation consisting of one covered lagoon anaerobic digester (460 ft x 360 ft x 24 ft), one 44.8 MMBtu/hr backup/emergency flare, and permit exempt gas collection, conditioning, and storage equipment including hydrogen sulfide (H₂S) removal scrubber(s), knockout vessel(s), compressor(s), chiller(s), activated carbon adsorption vessel(s), carbon dioxide separation membrane unit(s), and storage tank(s)/pressure vessel(s).
- **Unit -2-0:** Biorem Energy, LLC has proposed to install a biogas upgrading operation to capture biogas and upgrade it to natural gas standards. This upgrading facility will be powered by three 2,146 BHP MTU Model 16V4000GS natural gas quality-fired lean-burn IC engine with an oxidation catalyst, ammonia slip catalyst, and a selective catalytic reduction (SCR) system, powering an electrical generator. A Commissioning period (7 hr/day, 70 hr/yr) will be authorized in order to tune the IC engine before the SCR is installed to avoid damaging the SCR and to smooth engine operations. This will be allowed for all three engines.
- **Unit -3-0:** 2,146 BHP MTU Model 16V4000GS natural gas quality-fired lean-burn IC engine with an oxidation catalyst, ammonia slip catalyst, and a selective catalytic reduction (SCR) system, powering an electrical generator
- **Unit -4-0:** 2,146 BHP MTU Model 16V4000GS natural gas quality-fired lean-burn IC engine with an oxidation catalyst, ammonia slip catalyst, and a selective catalytic reduction (SCR) system, powering an electrical generator

3. RMR Report

3.1 Analysis

The District performed an analysis pursuant to the District's Risk Management Policy for Permitting New and Modified Sources (APR 1905, May 28, 2015) to determine the possible cancer and non-cancer health impact to the nearest resident or worksite. This policy requires that

an assessment be performed on a unit by unit basis, project basis, and on a facility-wide basis. If a preliminary prioritization analysis demonstrates that:

- A unit's prioritization score is less than the District's significance threshold and;
- The project's prioritization score is less than the District's significance threshold and;
- The facility's total prioritization score is less than the District's significance threshold

Then, generally no further analysis is required.

The District's significant prioritization score threshold is defined as being equal to or greater than 1.0. If a preliminary analysis demonstrates that either the unit(s) or the project's or the facility's total prioritization score is greater than the District threshold, a screening or a refined assessment is required.

If a refined assessment is greater than one in a million but less than 20 in one million for carcinogenic impacts (Cancer Risk) and less than 1.0 for the Acute and Chronic hazard indices (Non-Carcinogenic) on a unit by unit basis, project basis and on a facility-wide basis the proposed application is considered less than significant. For units that exceed a cancer risk of 1 in one million, Toxic Best Available Control Technology (TBACT) must be implemented.

Toxic emissions for this project were calculated using the following methods:

- Toxic emissions for this proposed unit were calculated using Digester Gas Fired Internal Combustion Engine emission factors derived from the 2002 Reciprocating Internal Combustion Engine (RICE) EPA database.
- Toxic emissions for this proposed unit were calculated using 2001 Ventura County's Air Pollution Control District's emission factors for Natural Gas Fired external combustion and based on the Dairy Biomethane characterization in Pipeline Quality Biomethane: North American Guidance Document for Introduction of Dairy Waste Derived Biomethane into Existing Natural Gas Networks (2009).

These emissions were input into the San Joaquin Valley APCD's Hazard Assessment and Reporting Program (SHARP). In accordance with the District's Risk Management Policy, risks from the proposed unit's toxic emissions were prioritized using the procedure in the 2016 CAPCOA Facility Prioritization Guidelines. The prioritization score for this proposed facility was greater than 1.0 (see RMR Summary Table). Therefore, a refined health risk assessment was required.

The AERMOD model was used, with the parameters outlined below and meteorological data for 2013-2017 from Merced (rural dispersion coefficient selected) to determine the dispersion factors (i.e., the predicted concentration or X divided by the normalized source strength or Q) for a receptor grid. These dispersion factors were input into the SHARP Program, which then used the Air Dispersion Modeling and Risk Tool (ADMRT) of the Hot Spots Analysis and Reporting Program Version 2 (HARP 2) to calculate the chronic and acute hazard indices and the carcinogenic risk for the project.

The following parameters were used for the review:

Source Process Rates					
Unit ID	Process ID	Process Material	Process Units	Hourly Process Rate	Annual Process Rate
1	1	Dairy Biogas Rate	MMscf	0.06	32
2	1	NG Quality Biogas	MMscf	0.02	137
2	1	NH3	Lbs.	0.24	2073
3	1	NG Quality Biogas	MMscf	0.02	137
3	1	NH3	Lbs.	0.24	2073
4	1	NG Quality Biogas	MMscf	0.02	137
4	1	NH3	Lbs.	0.24	2073

Point Source Parameters						
Unit ID	Unit Description	Release Height (m)	Temp. (°K)	Exit Velocity (m/sec)	Stack Diameter (m)	Vertical/ Horizontal/ Capped
1	44.8 MMBtu/hr Emergency Flare	5.09	394	8.25	1.21	Vertical
2	2146 BHP Biogas IC Engine	4.57	709	59.18	0.32	Capped
3	2146 BHP Biogas IC Engine	4.57	709	59.18	0.32	Capped
4	2146 BHP Biogas IC Engine	4.57	709	59.18	0.32	Capped

4. AAQA Report

The District modeled the impact of the proposed project on the National Ambient Air Quality Standard (NAAQS) and/or California Ambient Air Quality Standard (CAAQS) in accordance with District Policy APR-1925 (Policy for District Rule 2201 AAQA Modeling) and EPA's Guideline for Air Quality Modeling (Appendix W of 40 CFR Part 51). The District uses a progressive three level approach to perform AAQAs. The first level (Level 1) uses a very conservative approach. If this analysis indicates a likely exceedance of an AAQS or Significant Impact Level (SIL), the analysis proceeds to the second level (Level 2) which implements a more refined approach. For the 1-hour NO₂ standard, there is also a third level that can be implemented if the Level 2 analysis indicates a likely exceedance of an AAQS or SIL.

The modeling analyses predicts the maximum air quality impacts using the appropriate emissions for each standard's averaging period. Required model inputs for a refined AAQA include background ambient air quality data, land characteristics, meteorological inputs, a receptor grid, and source parameters including emissions. These inputs are described in the sections that follow.

Ambient air concentrations of criteria pollutants are recorded at monitoring stations throughout the San Joaquin Valley. Monitoring stations may not measure all necessary pollutants, so background data may need to be collected from multiple sources. The following stations were used for this evaluation:

Monitoring Stations				
Pollutant	Station Name	County	City	Measurement Year
CO	Tranquillity	Fresno		2016
NOx	Madera-Pump Yard	Madera	Madera	2016
PM10	Madera-City	Madera	Madera	2016
PM2.5	Tranquillity	Fresno		2016
SOx	Fresno - Garland	Fresno	Fresno	2016
Ozone (for OLM)	Madera-Pump Yard	Madera	Madera	2014-2016

Technical Services performed modeling for directly emitted criteria pollutants with the emission rates below:

Emission Rates (lbs/hour)						
Unit ID	Process	NOx	SOx	CO	PM10	PM2.5
1	1	NA	NA	NA	NA	NA
2	1	4.73	0.05	14.20	0.16	0.16
3	1	4.73	0.05	14.20	0.16	0.16
4	1	4.73	0.05	14.20	0.16	0.16

Emission Rates (lbs/year)						
Unit ID	Process	NOx	SOx	CO	PM10	PM2.5
1	1	1,344	21,600	1030	336	366
2	1	1153	389	3872	1368	1368
3	1	1153	389	3872	1368	1368
4	1	1153	389	3872	1368	1368

The AERMOD model was used to determine if emissions from the project would cause or contribute to an exceedance of any state or federal air quality standard. The parameters outlined below and meteorological data for 2013-2017 from Merced (rural dispersion coefficient selected) were used for the analysis:

The following parameters were used for the review:

5. Conclusion

5.1 RMR

The cumulative acute and chronic indices for this facility, including this project, are below 1.0; and the cumulative cancer risk for this facility, including this project, is less than 20 in a million. However, the cancer risk for one or more units in this project is greater than 1.0 in a million. In accordance with the District's Risk Management Policy, the project is approved with Toxic Best Available Control Technology (T-BACT).

To ensure that human health risks will not exceed District allowable levels; the permit requirements listed on page 1 of this report must be included for this proposed unit.

These conclusions are based on the data provided by the applicant and the project engineer. Therefore, this analysis is valid only as long as the proposed data and parameters do not change.

5.2 AAQA

The emissions from the proposed equipment will not cause or contribute significantly to a violation of the State and National AAQS.

6. Attachments

- A. Modeling request from the project engineer
- B. Additional information from the applicant/project engineer
- C. Facility Summary
- D. AAQA results

ATTACHMENT VII
Draft ATCs

*San Joaquin Valley
Air Pollution Control District*

AUTHORITY TO CONSTRUCT

ISSUANCE DATE: DRAFT
DRAFT

PERMIT NO: C-9639-1-0

LEGAL OWNER OR OPERATOR: BIOREM ENERGY, LLC
MAILING ADDRESS: 1060 CACTUS DR
POCATELLO, ID 83204

LOCATION: 21463 ROAD 4
CHOWCHILLA, CA 93610

EQUIPMENT DESCRIPTION:

DIGESTER GAS PRODUCTION AND STORAGE OPERATION CONSISTING OF ONE COVERED LAGOON ANAEROBIC DIGESTER (460 FT X 360 FT X 24 FT), ONE 44.8 MMBTU/HR BACKUP FLARE; AND PERMIT EXEMPT GAS COLLECTION, CONDITIONING, AND STORAGE EQUIPMENT INCLUDING HYDROGEN SULFIDE (H₂S) REMOVAL SCRUBBER(S), KNOCKOUT VESSEL(S), COMPRESSOR(S), CHILLER(S), ACTIVATED CARBON ADSORPTION VESSEL(S), CARBON DIOXIDE SEPARATION MEMBRANE UNIT(S), AND STORAGE TANK(S)/PRESSURE VESSEL(S)

CONDITIONS

1. {271} All equipment shall be maintained in good operating condition and shall be operated in a manner to minimize emissions of air contaminants into the atmosphere. [District Rule 2201]
2. {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
3. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
4. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
5. {15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]
6. Only gas treated to remove sulfur shall be burned in the flare. [District Rule 2201]
7. A flame shall be present at all times whenever combustible gases are vented through the flare. [District Rule 2201]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Samir Sheikh, Executive Director / APCO

Arnaud Marjollet, Director of Permit Services

C-9639-1-0 : Sep 15 2020 2:26PM - EDGEHILR : Joint Inspection NOT Required

8. The flare outlet shall be equipped with an automatic ignition system, or shall operate with a pilot flame present at all times when combustible gases are vented through the flare, except during purge periods for automatic-ignition equipped flares. [District Rule 2201]
9. The flare shall be equipped with an operational, non-resettable, totalizing mass or volumetric fuel flow meter or other District-approved alternative method to determine the quantity of gas flared. [District Rule 2201]
10. The flare shall be operated only for testing and maintenance, required regulatory purposes, and when gas pipeline is not available. [District Rules 2201 and 4102]
11. Flaring of digester gas for testing and maintenance, required regulatory purposes, and when gas pipeline is not available shall not exceed either of the following limits: 1,075.2 MMBtu (equivalent to 1.536 MMscf @ 700 Btu/scf) in any one day and 500 hours per calendar year equivalent to 22,400 MMBtu (equivalent to 32.0 MMscf @ 700 Btu/scf). [District Rules 2201 and 4102]
12. Emissions from the flare shall not exceed any of the following limits: 0.06 lb-NO_x/MMBtu, 0.015 lb-PM₁₀/MMBtu, 0.046 lb-CO/MMBtu, or 0.006 lb-VOC/MMBtu. [District Rule 2201]
13. The VOC content of the digester gas shall not exceed 10% by weight. [District Rule 2201]
14. Flare shall only combust gas containing no more than 1 gr S/100 scf . [District Rule 2201]
15. The permittee may utilize an averaging period of up to 24 hours in length for demonstration of compliance with the flared gas sulfur content limit. [District Rules 2201 and 4801]
16. Flared gas sulfur content analysis shall be performed within 60 days of initial startup operation, and at least once every 12 months thereafter, using EPA Method 11 or EPA Method 15, as appropriate. Records of the flared gas sulfur content analysis shall be maintained and provided to the District upon request. [District Rule 2201]
17. The sulfur content of the flared gas shall be monitored and recorded at least once every calendar quarter in which a flared gas sulfur content analysis is not performed. If quarterly monitoring shows a violation of the sulfur content limit of this permit, monthly monitoring will be required until six consecutive months of monitoring show compliance with the sulfur content limit. Once compliance with the sulfur content limit is shown for six consecutive months, then the monitoring frequency may return to quarterly. Monitoring shall not be required during periods in which the flare does not operate. [District Rule 2201]
18. Monitoring of the flared gas sulfur content shall be performed using gas detection tubes calibrated for H₂S; a Testo 350 XL portable emission monitor; a continuous fuel gas monitor that meets the requirements specified in SCAQMD Rule 431.1, Attachment A; District-approved source test methods, including EPA Method 15, ASTM Method D1072, D4084, and D5504; District-approved in-line H₂S monitors; or an alternative method approved by the District. Prior to utilization of in-line monitors to demonstrate compliance with the flared gas sulfur content limit of this permit, the permittee shall submit details of the proposed monitoring system, including the make, model, and detection limits, to the District and obtain District approval for the proposed monitor(s). [District Rule 2201]
19. Records of hydrogen sulfide analyzer(s) installed or utilized and the calibration records of such analyzer(s) shall be maintained. Records are only required on such analyzer(s) utilized to demonstrate compliance with this permit. [District Rule 2201]
20. The permittee shall maintain flare operation records including the dates of operation, the purpose of operation, and the daily and annual quantities of flared gas flared, in standard cubic feet (scf). [District Rule 2201]
21. The permittee shall maintain records of annual throughput, material usage, or other information necessary to demonstrate that this stationary source (C-9639) has the potential to emit, for all processes, less than ten (10.0) tons per year of VOC and less than ten (10.0) tons per year of NO_x. [District Rule 4311]
22. All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. Records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4311]

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*San Joaquin Valley
Air Pollution Control District*

AUTHORITY TO CONSTRUCT

ISSUANCE DATE: DRAFT
DRAFT

PERMIT NO: C-9639-2-0

LEGAL OWNER OR OPERATOR: BIOREM ENERGY, LLC
MAILING ADDRESS: 1060 CACTUS DR
POCATELLO, ID 83204

LOCATION: 21463 ROAD 4
CHOWCHILLA, CA 93610

EQUIPMENT DESCRIPTION:

2,146 BHP MTU MODEL 12V4000L64 NATURAL GAS-FIRED LEAN-BURN IC ENGINE WITH AN OXIDATION CATALYST AND A SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM; POWERING AN ELECTRICAL GENERATOR

CONDITIONS

1. {3215} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
2. {3216} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]
3. The permittee shall obtain written District approval for the use of any equivalent control equipment not specifically approved by this Authority to Construct. Approval of the equivalent control equipment shall be made only after the District's determination that the submitted design and performance of the proposed alternate control equipment is equivalent to the specifically authorized equipment. [District Rule 2010]
4. The permittee's request for approval of equivalent equipment shall include the make, model, manufacturer's maximum rating, manufacturer's guaranteed emission rates, equipment drawing(s), and operational characteristics/parameters. [District Rule 2010]
5. Alternate equipment shall be of the same class and category of source as the equipment authorized by the Authority to Construct. [District Rule 2201]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Samir Sheikh, Executive Director / APCO

Arnaud Marjollet, Director of Permit Services

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6. No emission factor and no emission shall be greater for the alternate equipment than for the proposed equipment. No changes in the hours of operation, operating rate, throughput, or power rating may be authorized for any alternate equivalent equipment. The power rating of the equivalent equipment shall not be greater than 2,146 bhp. [District Rule 2201]
7. All equipment shall be maintained in good operating condition and shall be operated in a manner consistent with good air pollution control practice to minimize emissions of air contaminants. [District Rule 2201]
8. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
9. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
10. {15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]
11. {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
12. This engine shall be operated and maintained in proper operating condition per the manufacturer's requirements as specified on the Inspection and Monitoring (I&M) plan submitted to the District. . [District Rule 4702]
13. This engine shall be equipped with an operational non-resettable elapsed time meter or other APCO approved alternative. [District Rules 2201 and 4702]
14. {1897} This engine shall be equipped with either a positive crankcase ventilation (PCV) system that recirculates crankcase emissions into the air intake system for combustion, or a crankcase emissions control device of at least 90% control efficiency. [District Rule 2201]
15. Ammonia (NH₃) emissions from this engine shall not exceed 10 ppmvd @ 15% O₂. [District Rules 2201 and 4102]
16. IC engine shall combust only PUC-regulated natural gas. [District Rules 2201, 4702, and 4801]
17. Operator shall perform expeditious completion of commissioning activities not to exceed 7 hr/day and 70 hr/yr, and shall use good work practice standards to minimize emissions. [District Rule 2201]
18. The owner/operator shall minimize the emissions from the engine to the maximum extent possible during the commissioning period. [District Rule 2201]
19. During commissioning period, use of oxidation catalyst and SCR systems are not required. [District Rule 2201]
20. Commissioning activities are defined as, but not limited to, all testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to ensure safe and reliable operation of the reciprocating IC engine, emission control equipment, and associated electrical delivery systems. [District Rule 2201]
21. Commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when a reciprocating engine is first fired, whichever occurs first. The commissioning period shall terminate when the engine has completed initial performance testing, completed initial engine tuning, and the engine is available for commercial operation. [District Rule 2201]
22. The permittee shall submit a summary of activities to be performed during the commissioning period to the District at least two weeks prior to the first firing of this engine. The summary shall include a list of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but are not limited to, the tuning of the engine, the installation and operation of the SCR system, the installation, calibration, and testing of emissions monitors, and any activities requiring the firing of this unit without abatement by the SCR system. [District Rule 2201]
23. During the commissioning period permittee shall monitor and record the stack concentration of NO_x, CO, NH₃, and O₂ at least once daily using a portable emission monitor that meets District specifications. If either the NO_x or CO concentrations corrected to 15% O₂, as measured by the portable analyzer, exceed the allowable emission concentration for commissioning, NSCR catalyst unit(s) shall be added and/or replaced as necessary to bring the unit back into compliance. [District Rule 2201]

24. No more than one (1) of units C-9639-2 thru -4 may be commissioned at any given time. While commissioning any of these units, any number of the other three (3) units may be operated as long as they are operated under their normal, non-commissioning parameters. [District Rules 2201 and 4102]
25. Air-to-fuel ratio controller(s) shall be maintained and operated appropriately in order to ensure proper operation of the engine and control device to minimize emissions at all times. [District Rule 2201 and 40 CFR 60, Subpart JJJJ]
26. At the earliest feasible opportunity, in accordance with the recommendations of the equipment supplier and the construction contractor, the engine shall be tuned to minimize emissions. [District Rule 2201]
27. At the earliest feasible opportunity, in accordance with the recommendations of the equipment supplier and the construction contractor, the Selective Catalytic Reduction (SCR) system and oxidation catalyst shall be installed, adjusted, and operated to minimize emissions from this unit. [District Rule 2201]
28. Emissions from this engine during the commissioning period shall not exceed any of the following limits: 79 ppmvd NO_x @ 15% O₂, NO_x referenced as NO₂; 0.033 g-PM₁₀/bhp-hr; 389 ppmvd CO @ 15% O₂; and 159 ppmvd VOC @ 15% O₂, VOC referenced as methane. [District Rule 2201]
29. The total number of firing hours of this unit without abatement of emissions by the SCR and oxidation catalyst systems shall not exceed 70 hours during the commissioning period. Such operation of this unit without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR and oxidation catalyst systems. Upon completion of these activities, the permittee shall provide written notice to the District and the unused balance of the 70 firing hours without abatement shall expire. [District Rule 2201]
30. Emissions from this engine after the commissioning period shall not exceed any of the following limits: 2 ppmvd NO_x @ 15% O₂, NO_x referenced as NO₂; 0.033 g-PM₁₀/bhp-hr; 9 ppmvd CO @ 15% O₂; and 5 ppmvd VOC @ 15% O₂, VOC referenced as methane. [District Rules 2201 and 4702]
31. The inlet temperature of the SCR catalyst and the reagent injection rate shall be monitored and recorded during times in which NO_x emissions are being source tested or monitored with a portable analyzer. [District Rules 2201 and 4702]
32. The SCR catalyst shall be maintained and replaced in accordance with the recommendations of the catalyst manufacturer or emission control supplier. Records of catalyst maintenance and replacement shall be maintained. [District Rule 2201 and 4702]
33. {4037} During periods of operation, the permittee shall monitor the operational characteristics of the engine as recommended by the manufacturer or emission control system supplier (for example: check engine fluid levels, battery, cables and connections; change engine oil and filters; replace engine coolant; and/or other operational characteristics as recommended by the manufacturer or supplier). [District Rule 4702]
34. Source testing to measure NO_x, CO, VOC, and ammonia (NH₃) emissions from this unit shall be conducted within 60 days of startup and at least once every 24 months of operation thereafter. [District Rules 1081, 2201, and 4702]
35. {3791} Emissions source testing shall be conducted with the engine operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. [District Rule 4702]
36. For emissions source testing, the arithmetic average of three 60-consecutive-minute test runs shall apply. Each test run shall be conducted within 10 percent of 100 percent peak (or the highest achievable) load. If two of three runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. VOC emissions shall be reported as both methane and propane. NO_x, CO, VOC, and NH₃ concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702]
37. Compliance with the applicable emission limits of NO_x, CO, and VOC shall be demonstrated by submittal of annual emission test results, within 30 days of the test date, to the District, from a unit or units that represents a specified group of units, provided all of the following are requirements are satisfied: The units are located at the same stationary source; the units were produced by the same manufacturer, have the same model number or other manufacturer's designation in common, and have the same rated capacity and operating specifications; the units are operated and maintained in a similar manner; and at least 20% of the total number of units are tested during each annual test cycle. [District Rule 4702]

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CONDITIONS CONTINUE ON NEXT PAGE

38. If any of the representative units exceed the required emission limits, or if the District notifies the operator that the criteria in Sections 6.3.6.1 through 6.3.6.5 have not been fulfilled, each of the units in the group shall individually demonstrate compliance by emissions testing. Failure to complete emissions testing within 90 days of the failed test shall result in the untested units being in violation of this rule. After compliance with the requirements of Section 6.3.6.6 has been demonstrated, subsequent source testing shall be performed pursuant to Sections 6.3.2 or 6.3.6. [District Rule 4702]
39. The following methods shall be used for emissions source testing: NO_x (ppmv) - EPA Method 7E; CO (ppmv) - EPA Method 10; VOC (ppmv) - EPA Method 18, 25A or 25B; stack gas oxygen - EPA Method 3 or 3A; stack gas velocity - EPA Method 2 or EPA Method 19; stack gas moisture content - EPA Method 4; PM₁₀ (filterable and condensable) - EPA Method 201 and 202, EPA Method 201a and 202, ARB Method 5 (front half and back half), or ARB Method 5 (front half and back half) in combination with Method 501; NH₃ - BAAQMD ST-1B or SCAQMD Method 207-1. Alternative test methods as approved by EPA and the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702]
40. {109} Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081]
41. The results of each source test shall be submitted to the District and EPA within 60 days after completion of the source test. [District Rules 1081 and 4702]
42. The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NO_x, CO, and O₂ analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081]
43. During non-commissioning operation, the permittee shall monitor and record the stack concentration of NO_x, CO, and O₂ at least once every calendar quarter (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall be performed not less than once every month for 12 months if 2 consecutive deviations are observed during quarterly monitoring. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month if on a monthly monitoring schedule, or within the last quarter if on a quarterly monitoring schedule. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rule 4702]
44. During non-commissioning operation, if either the NO_x or CO concentrations corrected to 15% O₂, as measured by the portable analyzer, exceed the allowable emission concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of performing the notification and testing required by this condition. [District Rule 4702]
45. During non-commissioning operation, all alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rule 4702]
46. During both commissioning and non-commissioning operation, the permittee shall maintain records of: (1) the date and time of NO_x, CO, and O₂ measurements, (2) the O₂ concentration in percent and the measured NO_x and CO concentrations corrected to 15% O₂, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rule 4702]

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CONDITIONS CONTINUE ON NEXT PAGE

47. The results of the measurements taken with the District approved analyzer shall be retained on-site at all times. [District Rule 1081]
48. {3787} All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rule 4702]
49. The permittee shall maintain records of: (1) the date and time of NO_x, CO, O₂, and NH₃ measurements, (2) the O₂ concentration in percent and the measured NO_x and CO concentrations, corrected to 15% O₂; and NH₃ concentration, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, (5) the method of determining the NH₃ emissions concentration, and (6) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 2201 and 4702]
50. This engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer or emissions control system supplier, and as specified in the Inspection and Monitoring (I&M) plan. [District Rule 4702]
51. The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: the total hours of operation, the type and quantity of fuel used, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. Quantity of fuel used shall be recorded in standard cubic feet using a non-resettable, totalizing mass or volumetric fuel flow meter or other APCO approved-device. [District Rules 2201 and 4702]
52. The owner/operator shall submit to the APCO for approval, and Inspection and Maintenance (I&M) plan that specifies all actions to be taken to satisfy all of the requirements of Rule 4702 Sections 5.8 and 6.5. [District Rule 4702]
53. The operator shall collect data through the I&M plan in a form approved by the APCO. [District Rule 4702]
54. {3212} The permittee shall update the I&M plan for this engine prior to any planned change in operation. The permittee must notify the District no later than seven days after changing the I&M plan and must submit an updated I&M plan to the APCO for approval no later than 14 days after the change. The date and time of the change to the I&M plan shall be recorded in the engine's operating log. For modifications, the revised I&M plan shall be submitted to and approved by the APCO prior to issuance of the Permit to Operate. The permittee may request a change to the I&M plan at any time. [District Rule 4702]
55. Permittee shall keep records of natural gas purchase and/or tariff agreements for inspection by the District upon request. [District Rule]
56. The permittee shall record total operating time of the engine in hours during the commissioning period. [District Rule 2201]
57. All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. All records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4702]

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San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

ISSUANCE DATE: DRAFT
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PERMIT NO: C-9639-3-0

LEGAL OWNER OR OPERATOR: BIOREM ENERGY, LLC
MAILING ADDRESS: 1060 CACTUS DR
POCATELLO, ID 83204

LOCATION: 21463 ROAD 4
CHOWCHILLA, CA 93610

EQUIPMENT DESCRIPTION:

2,146 BHP MTU MODEL 12V4000L64 NATURAL GAS-FIRED LEAN-BURN IC ENGINE WITH AN OXIDATION CATALYST AND A SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM; POWERING AN ELECTRICAL GENERATOR

CONDITIONS

1. {3215} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
2. {3216} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]
3. The permittee shall obtain written District approval for the use of any equivalent control equipment not specifically approved by this Authority to Construct. Approval of the equivalent control equipment shall be made only after the District's determination that the submitted design and performance of the proposed alternate control equipment is equivalent to the specifically authorized equipment. [District Rule 2010]
4. The permittee's request for approval of equivalent equipment shall include the make, model, manufacturer's maximum rating, manufacturer's guaranteed emission rates, equipment drawing(s), and operational characteristics/parameters. [District Rule 2010]
5. Alternate equipment shall be of the same class and category of source as the equipment authorized by the Authority to Construct. [District Rule 2201]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Samir Sheikh, Executive Director / APCO

Arnaud Marjollet, Director of Permit Services

C-9639-3-0 : Sep 15 2020 11:39AM -- EDGEHILR : Joint Inspection NOT Required

6. No emission factor and no emission shall be greater for the alternate equipment than for the proposed equipment. No changes in the hours of operation, operating rate, throughput, or power rating may be authorized for any alternate equivalent equipment. The power rating of the equivalent equipment shall not be greater than 2,146 bhp. [District Rule 2201]
7. All equipment shall be maintained in good operating condition and shall be operated in a manner consistent with good air pollution control practice to minimize emissions of air contaminants. [District Rule 2201]
8. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
9. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
10. {15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]
11. {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
12. This engine shall be operated and maintained in proper operating condition per the manufacturer's requirements as specified on the Inspection and Monitoring (I&M) plan submitted to the District. . [District Rule 4702]
13. This engine shall be equipped with an operational non-resettable elapsed time meter or other APCO approved alternative. [District Rules 2201 and 4702]
14. {1897} This engine shall be equipped with either a positive crankcase ventilation (PCV) system that recirculates crankcase emissions into the air intake system for combustion, or a crankcase emissions control device of at least 90% control efficiency. [District Rule 2201]
15. Ammonia (NH₃) emissions from this engine shall not exceed 10 ppmvd @ 15% O₂. [District Rules 2201 and 4102]
16. IC engine shall combust only PUC-regulated natural gas. [District Rules 2201, 4702, and 4801]
17. Operator shall perform expeditious completion of commissioning activities not to exceed 7 hr/day and 70 hr/yr, and shall use good work practice standards to minimize emissions. [District Rule 2201]
18. The owner/operator shall minimize the emissions from the engine to the maximum extent possible during the commissioning period. [District Rule 2201]
19. During commissioning period, use of oxidation catalyst and SCR systems are not required. [District Rule 2201]
20. Commissioning activities are defined as, but not limited to, all testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to ensure safe and reliable operation of the reciprocating IC engine, emission control equipment, and associated electrical delivery systems. [District Rule 2201]
21. Commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when a reciprocating engine is first fired, whichever occurs first. The commissioning period shall terminate when the engine has completed initial performance testing, completed initial engine tuning, and the engine is available for commercial operation. [District Rule 2201]
22. The permittee shall submit a summary of activities to be performed during the commissioning period to the District at least two weeks prior to the first firing of this engine. The summary shall include a list of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but are not limited to, the tuning of the engine, the installation and operation of the SCR system, the installation, calibration, and testing of emissions monitors, and any activities requiring the firing of this unit without abatement by the SCR system. [District Rule 2201]
23. During the commissioning period permittee shall monitor and record the stack concentration of NO_x, CO, NH₃, and O₂ at least once daily using a portable emission monitor that meets District specifications. If either the NO_x or CO concentrations corrected to 15% O₂, as measured by the portable analyzer, exceed the allowable emission concentration for commissioning, NSCR catalyst unit(s) shall be added and/or replaced as necessary to bring the unit back into compliance. [District Rule 2201]

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CONDITIONS CONTINUE ON NEXT PAGE

24. No more than one (1) of units C-9639-2 thru -4 may be commissioned at any given time. While commissioning any of these units, any number of the other three (3) units may be operated as long as they are operated under their normal, non-commissioning parameters. [District Rules 2201 and 4102]
25. Air-to-fuel ratio controller(s) shall be maintained and operated appropriately in order to ensure proper operation of the engine and control device to minimize emissions at all times. [District Rule 2201 and 40 CFR 60, Subpart JJJJ]
26. At the earliest feasible opportunity, in accordance with the recommendations of the equipment supplier and the construction contractor, the engine shall be tuned to minimize emissions. [District Rule 2201]
27. At the earliest feasible opportunity, in accordance with the recommendations of the equipment supplier and the construction contractor, the Selective Catalytic Reduction (SCR) system and oxidation catalyst shall be installed, adjusted, and operated to minimize emissions from this unit. [District Rule 2201]
28. Emissions from this engine during the commissioning period shall not exceed any of the following limits: 79 ppmvd NO_x @ 15% O₂, NO_x referenced as NO₂; 0.033 g-PM₁₀/bhp-hr; 389 ppmvd CO @ 15% O₂; and 159 ppmvd VOC @ 15% O₂, VOC referenced as methane. [District Rule 2201]
29. The total number of firing hours of this unit without abatement of emissions by the SCR and oxidation catalyst systems shall not exceed 70 hours during the commissioning period. Such operation of this unit without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR and oxidation catalyst systems. Upon completion of these activities, the permittee shall provide written notice to the District and the unused balance of the 70 firing hours without abatement shall expire. [District Rule 2201]
30. Emissions from this engine after the commissioning period shall not exceed any of the following limits: 2 ppmvd NO_x @ 15% O₂, NO_x referenced as NO₂; 0.033 g-PM₁₀/bhp-hr; 9 ppmvd CO @ 15% O₂; and 5 ppmvd VOC @ 15% O₂, VOC referenced as methane. [District Rules 2201 and 4702]
31. The inlet temperature of the SCR catalyst and the reagent injection rate shall be monitored and recorded during times in which NO_x emissions are being source tested or monitored with a portable analyzer. [District Rules 2201 and 4702]
32. The SCR catalyst shall be maintained and replaced in accordance with the recommendations of the catalyst manufacturer or emission control supplier. Records of catalyst maintenance and replacement shall be maintained. [District Rule 2201 and 4702]
33. {4037} During periods of operation, the permittee shall monitor the operational characteristics of the engine as recommended by the manufacturer or emission control system supplier (for example: check engine fluid levels, battery, cables and connections; change engine oil and filters; replace engine coolant; and/or other operational characteristics as recommended by the manufacturer or supplier). [District Rule 4702]
34. Source testing to measure NO_x, CO, VOC, and ammonia (NH₃) emissions from this unit shall be conducted within 60 days of startup and at least once every 24 months of operation thereafter. [District Rules 1081, 2201, and 4702]
35. {3791} Emissions source testing shall be conducted with the engine operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. [District Rule 4702]
36. For emissions source testing, the arithmetic average of three 60-consecutive-minute test runs shall apply. Each test run shall be conducted within 10 percent of 100 percent peak (or the highest achievable) load. If two of three runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. VOC emissions shall be reported as both methane and propane. NO_x, CO, VOC, and NH₃ concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702]
37. Compliance with the applicable emission limits of NO_x, CO, and VOC shall be demonstrated by submittal of annual emission test results, within 30 days of the test date, to the District, from a unit or units that represents a specified group of units, provided all of the following are requirements are satisfied: The units are located at the same stationary source; the units were produced by the same manufacturer, have the same model number or other manufacturer's designation in common, and have the same rated capacity and operating specifications; the units are operated and maintained in a similar manner; and at least 20% of the total number of units are tested during each annual test cycle. [District Rule 4702]

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38. If any of the representative units exceed the required emission limits, or if the District notifies the operator that the criteria in Sections 6.3.6.1 through 6.3.6.5 have not been fulfilled, each of the units in the group shall individually demonstrate compliance by emissions testing. Failure to complete emissions testing within 90 days of the failed test shall result in the untested units being in violation of this rule. After compliance with the requirements of Section 6.3.6.6 has been demonstrated, subsequent source testing shall be performed pursuant to Sections 6.3.2 or 6.3.6. [District Rule 4702]
39. The following methods shall be used for emissions source testing: NO_x (ppmv) - EPA Method 7E; CO (ppmv) - EPA Method 10; VOC (ppmv) - EPA Method 18, 25A or 25B; stack gas oxygen - EPA Method 3 or 3A; stack gas velocity - EPA Method 2 or EPA Method 19; stack gas moisture content - EPA Method 4; PM₁₀ (filterable and condensable) - EPA Method 201 and 202, EPA Method 201a and 202, ARB Method 5 (front half and back half), or ARB Method 5 (front half and back half) in combination with Method 501; NH₃ - BAAQMD ST-1B or SCAQMD Method 207-1. Alternative test methods as approved by EPA and the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702]
40. {109} Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081]
41. The results of each source test shall be submitted to the District and EPA within 60 days after completion of the source test. [District Rules 1081 and 4702]
42. The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NO_x, CO, and O₂ analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081]
43. During non-commissioning operation, the permittee shall monitor and record the stack concentration of NO_x, CO, and O₂ at least once every calendar quarter (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall be performed not less than once every month for 12 months if 2 consecutive deviations are observed during quarterly monitoring. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month if on a monthly monitoring schedule, or within the last quarter if on a quarterly monitoring schedule. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rule 4702]
44. During non-commissioning operation, if either the NO_x or CO concentrations corrected to 15% O₂, as measured by the portable analyzer, exceed the allowable emission concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of performing the notification and testing required by this condition. [District Rule 4702]
45. During non-commissioning operation, all alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rule 4702]
46. During both commissioning and non-commissioning operation, the permittee shall maintain records of: (1) the date and time of NO_x, CO, and O₂ measurements, (2) the O₂ concentration in percent and the measured NO_x and CO concentrations corrected to 15% O₂, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rule 4702]

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47. The results of the measurements taken with the District approved analyzer shall be retained on-site at all times. [District Rule 1081]
48. {3787} All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rule 4702]
49. The permittee shall maintain records of: (1) the date and time of NO_x, CO, O₂, and NH₃ measurements, (2) the O₂ concentration in percent and the measured NO_x and CO concentrations, corrected to 15% O₂; and NH₃ concentration, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, (5) the method of determining the NH₃ emissions concentration, and (6) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 2201 and 4702]
50. This engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer or emissions control system supplier, and as specified in the Inspection and Monitoring (I&M) plan. [District Rule 4702]
51. The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: the total hours of operation, the type and quantity of fuel used, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. Quantity of fuel used shall be recorded in standard cubic feet using a non-resettable, totalizing mass or volumetric fuel flow meter or other APCO approved-device. [District Rules 2201 and 4702]
52. The owner/operator shall submit to the APCO for approval, and Inspection and Maintenance (I&M) plan that specifies all actions to be taken to satisfy all of the requirements of Rule 4702 Sections 5.8 and 6.5. [District Rule 4702]
53. The operator shall collect data through the I&M plan in a form approved by the APCO. [District Rule 4702]
54. {3212} The permittee shall update the I&M plan for this engine prior to any planned change in operation. The permittee must notify the District no later than seven days after changing the I&M plan and must submit an updated I&M plan to the APCO for approval no later than 14 days after the change. The date and time of the change to the I&M plan shall be recorded in the engine's operating log. For modifications, the revised I&M plan shall be submitted to and approved by the APCO prior to issuance of the Permit to Operate. The permittee may request a change to the I&M plan at any time. [District Rule 4702]
55. Permittee shall keep records of natural gas purchase and/or tariff agreements for inspection by the District upon request. [District Rule]
56. The permittee shall record total operating time of the engine in hours during the commissioning period. [District Rule 2201]
57. All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. All records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4702]

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*San Joaquin Valley
Air Pollution Control District*

AUTHORITY TO CONSTRUCT

ISSUANCE DATE: DRAFT
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PERMIT NO: C-9639-4-0

LEGAL OWNER OR OPERATOR: BIOREM ENERGY, LLC
MAILING ADDRESS: 1060 CACTUS DR
POCATELLO, ID 83204

LOCATION: 21463 ROAD 4
CHOWCHILLA, CA 93610

EQUIPMENT DESCRIPTION:

2,146 BHP MTU MODEL 12V4000L64 NATURAL GAS-FIRED LEAN-BURN IC ENGINE WITH AN OXIDATION CATALYST AND A SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM; POWERING AN ELECTRICAL GENERATOR

CONDITIONS

1. {3215} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
2. {3216} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]
3. The permittee shall obtain written District approval for the use of any equivalent control equipment not specifically approved by this Authority to Construct. Approval of the equivalent control equipment shall be made only after the District's determination that the submitted design and performance of the proposed alternate control equipment is equivalent to the specifically authorized equipment. [District Rule 2010]
4. The permittee's request for approval of equivalent equipment shall include the make, model, manufacturer's maximum rating, manufacturer's guaranteed emission rates, equipment drawing(s), and operational characteristics/parameters. [District Rule 2010]
5. Alternate equipment shall be of the same class and category of source as the equipment authorized by the Authority to Construct. [District Rule 2201]

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YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Samir Sheikh, Executive Director / APCO

Arnaud Marjollet, Director of Permit Services

C-9639-4-0 : Sep 15 2020 11:40AM -- EDGEHILR : Joint Inspection NOT Required

6. No emission factor and no emission shall be greater for the alternate equipment than for the proposed equipment. No changes in the hours of operation, operating rate, throughput, or power rating may be authorized for any alternate equivalent equipment. The power rating of the equivalent equipment shall not be greater than 2,146 bhp. [District Rule 2201]
7. All equipment shall be maintained in good operating condition and shall be operated in a manner consistent with good air pollution control practice to minimize emissions of air contaminants. [District Rule 2201]
8. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
9. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
10. {15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]
11. {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
12. This engine shall be operated and maintained in proper operating condition per the manufacturer's requirements as specified on the Inspection and Monitoring (I&M) plan submitted to the District. . [District Rule 4702]
13. This engine shall be equipped with an operational non-resettable elapsed time meter or other APCO approved alternative. [District Rules 2201 and 4702]
14. {1897} This engine shall be equipped with either a positive crankcase ventilation (PCV) system that recirculates crankcase emissions into the air intake system for combustion, or a crankcase emissions control device of at least 90% control efficiency. [District Rule 2201]
15. Ammonia (NH₃) emissions from this engine shall not exceed 10 ppmvd @ 15% O₂. [District Rules 2201 and 4102]
16. IC engine shall combust only PUC-regulated natural gas. [District Rules 2201, 4702, and 4801]
17. Operator shall perform expeditious completion of commissioning activities not to exceed 7 hr/day and 70 hr/yr, and shall use good work practice standards to minimize emissions. [District Rule 2201]
18. The owner/operator shall minimize the emissions from the engine to the maximum extent possible during the commissioning period. [District Rule 2201]
19. During commissioning period, use of oxidation catalyst and SCR systems are not required. [District Rule 2201]
20. Commissioning activities are defined as, but not limited to, all testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to ensure safe and reliable operation of the reciprocating IC engine, emission control equipment, and associated electrical delivery systems. [District Rule 2201]
21. Commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when a reciprocating engine is first fired, whichever occurs first. The commissioning period shall terminate when the engine has completed initial performance testing, completed initial engine tuning, and the engine is available for commercial operation. [District Rule 2201]
22. The permittee shall submit a summary of activities to be performed during the commissioning period to the District at least two weeks prior to the first firing of this engine. The summary shall include a list of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but are not limited to, the tuning of the engine, the installation and operation of the SCR system, the installation, calibration, and testing of emissions monitors, and any activities requiring the firing of this unit without abatement by the SCR system. [District Rule 2201]
23. During the commissioning period permittee shall monitor and record the stack concentration of NO_x, CO, NH₃, and O₂ at least once daily using a portable emission monitor that meets District specifications. If either the NO_x or CO concentrations corrected to 15% O₂, as measured by the portable analyzer, exceed the allowable emission concentration for commissioning, NSCR catalyst unit(s) shall be added and/or replaced as necessary to bring the unit back into compliance. [District Rule 2201]

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24. No more than one (1) of units C-9639-2 thru -4 may be commissioned at any given time. While commissioning any of these units, any number of the other three (3) units may be operated as long as they are operated under their normal, non-commissioning parameters. [District Rules 2201 and 4102]
25. Air-to-fuel ratio controller(s) shall be maintained and operated appropriately in order to ensure proper operation of the engine and control device to minimize emissions at all times. [District Rule 2201 and 40 CFR 60, Subpart JJJJ]
26. At the earliest feasible opportunity, in accordance with the recommendations of the equipment supplier and the construction contractor, the engine shall be tuned to minimize emissions. [District Rule 2201]
27. At the earliest feasible opportunity, in accordance with the recommendations of the equipment supplier and the construction contractor, the Selective Catalytic Reduction (SCR) system and oxidation catalyst shall be installed, adjusted, and operated to minimize emissions from this unit. [District Rule 2201]
28. Emissions from this engine during the commissioning period shall not exceed any of the following limits: 79 ppmvd NO_x @ 15% O₂, NO_x referenced as NO₂; 0.033 g-PM₁₀/bhp-hr; 389 ppmvd CO @ 15% O₂; and 159 ppmvd VOC @ 15% O₂, VOC referenced as methane. [District Rule 2201]
29. The total number of firing hours of this unit without abatement of emissions by the SCR and oxidation catalyst systems shall not exceed 70 hours during the commissioning period. Such operation of this unit without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR and oxidation catalyst systems. Upon completion of these activities, the permittee shall provide written notice to the District and the unused balance of the 70 firing hours without abatement shall expire. [District Rule 2201]
30. Emissions from this engine after the commissioning period shall not exceed any of the following limits: 2 ppmvd NO_x @ 15% O₂, NO_x referenced as NO₂; 0.033 g-PM₁₀/bhp-hr; 9 ppmvd CO @ 15% O₂; and 5 ppmvd VOC @ 15% O₂, VOC referenced as methane. [District Rules 2201 and 4702]
31. The inlet temperature of the SCR catalyst and the reagent injection rate shall be monitored and recorded during times in which NO_x emissions are being source tested or monitored with a portable analyzer. [District Rules 2201 and 4702]
32. The SCR catalyst shall be maintained and replaced in accordance with the recommendations of the catalyst manufacturer or emission control supplier. Records of catalyst maintenance and replacement shall be maintained. [District Rule 2201 and 4702]
33. {4037} During periods of operation, the permittee shall monitor the operational characteristics of the engine as recommended by the manufacturer or emission control system supplier (for example: check engine fluid levels, battery, cables and connections; change engine oil and filters; replace engine coolant; and/or other operational characteristics as recommended by the manufacturer or supplier). [District Rule 4702]
34. Source testing to measure NO_x, CO, VOC, and ammonia (NH₃) emissions from this unit shall be conducted within 60 days of startup and at least once every 24 months of operation thereafter. [District Rules 1081, 2201, and 4702]
35. {3791} Emissions source testing shall be conducted with the engine operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. [District Rule 4702]
36. For emissions source testing, the arithmetic average of three 60-consecutive-minute test runs shall apply. Each test run shall be conducted within 10 percent of 100 percent peak (or the highest achievable) load. If two of three runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. VOC emissions shall be reported as both methane and propane. NO_x, CO, VOC, and NH₃ concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702]
37. Compliance with the applicable emission limits of NO_x, CO, and VOC shall be demonstrated by submittal of annual emission test results, within 30 days of the test date, to the District, from a unit or units that represents a specified group of units, provided all of the following are requirements are satisfied: The units are located at the same stationary source; the units were produced by the same manufacturer, have the same model number or other manufacturer's designation in common, and have the same rated capacity and operating specifications; the units are operated and maintained in a similar manner; and at least 20% of the total number of units are tested during each annual test cycle. [District Rule 4702]

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38. If any of the representative units exceed the required emission limits, or if the District notifies the operator that the criteria in Sections 6.3.6.1 through 6.3.6.5 have not been fulfilled, each of the units in the group shall individually demonstrate compliance by emissions testing. Failure to complete emissions testing within 90 days of the failed test shall result in the untested units being in violation of this rule. After compliance with the requirements of Section 6.3.6.6 has been demonstrated, subsequent source testing shall be performed pursuant to Sections 6.3.2 or 6.3.6. [District Rule 4702]
39. The following methods shall be used for emissions source testing: NO_x (ppmv) - EPA Method 7E; CO (ppmv) - EPA Method 10; VOC (ppmv) - EPA Method 18, 25A or 25B; stack gas oxygen - EPA Method 3 or 3A; stack gas velocity - EPA Method 2 or EPA Method 19; stack gas moisture content - EPA Method 4; PM₁₀ (filterable and condensable) - EPA Method 201 and 202, EPA Method 201a and 202, ARB Method 5 (front half and back half), or ARB Method 5 (front half and back half) in combination with Method 501; NH₃ - BAAQMD ST-1B or SCAQMD Method 207-1. Alternative test methods as approved by EPA and the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702]
40. {109} Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081]
41. The results of each source test shall be submitted to the District and EPA within 60 days after completion of the source test. [District Rules 1081 and 4702]
42. The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NO_x, CO, and O₂ analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081]
43. During non-commissioning operation, the permittee shall monitor and record the stack concentration of NO_x, CO, and O₂ at least once every calendar quarter (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall be performed not less than once every month for 12 months if 2 consecutive deviations are observed during quarterly monitoring. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month if on a monthly monitoring schedule, or within the last quarter if on a quarterly monitoring schedule. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rule 4702]
44. During non-commissioning operation, if either the NO_x or CO concentrations corrected to 15% O₂, as measured by the portable analyzer, exceed the allowable emission concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of performing the notification and testing required by this condition. [District Rule 4702]
45. During non-commissioning operation, all alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rule 4702]
46. During both commissioning and non-commissioning operation, the permittee shall maintain records of: (1) the date and time of NO_x, CO, and O₂ measurements, (2) the O₂ concentration in percent and the measured NO_x and CO concentrations corrected to 15% O₂, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rule 4702]

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47. The results of the measurements taken with the District approved analyzer shall be retained on-site at all times. [District Rule 1081]
48. {3787} All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rule 4702]
49. The permittee shall maintain records of: (1) the date and time of NO_x, CO, O₂, and NH₃ measurements, (2) the O₂ concentration in percent and the measured NO_x and CO concentrations, corrected to 15% O₂; and NH₃ concentration, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, (5) the method of determining the NH₃ emissions concentration, and (6) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 2201 and 4702]
50. This engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer or emissions control system supplier, and as specified in the Inspection and Monitoring (I&M) plan. [District Rule 4702]
51. The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: the total hours of operation, the type and quantity of fuel used, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. Quantity of fuel used shall be recorded in standard cubic feet using a non-resettable, totalizing mass or volumetric fuel flow meter or other APCO approved-device. [District Rules 2201 and 4702]
52. The owner/operator shall submit to the APCO for approval, and Inspection and Maintenance (I&M) plan that specifies all actions to be taken to satisfy all of the requirements of Rule 4702 Sections 5.8 and 6.5. [District Rule 4702]
53. The operator shall collect data through the I&M plan in a form approved by the APCO. [District Rule 4702]
54. {3212} The permittee shall update the I&M plan for this engine prior to any planned change in operation. The permittee must notify the District no later than seven days after changing the I&M plan and must submit an updated I&M plan to the APCO for approval no later than 14 days after the change. The date and time of the change to the I&M plan shall be recorded in the engine's operating log. For modifications, the revised I&M plan shall be submitted to and approved by the APCO prior to issuance of the Permit to Operate. The permittee may request a change to the I&M plan at any time. [District Rule 4702]
55. Permittee shall keep records of natural gas purchase and/or tariff agreements for inspection by the District upon request. [District Rule]
56. The permittee shall record total operating time of the engine in hours during the commissioning period. [District Rule 2201]
57. All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. All records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4702]

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