



MAR 25 2016

John Fiscalini
Fiscalini Farms & Fiscalini Dairy
7231 Covert Rd
Modesto, CA 95358-9741

Re: Notice of Preliminary Decision - Authority to Construct
Facility Number: N-6311
Project Number: N-1153078

Dear Mr. Fiscalini:

Enclosed for your review and comment is the District's analysis of Fiscalini Farms & Fiscalini Dairy's application for an Authority to Construct for a 1,057 bhp digester gas-fired IC engine with a selective catalytic reduction (SCR) system for control of emissions powering an electrical generator and a digester gas backup flare, at 4848 Jackson Road, Modesto, CA.

The notice of preliminary decision for this project will be published approximately three days from the date of this letter. 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. Ramon Norman of Permit Services at (559) 230-5909.

Sincerely,



Arnaud Marjollet
Director of Permit Services

AM:rn

Enclosures

cc: Tung Le, CARB (w/ enclosure) via email

Seyed Sadredin
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San Joaquin Valley Air Pollution Control District

Authority to Construct Application Review

Digester Gas-Fired IC Engine with SCR and Backup Digester Flare

Facility Name: Fiscalini Farms and Fiscalini Dairy Date: March 21, 2016
Mailing Address: 7231 Covert Rd Engineer: Ramon Norman
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Application #: N-6311-9-2 and -10-2
Project #: N-1153078
Deemed Complete: October 23, 2015

I. Proposal

Fiscalini Farms and Fiscalini Dairy has requested Authority to Construct (ATC) permits for a Guascor 1,057 bhp combined heat and power (CHP) digester gas-fired IC engine powering an electrical generator (ATC N-6311-9-2) and a digester gas backup flare (ATC N-6311-10-2) at Fiscalini Farms and Fiscalini Dairy.

ATC Permits N-6311-9-0 and -10-0 for the engine and flare were originally issued on September 21, 2007 under Project N-1072585 and the engine and flare were installed in 2008. ATC Permit N-6311-9-0 required the engine to meet a NO_x emission limit of 9 ppmv @ 15% O₂, which was determined to be Achieved in Practice Best Available Control Technology (BACT) under Project N-1072585. It was subsequently discovered that the dairy digester gas-fired engine on which the emission limit had been based had not been consistently meeting this limit, so the District rescinded the determination that 9 ppmv NO_x @ 15% O₂ was Achieved in Practice BACT for biogas-fired engines. However, the District determined that this emission limit remained technologically feasible if a system was properly designed and built and there was sufficient cleanup of the biogas fuel. To address the applicant's concerns regarding meeting the lower NO_x emissions limit, the ATC permit for the engine was reissued under Project N-1083706 as ATC N-6311-9-1 to incorporate conditions for a flexible BACT emission limit for NO_x that allowed NO_x emissions to exceed 0.15 g-NO_x/bhp-hr (equivalent to 11 ppmv @ 15% O₂), but be no greater than 0.6 g-NO_x/bhp-hr, provided that the other conditions in the ATC were met and satisfactory efforts were made to reduce NO_x emissions to the lowest possible level to satisfy BACT. The engine has now been operating for more than seven years and source tests and District monitoring have demonstrated compliance with the BACT limit for NO_x for several years. However, the digester's internal sulfur removal system has not consistently met the fuel H₂S limit of the permit. SO_x emissions from the engine were monitored as part of a project funded by the California Energy Commission (CEC) (Publication

CEC-500-2015-76, March 2015) and the facility states that they generally found low SO_x emissions even when the H₂S concentrations in the digester gas were very high. The most recent source test performed for the engine on 5/12/2015 also measured low SO_x in the exhaust at 0.86 ppmv @ 15% O₂; however, the sulfur content of the digester gas fuel was not precisely measured at the time of this source test. The applicant postulates that much of the SO_x in the exhaust is not emitted because it reacts with ammonia in the stack to form sulfur particulate that is deposited in the heat recovery boiler. Because the SCR system that was installed has continued to operate effectively through periods of high H₂S concentrations in the digester gas and the facility believes that the majority of SO_x is not emitted, the facility has requested that the H₂S fuel limit be removed under this project and instead replaced with a limit for SO_x in the exhaust. In addition the facility is requesting to change the PM₁₀ limit for the engine from the 0.02 g-PM₁₀/bhp-hr and 0.036 g-PM₁₀/bhp-hr emission limits listed in previous ATCs N-6311-9-0 and N-6311-9-1 to 2.0 lb/day based on the results of a recent source test and to increase the CO limit for the engine to the manufacturer's guaranteed CO emission limit of 2.2 g-CO/bhp-hr.

ATC Permit N-6311-10-0 for the flare included emission factors provided by the flare supplier, a company in Germany. Emissions from the flare were source tested on November 17, 2010. The source tested NO_x emissions from the flare exceeded the NO_x emission factor that was provided by the flare supplier and included in the original ATC permit. ATC Permit N-6311-10-1 was subsequently issued under Project N-1110122 to revise the permitted emission factors to match the source test results. Both ATC permits N-6311-10-0 and -10-1 included conditions limiting the H₂S content of the digester gas flared to no more than 50 ppmv. As explained above, the digester's internal sulfur removal system has not consistently met the H₂S limit of the permits. Therefore, under this project the applicant is proposing to increase the sulfur limit of the digester gas flared to 500 ppmv, which is the maximum digester gas sulfur content the applicant expects from the digester tanks. The flare is considered a control device for the digester and is, therefore, not subject to BACT for SO_x. The NO_x, CO, and VOC emission factors used for the flare will be based on the results of the completed source test. The flare is a backup flare that is used when the engine is not operating and during emergency situations.

Because the previous ATC permits for the engine (N-6311-9-0 & -9-1) and flare (N-6311-10-0 & -10-1) could not be fully implemented, the engine and flare will be treated as new units for purposes of this project. (See Appendix A for Previous ATC Permits)

The project triggers the public notice requirements of District Rule 2201. Therefore, prior to issuance of the ATCs, the preliminary decision for the project will be submitted to the California Air Resources Board (ARB), a public notice will be published in a local newspaper of general circulation in the county of the project, and a 30-day public comment period will be completed.

II. Applicable Rules

Rule 1070	Inspections (12/17/92)
Rule 2201	New and Modified Stationary Source Review Rule (4/21/11)
Rule 2410	Prevention of Significant Deterioration (6/16/11)
Rule 2520	Federally Mandated Operating Permits (6/21/01)
Rule 4101	Visible Emissions (2/17/05)
Rule 4102	Nuisance (12/17/92)

Rule 4201 Particulate Matter Concentration (12/17/92)
Rule 4311 Flares (6/18/09)
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)
40 CFR Part 60, Subpart JJJJ Standards of Performance for Stationary Spark Ignition
Internal Combustion Engines
40 CFR Part 63, Subpart ZZZZ National Emissions Standards for Hazardous Air Pollutants for
Stationary Reciprocating Internal Combustion Engines
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 facility is located at 4848 Jackson Road, Modesto, CA. The equipment is not located within 1,000 feet of the outer boundary of a K-12 school. Therefore, the public notification requirement of California Health and Safety Code 42301.6 is not applicable to this project.

IV. Process Description

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 (VOCs). The gas generated by this process is known as biogas, waste gas, or digester gas. In addition to methane and carbon dioxide, biogas may also contain small amounts of Nitrogen (N₂), Oxygen (O₂), Hydrogen Sulfide (H₂S), and Ammonia (NH₃). Biogas may also include trace amounts of various VOCs that remain from incomplete digestion of the volatile solids in the incoming substrate. Because biogas is mostly composed of methane, the main component of natural gas, the gas produced in the digester can be cleaned to remove H₂S and other impurities and used as fuel.

Digester Gas-Fired IC Engine

The digester gas-fired engine is a Guascor Model SFGLD 560 lean burn engine with a maximum rating of 1,057 bhp that powers an electrical generator rated at 750 kWe. When operating on digester gas, the engine generator set produces a maximum of 710 kWe. The engine is equipped with an SCR system for control of NO_x. H₂S in the digester gas is removed by biological scrubbers contained in the digester tanks. The gas is then sent to the IC engine via plastic piping. Digester gas, which consists mostly of methane, the main component of natural gas, is combusted in the IC engine to produce power. The engine powers an electrical generator that produces power that is sold to a utility (Modesto Irrigation District (MID)). Excess heat from the engine is recovered in order to provide heat for the digester tanks and a

cheese plant located on the dairy. The engine will be permitted to operate up to 24 hr/day and 8,760 hr/year.

Digester Gas-Backup Flare

The IC engine has been sized to use all of the gas produced in the digester tanks. When the engine is not operating or all of the digester gas cannot be used by the IC engine, the gas will be combusted in the backup flare.

V. Equipment Listing

N-6311-9-2: 1,057 BHP GUASCOR MODEL SFGLD-560 DIGESTER GAS-FIRED LEAN-BURN IC ENGINE WITH A SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM POWERING A 750 KW ELECTRICAL GENERATOR

N-6311-10-2: 8,829 FT³/HR (250 M³/HR, 5.3 MMBTU/HR) MUCHE KLÄRANLAGENBAU MODEL FBA 250 SEMI-ENCLOSED BIOGAS FLARE CONTROLLING GAS FROM ANAEROBIC DIGESTER TANKS

VI. Emission Control Technology Evaluation

H₂S Removal in Digester Tanks

The complete mixed anaerobic digester tanks utilize an air injection system for removal of H₂S from the digester gas. The continuous injection of controlled quantities of air in the headspace of the digester tanks increases the amount of oxygen in the digester headspace and in the surface layer of the digester liquid, which facilitates oxidation of sulfides in the digester gas and at the surface of the liquid to elemental sulfur and water. The sulfur dissolves in the liquid in the digester and can be removed from the digester system by deposition and filtration. Injection of air also promotes biological removal of H₂S from the digester gas by facilitating the establishment of sulfur oxidizing microorganisms, such as Thiobacillus species, which have the ability to grow under various environmental conditions and oxidize H₂S to elemental sulfur and sulfates that can be removed from the digester system. Successful installations of the air injection sulfur removal system have demonstrated significantly reduced operation costs when compared to other methods of sulfur removal. The digester tank's air injection system is expected to reduce the sulfur concentration in the digester gas to below 500 ppmv as H₂S.

Digester Gas-Fired IC Engine (N-6311-9-2)

The engine is equipped with the following:

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

The turbocharger reduces NO_x emissions from engines by increasing the efficiency and promoting more complete burning of the fuel.

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 or 90% efficient control device 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, pass 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, water vapor, and other by-products. The use of a catalyst typically reduces the NO_x emissions by up to 90%.

SO_x Removal in the Engine Exhaust

As discussed above, the facility asserts that the majority of SO_x formed during combustion of the digester gas in the engine is not emitted in the exhaust because it reacts with excess ammonia from the SCR system to form sulfur particulate (e.g. ammonium sulfate). When the exhaust is cooled as it passes through the heat recovery boiler, the sulfur particulate is also cooled and adheres to surfaces and is deposited in the heat recovery boiler. This particulate is removed when the heat recovery boiler is periodically cleaned.

Digester Gas Backup Flare (N-6311-10-2)

As discussed above, the gas generated by the digester system is used to fuel the IC engine or combusted in the flare when it is not possible to use all of the gas in the IC engine. Flaring is a rapid oxidation process used to control combustible components, including hydrocarbons and hydrogen sulfide (H₂S), in gases from various processes. Adequate combustion in flares requires sufficient combustion air and proper mixing of air and waste gas. Waste gases containing methane and hydrogen usually burn without smoke. Combustion of the digester gas in flare will convert VOCs present in the gas into carbon dioxide and water.

Because the flare will only be used as a backup unit to combust excess digester gas in rare instances when the engine cannot use all of the gas and also during emergencies, the flare is not served by a separate sulfur removal system. In addition, some emergency situations may require flaring of the gas coming directly from the digester tanks and additional sulfur removal may not be feasible. Therefore, the facility has proposed a digester gas sulfur limit that reflects the maximum sulfur content of the digester gas the applicant expects from the digester tanks.

VII. General Calculations

A. Assumptions

- Because the manure for the digester system will be taken from the liquid manure handling system at Fiscalini Farms and Fiscalini Dairy and the digested solids and effluent from the

digester system will be returned to Fiscalini Farms and Fiscalini Dairy for use, all emissions from the manure processed in the digester system will be allocated to the liquid manure handling system at the dairy.

- The digester system reduces potential VOC emissions from manure generated by the cattle at the dairy. Manure that was previously stored in uncovered lagoon(s) and pond(s) will be placed in the enclosed digester tanks, thereby decreasing volatilization of compounds from the manure. In a digester, most VOCs present will be converted to methane (an exempt compound) and carbon dioxide further reducing the potential for VOC emissions. Because results of dairy digester analyses have indicated very low VOC content (less than 1% by weight), fugitive VOC emissions from the digester system are assumed to be negligible, consistent with District Policy SSP 2015. During operation, the digester gas will be directed to the engine or flare where the gas will be combusted resulting in the oxidation hydrocarbons into carbon dioxide and water. Therefore, VOC emissions from the digester system are considered negligible.
- Molar composition of typical digester gas is about 60% methane and 40% carbon dioxide with trace amounts of hydrogen sulfide, VOC, and other compounds.¹
- Typical Higher Heating Value for Digester Gas: 600 Btu/scf (Per AP-42 (4/00) - notes to Tables Table 3.1-1, Table 3.1-2b, Table 3.1-7, and Table 3.1-8)
- Typical EPA F-factor for Digester Gas: 9,100 dscf/MMBtu (dry, adjusted to 60 °F), (Estimated based on previous digester gas fuel analyses for source tests)
- Molar Specific Volume = 379.5 scf/lb-mol (at 60°F)
- Molecular weights:
NO_x (as NO₂) = 46 lb/lb-mol CO = 28 lb/lb-mol NH₃ = 17 lb/lb-mol
VOC (as CH₄) = 16 lb/lb-mol SO_x (as SO₂) = 64.06 lb/lb-mol

Assumptions for Digester Gas-Fired IC Engine (N-6311-9)

- SO_x emissions (as SO₂) from the engine will be limited to no more than 0.04 g-SO_x/bhp-hr to satisfy BACT (equivalent to the BACT requirement of a fuel gas sulfur content of no more than 40 ppmv as H₂S, as shown in the attached BACT analysis)
- PM₁₀ emissions from the engine will be limited to no more than 2.0 lb/day
- bhp to Btu/hr conversion: 2,545 Btu/hp-hr
- Thermal efficiency of engines: commonly ≈ 33%
- The engine will be permitted to operate 24 hours/day and 365 days per year.

¹ U.S. EPA AgSTAR (<http://www2.epa.gov/agstar>), "Market Opportunities for Biogas Recovery Systems at U.S. Livestock Facilities" (November 2011, <http://www2.epa.gov/agstar/agstar-market-opportunities-report>); American Biogas Council – Frequent Questions (https://www.americanbiogascouncil.org/biogas_questions.asp); "Anaerobic Digestion Overview", David Schmidt, University of Minnesota Department of Biosystems and Agricultural Engineering (<http://www.extension.umn.edu/agriculture/manure-management-and-air-quality/manure-treatment/docs/anaerobic-digestion-overview.pdf>); and "Anaerobic Digestion of Animal Wastes: Factors to Consider", ATTRA - National Sustainable Agriculture Information Service (<https://attra.ncat.org/attra-pub/summaries/summary.php?pub=307>)

Assumptions for Digester Gas-Fired Backup Flare (N-6311-10)

- The digester system backup flare will only be used when the gas cannot be combusted in the engine or in emergency situations.
- The flare will be permitted to operate 24 hours/day and 365 days per year.
- The total amount of gas that can be combusted in the backup flare will be limited to no more than 19.336 MMscf/year, which is equivalent to the flare combusting the maximum rated flow rate of digester gas for 25% of the year. This value is conservative because the backup flare is only used when the engine is not in operation and is subject to the Flare Minimization Plan requirements of District Rule 4311.
- Maximum sulfur content of the digester gas combusted in the backup flare: 500 ppmv as H₂S (per applicant)
- The digester system backup flare is used to control the gas that is generated by the digester system and therefore is exempt from BACT as an emissions control device.

Assumption for PM_{2.5}

- PM_{2.5} emissions from the digester gas-fired engine and flare are assumed to be equal to PM₁₀ emissions.

B. Emission Factors

Emissions Factors for the Digester Gas-Fired IC Engine (N-6311-9-2)

The emission factors for NO_x (0.15 g/bhp-hr), SO_x (0.04 g/bhp-hr), and VOC (0.10 g/bhp-hr) are required to satisfy BACT and have been proposed by the applicant. The CO emission factor (2.2 g/bhp-hr) is the engine manufacturer's guaranteed CO emission factor and has also been proposed by the applicant. The applicant proposed to limit PM₁₀ emissions from the engine to no more than 2.0 lb/day so the engine will not be subject to BACT for PM₁₀. The ammonia emission factor (0.05 g/bhp-hr) was based on the ammonia slip limit of 10 ppmv NH₃ @ 15% O₂. Compliance with the proposed emission factors was demonstrated during recent source tests that measured emissions from the engine. (See Appendix B for Summaries of the 5/12/2015 and 5/20/2014 Engine Source Test Results) The emission factors that will be used for the digester gas-fired IC engine are shown in the table below.

Emission Factors for Digester Gas-Fired Engine				
Pollutant	g/hp-hr	lb/MMBtu	ppmvd (@ 15%O ₂)	Source
NO _x	0.15	0.0429	11 ppmvd	BACT Requirement/Proposed by Applicant – See equation on Page 8 below
SO _x	0.04	0.0114	2.1 ppmvd	BACT Requirement – See equation on Page 8 below
PM ₁₀	2.0 lb/day			Proposed by Applicant to remain under the BACT applicability threshold
CO	2.2	0.629	265 ppmvd	Proposed by Applicant – See equation on Page 8 below
VOC	0.10	0.0286	21 ppmvd as CH ₄	BACT Requirement/Proposed by Applicant – See equation on Page 8 below
NH ₃	0.05	0.0144	10 ppmvd	Required/Proposed – See equation on Page 8 below

NO_x – 0.15 g/bhp-hr

$$0.15 \frac{\text{g NO}_x}{\text{bhp - hr}} \times \frac{1 \text{ lb}}{453.59 \text{ g}} \times \frac{1 \text{ hp - hr}}{2,545 \text{ Btu}} \times \frac{0.33 \text{ Btu}_{\text{out}}}{1 \text{ Btu}_{\text{in}}} \times \frac{10^6 \text{ Btu}}{1 \text{ MMBtu}} = 0.0429 \frac{\text{lb NO}_x}{\text{MMBtu}}$$

$$0.0429 \frac{\text{lb NO}_x}{\text{MMBtu}} \times \frac{(20.9 - 15)\% \text{ O}_2}{20.9\% \text{ O}_2} \times \frac{1 \text{ MMBtu}}{9,100 \text{ ft}^3} \times \frac{379.5 \text{ ft}^3}{\text{lb - mole}} \times \frac{\text{lb - mole}}{46 \text{ lb NO}_x} \times \frac{10^6 \text{ ppmv}}{1} = 11 \text{ ppmvd NO}_x \text{ @ } 15\% \text{ O}_2$$

SO_x – 0.04 g/bhp-hr

$$0.04 \frac{\text{g SO}_x}{\text{bhp - hr}} \times \frac{1 \text{ lb}}{453.59 \text{ g}} \times \frac{1 \text{ hp - hr}}{2,545 \text{ Btu}} \times \frac{0.33 \text{ Btu}_{\text{out}}}{1 \text{ Btu}_{\text{in}}} \times \frac{10^6 \text{ Btu}}{1 \text{ MMBtu}} = 0.0114 \frac{\text{lb SO}_x}{\text{MMBtu}}$$

$$0.0114 \frac{\text{lb SO}_x}{\text{MMBtu}} \times \frac{(20.9 - 15)\% \text{ O}_2}{20.9\% \text{ O}_2} \times \frac{1 \text{ MMBtu}}{9,100 \text{ ft}^3} \times \frac{379.5 \text{ ft}^3}{\text{lb - mole}} \times \frac{\text{lb - mole}}{64.06 \text{ lb SO}_x} \times \frac{10^6 \text{ ppmv}}{1} = 2.1 \text{ ppmvd SO}_x \text{ @ } 15\% \text{ O}_2$$

CO – 2.2 g/bhp-hr

$$2.2 \frac{\text{g CO}}{\text{bhp - hr}} \times \frac{1 \text{ lb}}{453.59 \text{ g}} \times \frac{1 \text{ hp - hr}}{2,545 \text{ Btu}} \times \frac{0.33 \text{ Btu}_{\text{out}}}{1 \text{ Btu}_{\text{in}}} \times \frac{10^6 \text{ Btu}}{1 \text{ MMBtu}} = 0.629 \frac{\text{lb CO}}{\text{MMBtu}}$$

$$0.629 \frac{\text{lb CO}}{\text{MMBtu}} \times \frac{(20.9 - 15)\% \text{ O}_2}{20.9\% \text{ O}_2} \times \frac{1 \text{ MMBtu}}{9,100 \text{ ft}^3} \times \frac{379.5 \text{ ft}^3}{\text{lb - mole}} \times \frac{\text{lb - mole}}{28 \text{ lb CO}} \times \frac{10^6 \text{ ppmv}}{1} = 265 \text{ ppmvd CO @ } 15\% \text{ O}_2$$

VOC – 0.10 g/bhp-hr

$$0.10 \frac{\text{g VOC}}{\text{bhp - hr}} \times \frac{1 \text{ lb}}{453.59 \text{ g}} \times \frac{1 \text{ hp - hr}}{2,545 \text{ Btu}} \times \frac{0.33 \text{ Btu}_{\text{out}}}{1 \text{ Btu}_{\text{in}}} \times \frac{10^6 \text{ Btu}}{1 \text{ MMBtu}} = 0.0286 \frac{\text{lb VOC}}{\text{MMBtu}}$$

$$0.0286 \frac{\text{lb VOC}}{\text{MMBtu}} \times \frac{(20.9 - 15)\% \text{ O}_2}{20.9\% \text{ O}_2} \times \frac{1 \text{ MMBtu}}{9,100 \text{ ft}^3} \times \frac{379.5 \text{ ft}^3}{\text{lb - mole}} \times \frac{\text{lb - mole}}{16 \text{ lb VOC}} \times \frac{10^6 \text{ ppmv}}{1} = 21 \text{ ppmvd VOC @ } 15\% \text{ O}_2$$

NH₃ – 10 ppmvd @ 15% O₂ in exhaust

$$\frac{10 \text{ ppmvd NH}_3}{10^6} \times \frac{17 \text{ lb NH}_3}{\text{lb - mole}} \times \frac{\text{lb - mole}}{379.5 \text{ ft}^3} \times \frac{9,100 \text{ ft}^3}{\text{MMBtu}} \times \frac{20.9\% \text{ O}_2}{(20.9 - 15)\% \text{ O}_2} = 0.0144 \frac{\text{lb NH}_3}{\text{MMBtu}}$$

$$0.0144 \frac{\text{lb NH}_3}{\text{MMBtu}} \times \frac{1 \text{ MMBtu}}{10^6 \text{ Btu}} \times \frac{\text{Btu}_{\text{in}}}{0.33 \text{ Btu}_{\text{out}}} \times \frac{2,545 \text{ Btu}}{\text{hp - hr}} \times \frac{453.59 \text{ g}}{\text{lb}} = 0.05 \frac{\text{g NH}_3}{\text{bhp - hr}}$$

Emission Factors for the Digester System Backup Flare (N-6311-10)

The emission factors for NO_x (0.047 lb/MMBtu), CO (0.003 lb/MMBtu), and VOC (0.003 lb/MMBtu) for the digester system backup flare are based on the highest test run from the 11/17/10 source test performed to measure emissions from the flare with an additional compliance margin of approximately 10%. (See Appendix C for a Summary of the 11/17/2010 Flare Source Test Results) The SO_x emission factor (8.44 x 10⁻⁵ lb/scf or 0.141 lb/MMBtu) is based on the maximum sulfur content of the dairy digester gas proposed by the applicant (500 ppmv as H₂S). The emission factor for PM (0.015 lb/MMBtu) is based on the value given for landfill gas-fired flares in AP-42, Draft Section 2.4 Municipal Solid Waste Landfills (October 2008).

It is reasonable to use the AP-42 PM emission factor for landfill gas-fired flares for the digester gas flare because landfill gas and digester gas are both types of biogas, so they are expected to have similar 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 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; however, some PM becomes entrained in landfill gas as it travels through the landfill gas collection system to the combustion device, whereas the chance of PM becoming entrained in the digester gas after collection from a digester system is generally insignificant.

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

Emissions Factors for Digester System Backup Flare (N-6311-10)			
Pollutant	lb/MMBtu	lb/scf*	Source
NO _x	0.047	2.82 x 10 ⁻⁵	Highest Run from 11/17/2010 Flare Source Test & 10% Compliance Margin
SO _x	0.141	8.44 x 10 ⁻⁵	500 ppmvd in fuel gas (Proposed by Applicant)
PM ₁₀	0.015	9.0 x 10 ⁻⁶	AP-42 Draft Table 2.4.3 (October 2008) (Value for Landfill Gas Flares)
CO	0.003	1.8 x 10 ⁻⁶	Highest Run from 11/17/2010 Flare Source Test & 10% Compliance Margin
VOC	0.003	1.8 x 10 ⁻⁶	Highest Run from 11/17/2010 Flare Source Test & 10% Compliance Margin

*lb/scf equivalent equals lb/MMBtu x 0.0006 MMBtu/scf
 **Example calculation of SO_x emission factors shown below

SO_x – 500 ppmvd H₂S in fuel gas

$$\frac{500 \text{ ft}^3 \text{ H}_2\text{S}}{10^6 \text{ ft}^3} \times \frac{32.06 \text{ lb S}}{\text{lb - mol H}_2\text{S}} \times \frac{\text{lb - mole}}{379.5 \text{ ft}^3} \times \frac{64.06 \text{ lb SO}_2}{32.06 \text{ lb S}} \times \frac{\text{ft}^3}{600 \text{ Btu}} \times \frac{10^6 \text{ Btu}}{\text{MMBtu}} = 0.141 \frac{\text{lb SO}_x}{\text{MMBtu}}$$

C. Calculations

1. Pre-Project Potential to Emit (PE1)

Since the digester gas-fueled IC engine and digester system backup flare are being treated as new emissions units, PE1 = 0 for all affected pollutants.

2. Post Project Potential to Emit (PE2)

Digester Gas-Fired IC Engine (N-6311-9-2)

Daily PE for Engine N-6311-9-2								
NO _x	0.15	(g/hp-hr) x	1,057	(hp) x	24	(hr/day) ÷ 453.59 (g/lb) =	8.4	(lb/day)
SO _x	0.04	(g/hp-hr) x	1,057	(hp) x	24	(hr/day) ÷ 453.59 (g/lb) =	2.2	(lb/day)
PM ₁₀	-						2.0	(lb/day)
CO	2.2	(g/hp-hr) x	1,057	(hp) x	24	(hr/day) ÷ 453.59 (g/lb) =	123.0	(lb/day)
VOC	0.10	(g/hp-hr) x	1,057	(hp) x	24	(hr/day) ÷ 453.59 (g/lb) =	5.6	(lb/day)
NH ₃	0.05	(g/hp-hr) x	1,057	(hp) x	24	(hr/day) ÷ 453.59 (g/lb) =	2.8	(lb/day)

Annual PE for Engine N-6311-9-2								
NO _x	0.15	(g/hp-hr) x	1,057	(hp) x	8,760	(hr/yr) ÷ 453.59 (g/lb) =	3,062	(lb/yr)
SO _x	0.04	(g/hp-hr) x	1,057	(hp) x	8,760	(hr/yr) ÷ 453.59 (g/lb) =	817	(lb/yr)
PM ₁₀	2.0	lb/day x			365	day/yr =	730	(lb/yr)
CO	2.2	(g/hp-hr) x	1,057	(hp) x	8,760	(hr/yr) ÷ 453.59 (g/lb) =	44,910	(lb/yr)
VOC	0.10	(g/hp-hr) x	1,057	(hp) x	8,760	(hr/yr) ÷ 453.59 (g/lb) =	2,041	(lb/yr)
NH ₃	0.05	(g/hp-hr) x	1,057	(hp) x	8,760	(hr/yr) ÷ 453.59 (g/lb) =	1,021	(lb/yr)

Digester System Backup Flare (N-6311-10-2)

As explained above, the digester system is composed of enclosed tanks that will reduce VOC emissions from the manure and will have negligible fugitive emissions; therefore, emissions for the digester will be calculated only based on combustion of the digester gas in the backup flare.

The potential to emit for the backup flare will be calculated based on the maximum flare rating 8,829 scf/hr and operation of the flare for up to 24 hours per day (211,896 scf per day) and the annual limit of 19.336 MMscf/yr of digester gas combusted in the flare.

Daily PE2 for the Digester System Backup Flare (N-6311-10-2)							
Pollutant	Emission Factor (lb/scf)	x	Gas Flow Rate (scf/hr)	x	Daily Hours of Operation (hrs/day)	=	PE2 (lb/day)
NO _x	2.82E-5	x	8,829	x	24	=	6.0
SO _x	8.44E-5	x	8,829	x	24	=	17.9
PM ₁₀	9.0E-6	x	8,829	x	24	=	1.9
CO	1.8E-6	x	8,829	x	24	=	0.4
VOC	1.8E-6	x	8,829	x	24	=	0.4

Annual PE2 for the Digester System Backup Flare (N-6311-10-2)							
Pollutant	Emission Factor (lb/scf)	x	Maximum Gas Flared Annually (MMscf/yr)	x	10 ⁶ scf/MMscf	=	PE2 (lb/yr)
NO _x	2.82E-5	x	19.336	x	10 ⁶	=	545
SO _x	8.44E-5	x	19.336	x	10 ⁶	=	1,632
PM ₁₀	9.0E-6	x	19.336	x	10 ⁶	=	174
CO	1.8E-6	x	19.336	x	10 ⁶	=	35
VOC	1.8E-6	x	19.336	x	10 ⁶	=	35

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.

SSPE1 (lb/year)						
Permit Unit	NO _x	SO _x	PM ₁₀	CO	VOC	NH ₃
N-6311-1-2 (Milking Operation)*	0	0	0	0	640	304
N-6311-2-2 (Cow Housing)*	0	0	26,252	0	23,873	114,450
S-5834-3-3 (Liquid Manure Handling)*	0	0	0	0	5,804	36,743
N-6311-4-2 (Solid Manure Handling)*	0	0	0	0	1,160	7,346
N-6311-5-0 (315 bhp Emergency IC Engine)	694	0	33	211	79	0
N-6311-6-0 (1,000 Gallon Gasoline Dispensing Operation)**	0	0	0	0	97	0
N-6311-7-0 (1,000 Gallon Gasoline Dispensing Operation)**	0	0	0	0	14	0
N-6311-8-1 (Feed Storage & Handling)*	0	0	0	0	49,736	0
N-6311-11-0 (Anaerobic Digester Tanks)	0	0	0	0	0	0
SSPE1	694	0	26,285	211	81,403	158,843

* PE for PM₁₀ & VOC for N-6311-1-2, -2-2, -3-2, -4-2, & -8-1 taken from Project N-1110969

** PE for N-6311-6-0 & -7-0 taken from Project N-1063452

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.

Permit Unit	SSPE2 (lb/year)					
	NO _x	SO _x	PM ₁₀	CO	VOC	NH ₃
N-6311-1-2 (Milking Operation)*	0	0	0	0	640	304
N-6311-2-2 (Cow Housing)*	0	0	26,252	0	23,873	114,450
S-5834-3-3 (Liquid Manure Handling)*	0	0	0	0	5,804	36,743
N-6311-4-2 (Solid Manure Handling)*	0	0	0	0	1,160	7,346
N-6311-5-0 (315 bhp Emergency IC Engine)	694	0	33	211	79	0
N-6311-6-0 (1,000 Gallon Gasoline Dispensing Operation)**	0	0	0	0	97	0
N-6311-7-0 (1,000 Gallon Gasoline Dispensing Operation)**	0	0	0	0	14	0
N-6311-8-1 (Feed Storage & Handling)*	0	0	0	0	49,736	0
ATC N-6311-9-2 (1,057 bhp Digester Gas Engine)	3,062	817	730	44,910	2,041	1,021
N-6311-10-2 (Digester System Backup Flare)	545	1,632	174	35	35	0
N-6311-11-0 (Anaerobic Digester Tanks)	0	0	0	0	0	0
SSPE2	4,301	2,449	27,189	45,156	83,479	159,864

* PE for PM₁₀ & VOC for N-6311-1-2, -2-2, -3-2, -4-2, & -8-1 taken from Project N-1110969

** PE for N-6311-6-0 & -7-0 taken from Project N-1063452

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

As mentioned above and pursuant to District Rule 2201, fugitive emissions are not counted when determining if a facility is a major source unless the facility belongs to

one of the specific source categories identified in the major source definition in 40 CFR Part 70.2, or when determining if a stationary source is a major air toxics source. 40 CFR 70.2 (Definitions, Major Source (2)) states the following:

(2) A major stationary source of air pollutants, as defined in section 302 of the Act, that directly emits, or has the potential to emit, 100 tpy or more of any air pollutant subject to regulation (including any major source of fugitive emissions of any such pollutant, as determined by rule by the Administrator). The fugitive emissions of a stationary source shall not be considered in determining whether it is a major stationary source for the purposes of section 302(j) of the Act, unless the source belongs to one of the following categories of stationary source: (i) Coal cleaning plants (with thermal dryers); (ii) Kraft pulp mills; (iii) Portland cement plants; (iv) Primary zinc smelters; (v) Iron and steel mills; (vi) Primary aluminum ore reduction plants; (vii) Primary copper smelters; (viii) Municipal incinerators capable of charging more than 250 tons of refuse per day; (ix) Hydrofluoric, sulfuric, or nitric acid plants; (x) Petroleum refineries; (xi) Lime plants; (xii) Phosphate rock processing plants; (xiii) Coke oven batteries; (xiv) Sulfur recovery plants; (xv) Carbon black plants (furnace process); (xvi) Primary lead smelters; (xvii) Fuel conversion plants; (xviii) Sintering plants; (xix) Secondary metal production plants; (xx) Chemical process plants—The term chemical processing plant shall not include ethanol production facilities that produce ethanol by natural fermentation included in NAICS codes 325193 or 312140; (xxi) Fossil-fuel boilers (or combination thereof) totaling more than 250 million British thermal units per hour heat input; (xxii) Petroleum storage and transfer units with a total storage capacity exceeding 300,000 barrels; (xxiii) Taconite ore processing plants; (xxiv) Glass fiber processing plants; (xxv) Charcoal production plants; (xxvi) Fossil-fuel-fired steam electric plants of more than 250 million British thermal units per hour heat input; or (xxvii) Any other stationary source category, which as of August 7, 1980 is being regulated under section 111 or 112 of the Act.

Because agricultural operations do not fall under any of the specific source categories listed above, fugitive emissions are not counted when determining if an agricultural operation is a major source. 40 CFR 70.2 defines fugitive emissions as “those emissions which could not reasonably pass through a stack, chimney, vent, or other functionally-equivalent opening.”

Since emissions at the dairy are not actually collected, a determination of whether emissions could be reasonably collected must be made by the permitting authority. The California Air Pollution Control Association (CAPCOA) prepared guidance in 2005 for estimating potential to emit of VOC from dairy farms. The guidance states that “VOC emissions from the milking centers, cow housing areas, corrals, common manure storage areas, and land application of manure are not physically contained and could not reasonably pass through a stack, chimney, vent, or other functionally-equivalent opening. No collection technologies currently exist for VOC emissions from these emissions units. Therefore, the VOC emissions from these sources are considered fugitive.” The guidance also concludes that, because VOC collection technologies do exist for liquid waste systems at dairies, “... the VOC emissions from waste lagoons and storage ponds are considered non-fugitive.” The District concurs with the CAPCOA assessment. Therefore, the emissions from the milking operation, cow housing units,

solid manure storage areas, land application, and feed storage and handling are considered fugitive. The District has determined that control technology to capture emissions from lagoons (biogas collection systems, for instance) is in use and these emissions can be reasonably collected and are not fugitive. Therefore, only emissions from the lagoons/storage ponds, IC engines, gasoline storage tanks, and flare will be used to determine if this facility is a major source.

The non-fugitive emissions from the dairy lagoons/storage were calculated in Project N-1110969. The following table shows the non-fugitive Stationary Source Potential to Emit for the facility.

Rule 2201 Major Source Determination (lb/year)						
	NO _x	SO _x	PM ₁₀	PM _{2.5}	CO	VOC
Non-Fugitive SSPE1	694	0	33	33	211	2,991
Non-Fugitive SSPE2	4,301	2,449	937	937	45,156	5,067
Major Source Threshold	20,000	140,000	140,000	200,000*	200,000	20,000
Major Source?	No	No	No	No	No	No

* The application for this project was deemed complete before 2/18/2016, which was when the District's PM2.5 Major Source Threshold was lowered to 140,000 lb/year

Note: Non-Fugitive PM2.5 assumed to be equal to PM10

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)						
	NO ₂	VOC	SO ₂	CO	PM	PM ₁₀
Estimated Facility PE before Project Increase	0.3	1.5	0	0.1	0.0	0.0
PSD Major Source Thresholds	250	250	250	250	250	250
PSD Major Source ? (Y/N)	N	N	N	N	N	N

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.

Since the digester gas-fueled engine and digester gas backup flare are treated as new emissions units, BE = PE1 = 0 for all pollutants from each unit.

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. Additionally, since the facility is not a major source for PM₁₀ (140,000 lb/year), it is not a major source for PM_{2.5} (200,000 lb/year since the application for the project was deemed complete before 2/18/2016).

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
- Hydrogen sulfide (H₂S)²
- Total reduced sulfur (including H₂S)²

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)						
	NO ₂	VOC	SO ₂	CO	PM	PM10
Total PE from New and Modified Units	1.8	1.0	1.2	22.5	0.5	0.5
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. Detailed QNEC calculations are included in Appendix D.

² Because the facility is not included in the specific source categories listed in 40 CFR 51.165, for PSD purposes only non-fugitive emissions from the engine exhaust stack and flare must be addressed for this project. Although the sulfur (primarily H₂S) in the fuel will be converted almost entirely to SO_x during combustion, the maximum possible amount of H₂S and total reduced sulfur compounds from the engine stack and flare can be calculated by assuming that all sulfur in the fuel is emitted as H₂S. Based on the maximum digester gas sulfur limit of 500 ppmv as H₂S proposed by the applicant, the maximum possible H₂S emission factors for the engine and flare are calculated to be 0.25 g-H₂S/bhp (0.0704 lb-H₂S/MMBtu) and 4.22 x 10⁻⁵ lb- H₂S/scf, respectively, resulting in a total combined maximum of < 3.0 tpy H₂S from the exhaust stack of the engine and the flare. This is well below the applicable PSD threshold of 250 tpy.

VIII. Compliance

Rule 1070 Inspections

This rule applies to any source operation, which emits or may emit air contaminants. This rule allows the District to perform inspections for the purpose of obtaining information necessary to determine whether air pollution sources are in compliance with applicable rules and regulations. The rule also allows the District to require record keeping, to make inspections and to conduct tests of air pollution sources.

The following conditions will be listed on each permit to ensure compliance:

- {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]
- {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]

Rule 2201 New and Modified Stationary Source Review Rule

A. Best Available Control Technology (BACT)

1. BACT Applicability

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 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

N-6311-9-2: Digester Gas-Fired IC Engine

As seen in Section VII.C.2 above, the applicant has installed one digester gas-fired IC engine with a PE greater than 2.0 lb/day for NO_x, SO_x, CO, and VOC. Therefore,

BACT is triggered for NO_x, SO_x, and VOC. As part of the BACT requirements, NH₃ slip from the SCR system will also be limited. Although the PE for CO from the unit also exceeds 2.0 lb/day, BACT is not triggered for CO since the SSPE2 for CO is not greater than 200,000 lbs/year, as demonstrated in Section VII.C.5 above.

N-6311-10-2: Anaerobic Digester System Backup Flare

The applicant has also installed a digester gas-fired backup flare, with a PE greater than 2.0 lb/day for NO_x and SO_x. However, the flare is an emissions control device used to control gas from the digester system. The District has determined that an emissions control device is not an emissions unit that is subject to BACT. Therefore, the digester gas-fired backup flare is not subject to District BACT requirements.

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 for relocation of an emissions unit.

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 for modification of a unit.

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 or Federal Major Modification. Therefore BACT is not triggered for Major Modification purposes.

2. BACT Guideline

N-6311-9-2: Digester Gas-Fired IC Engine

BACT Guideline 3.3.15 applies to the digester gas-fired IC engine. (See Appendix E)

N-6311-10-2: Anaerobic Digester System Backup Flare

As discussed above, the flare is used to control the digester gas that is generated by the digester system and therefore is an emission control device that is not subject to District BACT requirements. Although the flare is not subject to District BACT requirements, the flare will operate with NO_x emissions not exceeding 0.06 lb/MMBtu and will be subject to a 10% opacity limit to ensure operation with minimal smoke and PM emissions. Therefore, the flare is a well-controlled flare that will minimize the generation of pollutants not directly controlled by the flare.

3. Top-Down BACT Analysis

N-6311-9-2: Digester Gas-Fired IC Engine

Pursuant to the Top-Down BACT Analysis (See Appendix E), BACT has been satisfied with the following:

- NO_x: NO_x emissions ≤ 0.15 g/bhp-hr
- SO_x: SO_x emissions ≤ 0.04 g/bhp-hr (equivalent to 40 ppmv sulfur as H₂S in digester gas fuel)
- VOC: VOC emissions ≤ 0.10 g/bhp-hr
- NH₃: NH₃ slip emissions ≤ 10 ppmv @ 15% O₂

B. Offsets

Pursuant to Section 4.6.9 of District Rule 2201, agricultural sources that are not major sources are exempt from offsets. As demonstrated in Section VII.C.5 above, this facility is not a major source. Therefore, this dairy source is exempt from offsets.

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, and/or
- d. Any project with an SSIPE of greater than 20,000 lb/year for any pollutant.
- 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 above, 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.

As demonstrated in Sections VII.C.7 and VII.C.8, this project does not constitute an SB 288 or Federal Major Modification; therefore, public noticing for SB 288 or Federal Major Modification purposes is not required.

b. PE > 100 lb/day

Applications which include a new emissions unit with a PE greater than 100 pounds during any one day for any pollutant will trigger public noticing requirements.

The daily PE2 for the Digester Gas-Fired IC Engine and Digester Gas Backup Flare are compared to the daily PE Public Notice thresholds in the following tables:

Digester Gas-Fired IC Engine (N-6311-9-2)

PE > 100 lb/day Public Notice Thresholds			
Pollutant	PE2 (lb/day)	Public Notice Threshold	Public Notice Triggered?
NO _x	8.4	100 lb/day	No
SO _x	2.2	100 lb/day	No
PM ₁₀	2.0	100 lb/day	No
CO	123.0	100 lb/day	Yes
VOC	5.6	100 lb/day	No
NH ₃	2.8	100 lb/day	No

Therefore, public noticing for PE > 100 lb/day purposes is required for the digester gas-fired IC engine.

Digester Gas-Fired IC Backup Flare (N-6311-10-2)

PE > 100 lb/day Public Notice Thresholds			
Pollutant	PE2 (lb/day)	Public Notice Threshold	Public Notice Triggered?
NO _x	6.0	100 lb/day	No
SO _x	17.9	100 lb/day	No
PM ₁₀	1.9	100 lb/day	No
CO	0.4	100 lb/day	No
VOC	0.4	100 lb/day	No

Therefore, public noticing for PE > 100 lb/day purposes is not required for the digester backup flare.

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	694	4,301	20,000 lb/year	No
SO _x	0	2,449	54,750 lb/year	No
PM ₁₀	26,285	27,189	29,200 lb/year	No
CO	211	45,156	200,000 lb/year	No
VOC	81,403	83,479	20,000 lb/year	No

As detailed 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	4,301	694	3,607	20,000 lb/year	No
SO _x	2,449	0	2,449	20,000 lb/year	No
PM ₁₀	27,189	26,285	904	20,000 lb/year	No
CO	45,156	211	44,945	20,000 lb/year	Yes
VOC	83,479	81,403	2,076	20,000 lb/year	No
NH ₃	159,864	158,843	1,021	20,000 lb/year	No

As demonstrated above, the SSIPE for CO was greater than 20,000 lb/year; therefore public noticing for SSIPE > 20,000 lbs is required.

e. Title V Significant Permit Modification

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

2. Public Notice Action

As discussed above, public noticing is required for this project for CO emissions from an emissions unit in excess of 100 lb/day and for an SSIPE for CO that exceeds 20,000 lb/yr. Therefore, public notice documents will be submitted to the California Air Resources Board (ARB) and a public notice will be published in a local newspaper of general circulation prior to the issuance of the ATC permits 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.

Proposed Rule 2201 (DEL) Conditions for the Digester Gas-Fired Engine (N-6311-9-2)

For the digester gas-fired IC engine, the DELs are stated in the form of emission factors (g/hp-hr & ppmv), the maximum engine horsepower rating (1,057 bhp), and the maximum operational time of 24 hours per day.

- Emissions from this IC engine shall not exceed any of the following limits: 0.15 g-NO_x/bhp-hr (for periodic alternate monitoring, equivalent to 11 ppmvd NO_x @ 15% O₂), NO_x referenced as NO₂; 2.2 g-CO/bhp-hr (for periodic alternate monitoring, equivalent to 265 ppmvd CO @ 15% O₂); 0.10 g-VOC/bhp-hr (for periodic alternate monitoring, equivalent to 21 ppmvd VOC @ 15% O₂), VOC referenced as methane. [District Rules 2201 and 4702]
- SO_x emissions from this IC engine shall not exceed 2.1 ppmvd @ 15% O₂, or shall not exceed 2.0 lb/day. SO_x concentrations in the exhaust will be determined as the sum of the measured SO₂ and SO₃ concentrations. [District Rules 2201 and 4801]
- PM₁₀ emissions from this IC engine shall not exceed 2.0 lb/day. [District Rule 2201]
- Ammonia (NH₃) emissions from this engine shall not exceed 10 ppmvd @ 15% O₂. [District Rules 2201 and 4102]

Proposed Rule 2201 (DEL) Conditions for the Digester Backup Flare (N-6311-10-2)

For the digester gas-fired flare, the DELs for NO_x, PM₁₀, CO, and VOC are stated in the form of maximum emission factors (lb/MMBtu) and maximum amount of gas that can be combusted (MMscf). The DEL for SO_x is based on the maximum sulfur content of the digester gas.

- No air contaminant shall be discharged into the atmosphere from the flare for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1/2 or 10% opacity. [District Rules 2201 and 4101]
- Only digester gas shall be combusted in the flare. [District Rule 2201]
- Emissions from the flare shall not exceed any of the following limits: 0.047 lb-NO_x/MMBtu, 0.015 lb-PM₁₀/MMBtu, 0.003 lb-CO/MMBtu, and 0.003 lb-VOC/MMBtu. [District Rule 2201]
- The sulfur content of the digester gas flared shall not exceed 500 ppmv as H₂S. [District Rules 2201 and 4801]
- The amount of digester gas combusted in the flare shall not exceed the following limits: 0.2119 MMscf (or 127.14 MMBtu) in any one day and 19.336 MMscf (or 11,601.6 MMBtu) in any consecutive 365-day period. [District Rule 2201]

E. Compliance Assurance

1. Source Testing

Digester Gas-Fired IC Engine (N-6311-9-2)

The 1,057 bhp digester gas-fired engine is subject to District Rule 4702 - Internal Combustion Engines. The District has determined that biogas-fueled IC engines at agricultural facilities that are operated by the agricultural facility and fueled with biogas generated at the agricultural facility are agricultural IC 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 with the more stringent Rule 2201 NSR emission limits that apply, District practice and the draft District Source Test Policy (APR 1705) requires source testing for NO_x, CO, and VOC from digester gas fired IC engines served by catalytic control systems (including SCR systems and/or oxidation catalysts) shall be conducted initially and at least once every 24 months thereafter. Because the Rule 2201 NSR emission limits with which the digester gas-fired IC engine must comply are much more stringent than the Rule 4702 emission limits for spark-ignited agricultural IC engines and also because the quality of digester gas is not as consistent as other fuels, the more frequent source testing requirement from the District's practice and draft policy will be required to ensure compliance. As noted above, emissions from the engine have previously been tested (See Appendix B). Therefore, source testing for NO_x, CO, and VOC will be required at least once every 24 months. Since the control equipment will include an SCR system, periodic testing of ammonia slip will also be required.

As explained above, the applicant has requested that the digester gas fuel sulfur limit be removed under this project and instead replaced with a limit for SO_x in the exhaust. Therefore, source testing to measure the SO_x emissions in the exhaust will also be required at least once at least once every 24 months. Analysis of the sulfur content of the digester gas will also be required whenever SO_x emissions in the exhaust are measured to document how the sulfur content of the fuel affects emissions. In addition, to ensure compliance with the proposed PM₁₀ limit of 2.0 lb/day, testing of PM₁₀ emissions will also be required at least once every 24 months.

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

- Source testing to measure NO_x, CO, VOC, SO_x, PM₁₀, and ammonia (NH₃) emissions from this unit shall be conducted at least once every 24 months. [District Rules 1081, 2201, and 4702]
- {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 30-consecutive-minute test runs shall apply. 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 methane. NO_x, CO, VOC, SO_x, and NH₃ concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rules 2201 and 4702]

- The following methods shall be used for source testing: NO_x (ppmv) - EPA Method 7E or ARB Method 100; CO (ppmv) - EPA Method 10 or ARB Method 100; VOC (ppmv) - EPA Method 18, 25A or 25B, or ARB Method 100; stack gas oxygen - EPA Method 3 or 3A or ARB Method 100; 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, or ARB Method 5 in combination with Method 501; NH₃ - BAAQMD ST-1B or SCAQMD Method 207-1. Alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702]
- In lieu of performing a source test for PM₁₀, the results of a total particulate test may be used for compliance with the PM₁₀ limit provided the results include both the filterable and condensable (back half) particulate, and that all particulate matter is assumed to be PM₁₀. [District Rules 1081 and 2201]
- The following methods shall be used for source testing of SO_x emissions: SO₂ (ppmv) - EPA Method 6, EPA Method 6C, EPA Method 8, or ARB Method 100; SO₃ - EPA Method 8, EPA Method 8A, EPA Conditional Test Method (CTM) 13A, or National Council for Air and Stream Improvement, Inc. (NCASI) Method 8A. SO_x concentrations in the exhaust will be determined as the sum of the measured SO₂ and SO₃ concentrations. [District Rules 1081 and 2201]
- Fuel sulfur content analysis shall be performed at least once every 24 months using EPA Method 11 or EPA Method 15, as appropriate. Fuel samples shall be taken and analyzed for fuel sulfur content whenever SO_x emissions from this unit are source tested. Records of the fuel sulfur analysis shall be maintained and provided to the District upon request. [District Rule 2201]
- Source testing shall be witnessed or authorized by the District, and samples shall be collected by a California Air Resources Board certified testing laboratory. [District Rule 1081]
- {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 within 60 days after completion of the source test. [District Rule 1081]

Digester System Backup Flare (N-6311-10-2)

Emissions from the flare have previously been tested (See Appendix C) and the flare demonstrated compliance with the proposed emission limits. Source testing of this unit is not required to demonstrate compliance with the Rule 2201 emission limits for NO_x, PM₁₀, CO, or VOC. However, periodic testing of the fuel sulfur content of the digester gas will be required to ensure compliance with the digester gas fuel sulfur content limit.

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

- Digester gas sulfur content analysis shall be performed at least once every 12 months 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]

2. Monitoring

Digester Gas-Fired IC Engine (N-6311-9-2)

As stated above the engine is subject to District Rule 4702. Section 5.9.5 of District Rule 4702 requires monitoring of NO_x emissions at least once every 24 months for an agricultural spark-ignited IC engine. However, because the Rule 2201 NSR emission limits with which the digester gas-fired IC engine must comply are much more stringent than the Rule 4702 emission limits for spark-ignited agricultural IC engines and also because the potential variability of the digester gas fuel, monitoring of the emissions once every 24 months would not be sufficient to ensure compliance with the emission limits in the proposed ATC permit and more frequent monitoring is required. Therefore, quarterly monitoring of NO_x, CO, and O₂ concentrations in accordance with pre-approved alternate monitoring plan "A" within District Policy SSP 1810 will be required. Since the engine will be equipped with SCR, quarterly monitoring of ammonia slip will also be required.

As explained above, the applicant has requested that the permit for the digester gas-fueled IC engine include a limit for SO_x in the exhaust rather than limiting the sulfur content of the digester gas fuel. Therefore, periodic monitoring of SO₂ in the exhaust will be required to ensure ongoing compliance with the limit for SO_x in the exhaust.

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

- The permittee shall monitor and record the stack concentration of NO_x, CO, O₂, and SO₂ at least once every calendar quarter (in which a source test is not performed) using a portable emission monitor that meets District specifications (or other District-approved method for SO₂/SO_x). [In-stack monitors may be allowed if they satisfy the standards for portable analyzers as specified in District policies and are approved in writing by the APCO.] Monitoring shall be performed not less than once every month for 12 months if two 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 Rules 2201 and 4702]
- 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. [District Rules 2201 and 4102]

- If the NO_x, CO, SO₂, or NH₃ concentrations corrected to 15% O₂, as measured by the portable analyzer or the District-approved ammonia monitoring equipment, exceed the respective allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours of operation after detection. If the portable analyzer or ammonia monitoring equipment readings continue to exceed the allowable emissions concentration after 8 hours of operation after detection, 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 the performing the notification and testing required by this condition. SO₂ concentrations measured at times that SO₂/SO_x emissions are demonstrated not to exceed 2.0 lb/day based on the engine operating load or exhaust flow rate are not subject to the requirements in this condition to conduct a source test or stipulate that an emissions violation has occurred. [District Rules 2201 and 4702]
- {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]

Because of the variable composition of digester gas, monitoring of the fuel sulfur content of the digester gas will be required to document the quality of the digester gas and any effect on emissions. The following conditions will be placed on the engine permit to ensure compliance:

- The sulfur content of the digester gas used to fuel the engine shall be monitored and recorded at least once every calendar quarter in which a fuel sulfur analysis is not performed. Monitoring of the sulfur content of the digester gas fuel shall not be required if the engine does not operate during that period. Records of the results of monitoring of the digester gas fuel sulfur content shall be maintained. [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]

Digester System Backup Flare (N-6311-10-2)

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

- The sulfur content of the digester gas combusted in this flare 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 of the sulfur content of the digester gas flared shall not be required if the flare does not operate during that period. Records of the results of monitoring of the digester gas sulfur content shall be maintained. [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]

3. Recordkeeping

Recordkeeping is required to demonstrate compliance with the offset, public notification and daily emission limit requirements of Rule 2201. The following conditions will be listed on the permits:

Digester Gas-Fired IC Engine (N-6311-9-2)

- 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 records of: (1) the date and time of NO_x, CO, O₂, SO₂, and NH₃ measurements, (2) the O₂ concentration in percent and the measured NO_x, CO, SO₂, and NH₃ concentrations corrected to 15% O₂, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, (5) the method of determining the NH₃ emission concentration, and (6) a description of any corrective

action taken to maintain the emissions within the acceptable range. [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 or standard cubic meters 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]

Digester System Backup Flare (N-6311-10-2)

- Permittee shall maintain daily and annual records of the quantity of digester gas combusted in the flare in standard cubic feet (scf) or standard cubic meters. [District Rule 1070 and 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 1070, 2201, and 4311]

4. Reporting

No reporting is required to demonstrate compliance with District Rule 2201:

F. Ambient Air Quality Analysis (AAQA)

District Rule 2201 requires that an ambient air quality analysis (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 Technical Services Division of the SJVAPCD conducted the required analysis. Refer to Appendix F of this document for the AAQA summary sheet.

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

The results of the Criteria Pollutant Modeling conducted for the AAQA are summarized in the following table:

Criteria Pollutant Modeling Results*					
Digester Gas IC Engine & Flare	1 Hour	3 Hours	8 Hours.	24 Hours	Annual
CO	Pass	X	Pass	X	X
NO _x	Pass ¹	X	X	X	Pass
SO _x	Pass	Pass	X	Pass	Pass
PM ₁₀	X	X	X	Pass ²	Pass ²

* Results were taken from the PSD spreadsheet.

¹ The project was compared to the 1-hour NO₂ National Ambient Air Quality Standard that became effective on April 12, 2010 using the District's approved procedures.

² The criteria pollutants are below EPA's level of significance as found in 40 CFR Part 51.165 (b)(2).

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 2520 Federally Mandated Operating Permits

Since this facility's potential emissions do not exceed any major source thresholds of Rule 2201, this facility is not a major source, and Rule 2520 does not apply.

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.

Digester Gas-Fired IC Engine (N-6311-9-2)

Since the IC engine is 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 proposed ATC permit 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]

Digester System Backup Flare (N-6311-10-2)

Since the flare will only combust excess digester gas, visible emissions are not expected to exceed Ringelmann 1 or 20% opacity. Additionally, to ensure compliance with the particulate matter emission limit, visible emissions from the flare will be limited to no more than 10% opacity. The following condition will be listed on the proposed ATC permit to ensure compliance:

- 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 1/2 or 10% opacity. [District Rules 2201 and 4101]

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. Therefore, compliance with this rule is expected.

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 Health Risk Assessment (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 (Appendix F), 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 results of the health risk assessment are summarized in the table below.

RMR Summary				
Categories	1,057 bhp Digester Gas IC Engine (N-6311-9-2)	Anaerobic Digester Backup Flare (N-6311-10-2)	Project Totals	Facility Totals
Prioritization Score	2.13	0.07	>1	>1
Acute Hazard Index	0.00	0.00	0.00	0.00
Chronic Hazard Index	0.00	0.00	0.00	0.00
Maximum Individual Cancer Risk (10⁻⁶)	1.82E-08	1.14E-10	1.83E-08	1.83E-08
T-BACT Required?	No	No		
Special Permit Conditions?	No	No		

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 not required for this project because the HRA indicates that the risk is not above the District’s thresholds for triggering T-BACT requirements; therefore, compliance with the District’s Risk Management Policy is expected.

District policy APR 1905 also specifies that the increase in emissions associated with a proposed new source or modification not have acute or chronic indices, or a cancer risk greater than the District’s significance levels (i.e. acute and/or chronic indices greater than 1 and a cancer risk greater than 20 in a million). As outlined by the HRA Summary in

Appendix F of this report, the emissions increases for this project was determined to be less than significant.

Rule 4201 Particulate Matter Concentration

The purpose of this rule is to protect the ambient air quality by establishing a particulate matter emission standard. 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.

Digester Gas-Fired IC Engine (N-6311-9-2)

$$2.0 \frac{lb}{day} \times \frac{1 day}{24 hr} \times \frac{1 hr}{1,057 hp \cdot hr} \times \frac{1 hp \cdot hr}{2,545 Btu} \times \frac{10^6 Btu}{9,100 dscf} \times \frac{0.33 Btu_{out}}{1 Btu_{in}} \times \frac{7,000 grain}{1 lb} = 0.008 \frac{grain}{dscf}$$

Since 0.008 grain/dscf is less than 0.1 grain/dscf, compliance with this rule is expected.

Digester System Backup Flare (N-6311-10-2)

$$0.015 \frac{lb - PM}{1 MMBtu} \times \frac{1 MMBtu}{9,100 dscf} \times \frac{7,000 grain}{1 lb} = 0.012 \frac{grain}{dscf}$$

Since 0.012 grain/dscf is less than 0.1 grain/dscf, compliance with this rule is expected.

The following condition will be listed on the proposed ATC permits to ensure compliance:

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

District 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.

Section 5.0 - Requirements

Section 5.2 requires that a flame always be present in the flare whenever combustible gases are present. The following condition will be placed on the permit to ensure compliance:

- A flame shall be present at all times in the flare whenever combustible gases are vented through the flare. [District Rules 2201 and 4301]

Section 5.3 requires that the flare be equipped with either an automatic ignition system or operated with a continuous pilot. Per the applicant, this unit is equipped with an automatic ignition system. The following condition will be placed on the permit to ensure compliance:

- 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 Rules 2201 and 4311]

Section 5.4 requires that, except for flares equipped with a flow-sensing ignition system, flares must be equipped with a device to monitor and confirm operation of the pilot flame. The following condition will be placed on the permit to ensure compliance:

- Unless the flare is equipped with a flow-sensing ignition system, the flare shall be equipped and operated with a heat sensing device such as a thermocouple, ultraviolet beam sensor, infrared sensor, or an equivalent device, capable of continuously detecting at least one pilot flame. [District Rule 4311]

Section 5.5 requires that flares that use flow-sensing automatic ignition systems and which do not use a continuous flame pilot must use purge gas for purging. The following condition will be placed on the permit to ensure compliance:

- Flares that use flow-sensing automatic ignition systems and which do not use a continuous flame pilot shall use purge gas for purging. [District Rule 4311]

Section 5.6 requires open flares (air-assisted, steam-assisted, or non-assisted) in which the flare gas pressure is less than 5 psig to be operated in such a manner that meets the provisions of 40 CFR 60.18. The following condition will be placed on the permit to ensure compliance:

- Open flares (air-assisted, steam-assisted, or non-assisted) in which the flare gas pressure is less than 5 psig shall be operated in such a manner that meets the provisions of 40 CFR 60.18. [District Rule 4311]

Section 5.7 establishes VOC and NO_x emission limits for ground-level enclosed flares. The digester backup flare operated by Fiscalini Farms and Fiscalini Dairy is not a ground level enclosed flare. Therefore, the requirements of Section 5.7 are not applicable to the digester backup flare.

Section 5.8 prohibits flaring unless it is consistent with an approved flare minimization plan (FMP), pursuant to Section 6.5 or is caused by an emergency and is necessary to prevent an accident, hazard, or release of vent gas directly to the atmosphere. Section 6.5 specifies that a flare minimization plan is required for refinery flares and flares with a capacity of 5.0 MMBtu/hr or greater. The digester backup flare has a capacity of 5.0 MMBtu/hr or greater. Therefore, this section applies and the following condition will be placed on the permit to ensure compliance:

- Flaring is prohibited unless it is consistent with the approved flare minimization plan (FMP) and all commitments listed in that plan have been met. This standard does not apply if the APCO determines that the flaring is caused by an emergency as defined by Section 3.7 and is necessary to prevent an accident, hazard or release of vent gas directly to the atmosphere. [District Rule 4311]

Section 5.9 establishes SO₂ emission reduction standards for petroleum refinery flares. The flare being permitted is not a petroleum refinery flare. Therefore, this section does not apply.

Section 5.10 requires the operator of a flare subject to flare minimization requirements pursuant to Section 5.8 to monitor the vent gas flow to the flare with a flow measuring device and to maintain records pursuant to Section 6.1.7. Flares that the operator can verify, based

on permit conditions, are not capable of producing reportable flare events pursuant to Section 6.2.2 shall not be required to monitor vent gas flow to the flare.

As explained below under compliance with Section 6.2.2, the permit for the digester backup flare it limits it such that it cannot produce reportable flaring events. Therefore, the requirements of this section are not applicable.

Section 5.11 requires the operator of a petroleum refinery or a flare with a flaring capacity equal to or greater than 50 MMBtu/hr to monitor the flare pursuant to Sections 6.6, 6.7, 6.8, 6.9, and 6.10. The flare being permitted is not a petroleum refinery flare. Therefore, this section does not apply.

Section 6.0 - Administrative Requirements

Section 6.1 requires the operator of a flare to maintain certain records for five years. The following conditions will be placed on the permit to ensure compliance:

- 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. [District Rules 1070, 2201, and 4311]

Section 6.1 also states that the operator of a flare subject to this rule shall maintain the following records:

- 6.1.1 Copy of the compliance determination conducted pursuant to Section 6.4.1
- 6.1.2 Copy of the source testing result conducted pursuant to Section 6.4.2
- 6.1.3 For flares used during an emergency, record of the duration of flare operation, amount of gas burned, and the nature of the emergency situation
- 6.1.4 Operators claiming an exemption pursuant to Section 4.3 shall record annual throughput, material usage, or other information necessary to demonstrate an exemption under that section
- 6.1.5 A copy of the approved flare minimization plan pursuant to Section 6.5
- 6.1.6 Where applicable, a copy of annual reports submitted to the APCO pursuant to Section 6.2
- 6.1.7 Where applicable, monitoring data collected pursuant to Sections 5.10, 6.6, 6.7, 6.8, 6.9, and 6.10

Section 6.2.1 requires the operator of a flare subject to flare minimization plans pursuant to Section 5.8 to notify the APCO of an unplanned flaring event within 24 hours after the start of the next business day or within 24 hours of their discovery, whichever occurs first. The backup digester flare is subject to the requirements of Section 5.8. The following condition will be included on the ATC to ensure compliance with Section 6.2.1:

- The operator shall notify the APCO of an unplanned flaring event within 24 hours after the start of the next business day or within 24 hours of their discovery, whichever occurs first. The notification shall include the flare source identification, the start date and time, and the end date and time. [District Rule 4311]

Section 6.2.2 states that effective on and after July 1, 2012, and annually thereafter, the operator of a flare subject to flare minimization plans pursuant to Section 5.8 shall submit an

annual report to the APCO that summarizes all Reportable Flaring Events as defined Section 3.0 that occurred during the previous 12 month period.

The requirements of this section are applicable to the flare since the flare is subject to the FMP requirements of Section 5.8. However, a reportable flaring event is defined in Section 3.31 as any flaring event where more than 500,000 standard cubic feet of vent gas is flared per calendar day, or where sulfur dioxide emissions are greater than 500 pounds per calendar day. The proposed ATC permit for the flare limits the maximum amount of gas combusted in the flare to no more than 0.2119 MMscf/day (211,900 scf/day). Therefore, a condition of the proposed ATC permit limits the maximum amount of gas that can be combusted in the flare to below the level of a reportable flaring event; therefore, the reporting requirements of this section will not be included as a condition on the permit.

Section 6.2.3 states that effective on and after July 1, 2012, and annually thereafter, the operator of a flare subject to flare monitoring requirements pursuant to Sections 5.10, 6.6, 6.7, 6.8, 6.9, and 6.10, as appropriate, shall submit an annual report to the APCO within 30 days following the end of each 12 month period. The digester backup flare is not a petroleum refinery flare and is not rated at greater than 50 MMBtu/hr. Therefore, the flare is not subject to the requirements of Sections 5.10, 6.6, 6.7, 6.8, 6.9, or 6.10 and the requirements of this section are not applicable.

Section 6.3 specifies test methods to demonstrate compliance with Rule 4311. The digester backup flare is not a ground level enclosed flare and is not subject the testing or monitoring requirements of this section; therefore, this section does not apply.

Section 6.4.1 requires the operator of flares that are subject to Section 5.6 to make available to the APCO upon request the compliance determination records that demonstrate compliance with the provisions of 40 CFR 60.18, (c)(3) through (c)(5). The following condition will be included on the permit to ensure compliance with the requirements of Section 6.4.1:

- Upon request, the operator of an open flare in which the flare gas pressure is less than 5 psig shall make available records that demonstrate compliance with the provisions of 40 CFR 60.18, (c)(3) through (c)(5). [District Rules 2201 and 4311]

Section 6.4.2 requires the operator of ground-level enclosed flares to conduct source testing at least once every 12 months to demonstrate compliance with Section 5.7. The digester backup flare is not a ground level enclosed flare; therefore, this section does not apply.

Section 6.5 specifies requirements for operators of flares that are subject to the flare minimization plan (FMP) provisions of District Rule 4311.

Section 6.5.1 requires the operator of a petroleum refinery flare or any flare that has a flaring capacity of greater than or equal to 5.0 MMBtu per hour to submit a flare minimization plan (FMP) to the APCO for approval by July 1, 2010, specifies information that the FMP must include, and requires periodic updates of the FMP. The digester backup flare is rated at greater than 5.0 MMBtu/hr and is required to submit an FMP. The facility submitted the required FMP for the digester backup flare to the District on June 30, 2010.

Section 6.5.2 requires the operator to submit an updated FMP for each flare to the APCO for approval every five years after the initial FMP submittal, and specifies that the current FMP shall remain in effect until the updated FMP is approved by the APCO and that if the operator fails to submit an updated FMP as required by this section, the existing FMP shall no longer be considered an approved plan. The following condition will be included to ensure ongoing compliance this section:

- Every five years after submittal of the initial flare minimization plan (FMP), the operator shall submit an updated FMP for each flare to the APCO for approval. The current FMP shall remain in effect until the updated FMP is approved by the APCO. If the operator fails to submit an updated FMP as required by this section, the existing FMP shall no longer be considered an approved plan. [District Rule 4311]

Section 6.5.3 requires that an updated FMP shall be submitted by the operator pursuant to Section 6.5 addressing new or modified equipment, prior to installing the equipment and indicates that updated FMP submittals are only required if:

- 6.5.3.1 The equipment change would require an authority to construct (ATC) and would impact the emissions from the flare, and
- 6.5.3.2 The ATC is deemed complete after June 18, 2009, and
- 6.5.3.3 The modification is not solely the removal or decommissioning of equipment that is listed in the FMP, and has no associated increase in flare emissions.

The facility is not installing equipment under this ATC permit. The following condition will be included to ensure ongoing compliance this section:

- An updated flare minimization plan (FMP) shall be submitted pursuant to Section 6.5 of Rule 4311 addressing new or modified equipment, prior to installing the equipment. Updated FMP submittals are only required if: (1) The equipment change would require an Authority to Construct (ATC) and would impact the emissions from the flare, and (2) The modification is not solely the removal or decommissioning of equipment that is listed in the FMP, and has no associated increase in flare emissions. [District Rule 4311]

Sections 6.6, 6.7, 6.8, and 6.9 require additional monitoring for petroleum refinery flares and any flare that has a flaring capacity of greater than or equal to 50 MMBtu per hour. The digester backup flare is not a petroleum refinery flare and has a flaring capacity less than 50 MMBtu/hr. Therefore, these sections do not apply.

Section 6.10 requires the operator of a petroleum refinery flare to install and maintain equipment that records a real-time digital image of the flare and flame or to use an alternative monitoring method that provides data to verify date, time, vent gas flow, and duration of flaring events. The digester backup flare is not a petroleum refinery flare. Therefore, this section does not apply.

Rule 4701 Internal Combustion Engines – Phase I

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

Except as provided in Section 4.0, the provisions of this rule apply to any internal combustion engine rated greater than 50 bhp that requires a Permit to Operate (PTO). However, Section 4.1 of the rule specifically exempts IC engines in agricultural operations used for the growing of crops or raising of fowl or animals from the requirements of the rule.

As explained above, the District has determined that biogas-fueled IC engines at agricultural facilities that are operated by the agricultural facility and fueled with biogas generated at the facility are agricultural IC engines; therefore, the digester gas-fired IC engine at the facility is exempt from the requirements of 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 5.2.1 requires that the operator of a spark-ignited non-agricultural internal combustion engine rated > 50 bhp shall not operate it in such a manner that results in emissions exceeding the limits in Table 1 of Rule 4702 until such time that the engine has demonstrated compliance with emission limits in Table 2 of Rule 4702 pursuant to the compliance deadlines in Section 7.5. In lieu of complying with Table 1 emission limits, the operator of a spark-ignited engine shall comply with the applicable emission limits pursuant to Section 8.0. As explained above, the District has determined that biogas-fueled IC engines at agricultural facilities that are operated by the agricultural facility and fueled with biogas generated at the facility are agricultural IC engines; therefore, this section of the rule is not applicable to the engine.

Section 5.2.2 requires that on and after the compliance schedule specified in Section 7.5, the operator of a spark-ignited non-agricultural internal combustion engine rated > 50 bhp shall comply with all the applicable requirements of the rule and the requirements of Section 5.2.2.1, 5.2.2.2, or 5.2.2.3, on an engine-by-engine basis. As explained above, the digester gas-fired IC engine being permitted under this project is an agricultural IC engine; therefore, this section of the Rule is not applicable to the engine.

Section 5.2.3.1 requires that the operator of a spark-ignited internal combustion engine rated > 50 bhp that is used exclusively in agricultural operations shall not operate it in such a manner that results in emissions exceeding the limits in Table 3 of Rule 4702 for the appropriate engine type on an engine-by-engine basis.

Section 5.2.3.2 allows that in lieu of complying with the NO_x, CO, and VOC limits of Table 3 on an engine-by-engine basis, an operator of a spark-ignited agricultural IC engine may elect to implement an alternative emission control plan pursuant to Section 8.0. An alternate emission control plan has not been proposed for the digester gas-fired IC engine being permitted under this project; therefore, this section of the Rule does not apply to the engine.

Section 5.2.3.3 requires an operator of an agricultural IC engine in that is subject to the applicable requirements of Table 3 shall not replace such engine with an engine that emits more emissions of NO_x, VOC, and CO, on a ppmv basis, (corrected to 15% oxygen on a dry basis) than the engine being replaced.

Rule 4702, Table 3 Emission Limits/Standards and Compliance Schedule for Spark-Ignited IC Engines rated >50 bhp Used in Agricultural Operations			
Engine Type	NO_x Emission Limit (ppmv @ 15% O₂, dry)	CO Emission Limit (ppmv @ 15% O₂, dry)	VOC Emission Limit (ppmv @ 15% O₂, dry)
1. Rich-Burn	90 ppmv or 80% Reduction	2,000 ppmv	250 ppmv
2. Lean-Burn	150 ppmv or 70% Reduction	2,000 ppmv	750 ppmv
3. Certified Spark-Ignited Engine installed on or before June 16, 2005	Meet a Certified Spark-Ignited Engine Standard of HC + NO _x < 0.6 g/bhp-hr		

The following previously presented condition will be listed on the proposed ATC permit for the engine to ensure compliance:

- Emissions from this IC engine shall not exceed any of the following limits: 0.15 g-NO_x/bhp-hr (for periodic alternate monitoring, equivalent to 11 ppmvd NO_x @ 15% O₂), NO_x referenced as NO₂; 2.2 g-CO/bhp-hr (for periodic alternate monitoring, equivalent to 265 ppmvd CO @ 15% O₂); 0.10 g-VOC/bhp-hr (for periodic alternate monitoring, equivalent to 21 ppmvd VOC @ 15% O₂), VOC referenced as methane. [District Rules 2201 and 4702]

Section 5.2.4 requires the operator of a certified compression-ignited engine rated >50 bhp shall comply with the following requirements of Sections 5.2.4.1, 5.2.4.2, 5.2.4.3, 5.2.4.3, and 5.2.4.4. The digester gas-fired engine is not a compression-ignited engine; therefore, Section 5.2.4 does not apply to the engine.

Section 5.3 requires that all continuous emission monitoring systems (CEMS) emissions measurements shall be averaged over a period of 15 consecutive minutes. Any 15-consecutive minute block average CEMS measurement exceeding the applicable emission limits of this rule shall constitute a violation of this rule. The IC engine evaluated under this project will not have CEMS installed; therefore this section of the Rule is not applicable.

Section 5.4 specifies procedures to calculate percent emission reductions if percent emission reductions are used to comply with the NO_x emission limits of Section 5.2. The use of percent emission reductions to comply with Section 5.2 is not being proposed for the IC engine under this project; therefore this section of the Rule is not applicable.

Section 5.5 requires the operator of an internal combustion engine that uses percent emission reduction to comply with the NO_x emission limits of Section 5.2 shall provide an accessible inlet and outlet on the external control device or the engine as appropriate for taking emission samples and as approved by the APCO. The use of percent emission reductions to comply with Section 5.2 is not being proposed for the IC engine under this project; therefore this section of the Rule is not applicable.

Section 5.6 specifies procedures that operators of non-agricultural spark-ignited IC engines who elect to comply under Section 5.2.2.2 must use for calculation of the annual emissions fee. As explained above, the digester gas-fired IC engine being evaluated under this project is an agricultural IC engine; therefore payment of annual emissions fees for the engine is not required and this section of the Rule is not applicable.

Section 5.7 requires that on and after the compliance schedule specified in Section 7.5, operators of non-agricultural spark-ignited engines and non-agricultural compression-ignited engines shall comply with Sections 5.7.1, 5.7.2, 5.7.3, 5.7.4, 5.7.5, or 5.7.6:

- 5.7.1 Operate the engine exclusively on PUC-quality natural gas, commercial propane, butane, or liquefied petroleum gas, or a combination of such gases; or
- 5.7.2 Limit gaseous fuel sulfur content to no more than five (5) grains of total sulfur per one hundred (100) standard cubic feet; or
- 5.7.3 Use California Reformulated Gasoline for gasoline-fired spark-ignited engines; or
- 5.7.4 Use California Reformulated Diesel for compression-ignited engines; or
- 5.7.5 Operate the engine on liquid fuel that contains no more than 15 ppm sulfur, as determined by the test method specified in Section 6.4.6; or
- 5.7.6 Install and properly operate an emission control system that reduces SO₂ emissions by at least 95% by weight as determined by the test method specified in Section 6.4.6.

As explained above, the digester gas-fired IC engine being evaluated under this project is an agricultural IC engine; therefore, this section of the Rule is not applicable.

Section 5.8 requires that the operator of a non-agricultural spark-ignited IC engine subject to the requirements of Section 5.2 or any engine subject to the requirements of Section 8.0 shall comply with the monitoring requirements of Sections 5.8.1 – 5.8.11. As explained above, the digester gas-fired IC engine being evaluated under this project is an agricultural IC engine; therefore, this section of the Rule is not applicable.

Section 5.9 specifies monitoring requirements for all other engines that are not subject to the requirements of Section 5.8.

Section 5.9.1 requires the operator of any of the following engines shall comply with the requirements specified in Section 5.9.2 through Section 5.9.5 below:

- 5.9.1.1 An AO spark-ignited engine subject to the requirements of Section 5.2;
- 5.9.1.2 A compression-ignited engine subject to the requirements of Section 5.2;
- 5.9.1.3 An engine subject to Section 4.2

Section 5.9.2 requires the operator to properly operate and maintain each engine as recommended by the engine manufacturer or emission control system supplier. The following conditions will be placed on the engine ATC permit to ensure compliance:

- {4261} This engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer or emissions control system supplier. [District Rule 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]

Section 5.9.3 requires the operator to monitor the operational characteristics of each engine as recommended by the engine manufacturer or emission control system supplier. The monitoring requirements of this section are satisfied by the requirements of the I&M plan that are explained in detail in the section that covers Section 6.5 of this Rule.

Section 5.9.4 requires that the operator shall install and operate a nonresettable elapsed operating time meter. In lieu of installing a nonresettable time meter, the operator may use an alternative device, method, or technique in determining operating time provided that the alternative is approved by the APCO. The operator shall maintain and operate the required meter in accordance with the manufacturer's instructions. The applicant has proposed a nonresettable elapsed operating time meter for the engine in this project. Therefore, the following condition will be placed on the engine ATC permit to ensure compliance:

- This engine shall be equipped with an operational non-resettable elapsed time meter. [District Rules 2201 and 4702]

Section 5.9.5 requires the operator of an agricultural operation spark-ignited engine that has been retro-fitted with a NO_x exhaust control that has not been certified in accordance with Section 9.0 Exhaust Control System Certification Requirements, or a compression-ignited engine that has been retro-fitted with a NO_x exhaust control shall comply with the following:

- 5.9.5.1 Use a portable NO_x analyzer to take NO_x emission readings to demonstrate compliance with the emission requirements of Section 5.2.
- 5.9.5.2 The operator of a compression-ignited engine that is subject to the limits/standards of Section 5.2 Table 4 Category 1.d shall use a portable NO_x analyzer to take NO_x emission readings at least once every six (6) months that the engine is operated.
- 5.9.5.3 The operator of any other engine that has been retro-fitted with a NO_x exhaust control shall use a portable NO_x analyzer to take NO_x emission readings at least once every 24 months that the engine is operated.
- 5.9.5.4 All emission readings shall be taken with the engine operating either at conditions representative of normal operations or conditions specified in the Permit-to-Operate or Permit-Exempt Equipment Registration.
- 5.9.5.5 The portable NO_x analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO.
- 5.9.5.6 All NO_x emissions readings shall be reported to the APCO in a manner approved by the APCO.
- 5.9.5.7 NO_x emission readings taken pursuant to this section 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.

As explained in the section on compliance with District Rule 2201 Monitoring above, although Section 5.9.5 requires monitoring of NO_x emissions at least once every 24 months for an agricultural spark-ignited IC engine, because the Rule 2201 NSR emission limits with which the digester gas-fired IC engine must comply are much more stringent than the Rule 4702

emission limits for spark-ignited agricultural IC engines and also because the potential variability of the digester gas fuel, monitoring of the emissions once every 24 months would not be sufficient to ensure compliance with the emission limits in the proposed ATC permit and more frequent monitoring is required. Therefore, quarterly monitoring of NO_x, CO, and O₂ concentrations in accordance with pre-approved alternate monitoring plan "A" within District Policy SSP 1810 will be required. The following conditions will be placed on the engine ATC permit to ensure compliance with Section 5.9.5:

- The permittee shall monitor and record the stack concentration of NO_x, CO, O₂, and SO₂ at least once every calendar quarter (in which a source test is not performed) using a portable emission monitor that meets District specifications (or other District-approved method for SO₂/SO_x). [In-stack monitors may be allowed if they satisfy the standards for portable analyzers as specified in District policies and are approved in writing by the APCO.] Monitoring shall be performed not less than once every month for 12 months if two 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 Rules 2201 and 4702]
- {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]

Section 5.10 specifies SO_x Emissions Monitoring Requirements for non-agricultural IC engines. As explained above, the digester gas-fired IC engine being evaluated under this project is an agricultural IC engine; therefore, this section of the Rule is not applicable.

Section 5.11 requires operators of engines used exclusively in agricultural operations that are not required to have a Permit-to-Operate pursuant to California Health and Safety Code Section 42301.16 but are required to comply with Section 5.2 of Rule 4702 shall register such engines pursuant to Rule 2250 (Permit-Exempt Equipment Registration). The spark-ignited agricultural digester gas-fired engine is required to have a District Permit to Operate; therefore this section of the Rule is not applicable.

Section 6.1 requires that the operator of an engine subject to the requirements of Rule 4702 shall submit to the APCO an approvable 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. If there is no change to the previously-approved emission control plan, the operator shall submit a letter to the District indicating that the previously approved plan is still valid.

Section 6.1.1 specifies that the requirement to submit an emission control plan shall apply to the following engines:

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

Section 6.1.2 specifies that the emission control plan shall contain the following information, as applicable for each engine:

- 6.1.2.1 Permit-to-Operate number, Authority-to-Construct number, or Permit-Exempt Equipment Registration number,
- 6.1.2.2 Engine manufacturer,
- 6.1.2.3 Model designation and engine serial number,
- 6.1.2.4 Rated brake horsepower,
- 6.1.2.5 Type of fuel and type of ignition,
- 6.1.2.6 Combustion type: rich-burn or lean-burn,
- 6.1.2.7 Total hours of operation in the previous one-year period, including typical daily operating schedule,
- 6.1.2.8 Fuel consumption (cubic feet for gas or gallons for liquid) for the previous one-year period,
- 6.1.2.9 Stack modifications to facilitate continuous in-stack monitoring and to facilitate source testing,
- 6.1.2.10 Type of control to be applied, including in-stack monitoring specifications,
- 6.1.2.11 Applicable emission limits,
- 6.1.2.12 Documentation showing existing emissions of NO_x, VOC, and CO, and
- 6.1.2.13 Date that the engine will be in full compliance with this rule.

Section 6.1.3 requires that the emission control plan shall identify the type of emission control device or technique to be applied to each engine and a construction/removal schedule, or shall provide support documentation sufficient to demonstrate that the engine is in compliance with the emission requirements of this rule.

Section 6.1.4 requires that for an engine being permanently removed from service, the emission control plan shall include a letter of intent pursuant to Section 7.2.

The applicant has submitted all the required information for Section 6.1 in the application for the IC engine evaluated under this project.

Section 6.2.1 requires that the operator of an engine subject to the requirements of Section 5.2 shall maintain an engine operating log to demonstrate compliance with Rule 4702. 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:

- 6.2.1.1 Total hours of operation,
- 6.2.1.2 Type of fuel used,

- 6.2.1.3 Maintenance or modifications performed,
- 6.2.1.4 Monitoring data,
- 6.2.1.5 Compliance source test results, and
- 6.2.1.6 Any other information necessary to demonstrate compliance with this rule.
- 6.2.1.7 For an engine subject to Section 8.0, the quantity (cubic feet of gas or gallons of liquid) of fuel used on a daily basis.

The following condition will be placed on the ATC permit:

- 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 or standard cubic meters using a non-resettable, totalizing mass or volumetric fuel flow meter or other APCO approved-device. [District Rules 2201 and 4702]

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 previously presented condition will be listed on the proposed ATC permit to ensure compliance:

- 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]

Section 6.2.3 requires that an operator claiming an exemption under Section 4.2 or Section 4.3 shall maintain annual operating records. This information shall be retained for at least five years, shall be readily available, and provided to the APCO upon request. The records shall include, but are not limited to, the following:

- 6.2.3.1 Total hours of operation,
- 6.2.3.2 The type of fuel used,
- 6.2.3.3 The purpose for operating the engine,
- 6.2.3.4 For emergency standby engines, all hours of non-emergency and emergency operation shall be reported, and
- 6.2.3.5 Other support documentation necessary to demonstrate claim to the exemption

The applicant is not claiming an exemption for the engine under Section 4.2 or Section 4.3; therefore, this section does not apply.

Section 6.3 requires that the operator of an engine subject to the emission limits in Section 5.2 or the requirements of Section 8.2, shall comply with the compliance testing requirements of Section 6.3.

Section 6.3.1 specifies that the requirements of Section 6.3.2 through Section 6.3.4 shall apply to the following engines:

- 6.3.1.1 Engines that have been retrofitted with an exhaust control device, except those certified per Section 9.0;
- 6.3.1.2 Engines subject to Section 8.0;

- 6.3.1.3 An agricultural spark-ignited engine that is subject to the requirements of Section 8.0;
- 6.3.1.4 An agricultural spark-ignited engine that has been retrofitted with a catalytic emission control and is not subject to the requirements of Section 8.0

Section 6.3.2 requires demonstration of compliance with applicable limits, ppmv or percent reduction, in accordance with the test methods in Section 6.4, as specified below:

- 6.3.2.1 By the applicable date specified in Section 5.2, and at least once every 24 months thereafter, except for an engine subject to Section 6.3.2.2.
- 6.3.2.2 By the applicable date specified in Section 5.2 and at least once every 60 months thereafter, for an agricultural spark-ignited engine that has been retro-fitted with a catalytic emission control device.
- 6.3.2.3 A portable NO_x analyzer may be used to show initial compliance with the applicable limits/standards in Section 5.2 for agricultural spark-ignited engines, provided the criteria specified in Sections 6.3.2.3.1 to 6.3.2.3.5 are met, and a source test is conducted in accordance with Section 6.3.2 within 12 months from the required compliance date.

As explained above, the digester gas-fired IC engine being evaluated under this project is an agricultural IC engine that is equipped with an SCR system for control of emissions; therefore, it is subject to Section 6.3.2.2 of District Rule 4702, which requires source testing of NO_x, CO, and VOC emissions at least once every 60 months for an agricultural spark-ignited IC engine. However, as explained in the section on compliance with District Rule 2201 Source Testing above, to ensure compliance with the much more stringent Rule 2201 NSR emission limits that apply to the engine, source testing for NO_x, CO, and VOC engine from the digester gas fired IC engine served by a catalytic control system shall be required at least once every 24 months in accordance with District practice and the draft District Source Test Policy (APR 1705). Because the engine will be equipped with an SCR system to control emissions, periodic testing of ammonia slip will also be required.

The following condition will be included the ATC permit to ensure compliance:

- Source testing to measure NO_x, CO, VOC, SO_x, PM₁₀, and ammonia (NH₃) emissions from this unit shall be conducted at least once every 24 months. [District Rules 1081, 2201, and 4702]

Section 6.3.3 requires the operator to conduct emissions source testing with the engine operating either at conditions representative of normal operations or conditions specified in the Permit-to-Operate or Permit-Exempt Equipment Registration. For emissions source testing performed pursuant to Section 6.3.2 for the purpose of determining compliance with an applicable standard or numerical limitation, the arithmetic average of three (3) 30-consecutive-minute test runs shall apply. If two (2) of three (3) runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. VOC shall be reported as methane. VOC, NO_x, and CO concentrations shall be reported in ppmv, corrected to 15 percent oxygen. For engines that comply with a percent reduction limit, the percent reduction of NO_x emissions shall also be reported.

The following conditions will be included in the ATC permit to ensure compliance:

- {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 30-consecutive-minute test runs shall apply. 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 methane. NO_x, CO, VOC, SO_x, and NH₃ concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rules 2201 and 4702]

Section 6.3.4 requires that in addition to other information, the source test protocol shall describe which critical parameters will be measured and how the appropriate range for these parameters shall be established. The range for these parameters shall be incorporated into the I&M plan.

Section 6.3.5 specifies that engines that are limited by Permit-to-Operate or Permit-Exempt Equipment Registration condition to be fueled exclusively with PUC quality natural gas shall not be subject to the reoccurring source test requirements of Section 6.3.2 for VOC emissions. The IC engine addressed under this project is fueled on digester gas; therefore this section does not apply.

Section 6.3.6 specifies requirements for spark-ignited engines for testing a unit or units that represent a specified group of units, in lieu of compliance with the applicable requirements of Section 6.3.2. Testing of representative units is not being proposed for the engine addressed under this project; therefore this section does not apply.

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

- 6.4.1 Oxides of nitrogen - EPA Method 7E, or ARB Method 100.
- 6.4.2 Carbon monoxide - EPA Method 10, or ARB Method 100.
- 6.4.3 Stack gas oxygen - EPA Method 3 or 3A, or ARB Method 100.
- 6.4.4 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.
- 6.4.5 Operating horsepower determination - any method approved by EPA and the APCO.
- 6.4.6 SO_x Test Methods
 - 6.4.6.1 Oxides of sulfur – EPA Method 6C, EPA Method 8, or ARB Method 100.
 - 6.4.6.2 Determination of total sulfur as hydrogen sulfide (H₂S) content – EPA Method 11 or EPA Method 15, as appropriate.
 - 6.4.6.3 Sulfur content of liquid fuel – American Society for Testing and Materials (ASTM) D 6920-03 or ASTM D 5453-99.
 - 6.4.6.4 The SO_x emission control system efficiency shall be determined using the following:

$$\% \text{ Control Efficiency} = [(C_{\text{SO}_2, \text{inlet}} - C_{\text{SO}_2, \text{outlet}}) / C_{\text{SO}_2, \text{inlet}}] \times 100$$

Where:

$C_{SO_2, \text{inlet}}$ = concentration of SO_x (expressed as SO_2) at the inlet side of the SO_x emission control system, in lb/Dscf

$C_{SO_2, \text{outlet}}$ = concentration of SO_x (expressed as SO_2) at the outlet side of the SO_x emission control system, in lb/Dscf

6.4.7 The Higher Heating Value (hhv) of the fuel shall be determined by one of the following test methods:

6.4.7.1 ASTM D 240-02 or ASTM D 3282-88 for liquid hydrocarbon fuels.

6.4.7.2 ASTM D 1826-94 or ASTM 1945-96 in conjunction with ASTM D 3588-89 for gaseous fuel.

The following conditions will be listed on the proposed ATC permit to ensure compliance:

- The following methods shall be used for source testing: NO_x (ppmv) - EPA Method 7E or ARB Method 100; CO (ppmv) - EPA Method 10 or ARB Method 100; VOC (ppmv) - EPA Method 18, 25A or 25B, or ARB Method 100; stack gas oxygen - EPA Method 3 or 3A or ARB Method 100; 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, or ARB Method 5 in combination with Method 501; NH_3 - BAAQMD ST-1B or SCAQMD Method 207-1. Alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702]
- The Higher Heating Value (HHV) of the fuel gas shall be determined using ASTM D1826, ASTM 1945 in conjunction with ASTM D3588, or an alternative method approved by the District. [District Rules 2201 and 4702]

Section 6.5 requires that the operator of an engine that is subject to the requirements of Section 5.2 or the requirements of Section 8.0 shall submit to the APCO for approval, an Inspection & Maintenance (I&M) plan that specifies all actions to be taken to satisfy the requirements of Sections 6.5.1 through Section 6.5.9 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 information specified below. 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 specifies that the I&M plan requirements of Sections 6.5.2 through Section 6.5.9 shall apply to the following engines:

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

The digester gas-fired IC engine evaluated under this project is equipped with an SCR system for control of NO_x . Therefore, the requirements of Sections 6.5.2 through 6.5.9 are applicable to the engine.

Section 6.5.2 requires procedures requiring the operator to establish 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 monthly in conformance with a regular inspection schedule in the I&M plan.

The digester gas-fired IC engine evaluated under this project is equipped with an SCR system for control of NO_x. The following alternate monitoring program is proposed to ensure compliance with Sections 6.5.2 and 6.5.3 of the Rule.

NO_x Emissions:

In order to satisfy the I & M requirements for NO_x emissions, the applicant has proposed to perform the following:

1. Measurement of NO_x emissions concentrations with a portable analyzer at least once every calendar quarter.
2. To ensure that NO_x emissions concentrations are not being exceeded between periodic NO_x portable analyzer measurements, the applicant is proposing to determine a correlation between the SCR system's reagent injection rate and the catalyst control system inlet exhaust temperature and NO_x emissions. The appropriate ranges for each operating load will be established during performance testing and will be monitored at least once per month.

Therefore, the following conditions will be listed on the proposed ATC permits to ensure compliance with the I & M requirements for NO_x:

- The SCR system reagent injection rate and inlet temperature to the catalyst control system shall be monitored to establish acceptable values and ranges that provide a reasonable assurance of ongoing compliance with the NO_x emissions limit(s) stated in this permit. Acceptable values and ranges shall be established for each load that the engine is expected to operate at, in a minimum of 10% increments (e.g. 70%, 80%, and 90%). Records of the acceptable SCR system reagent injection rate(s) and inlet temperature(s) to the catalyst control system demonstrated to result in compliance with the NO_x emission limit(s) shall be maintained and made available for inspection upon request. [District Rule 4702]
- If the SCR system reagent injection rate and/or the inlet temperature to the catalyst control system is outside of the established acceptable range(s), the permittee shall return the SCR system reagent injection rate and inlet temperature to the catalyst control system to within the established acceptable range(s) as soon as possible, but no longer than 8 hours after detection. If the SCR system reagent injection rate and inlet temperature to the catalyst control system are not returned to within acceptable range(s) within 8 hours, the permittee shall notify the District within the following 1 hour and begin monitoring and recording the stack concentration of NO_x and O₂ at least once every month. Monthly monitoring of the stack concentration of NO_x and O₂ shall continue until the operator can show that the SCR system reagent injection rate and inlet temperature to the catalyst control

system are operating within the acceptable range(s) demonstrated to result in compliance with the NO_x emission limit(s) of this permit. [District Rule 4702]

- The permittee shall monitor and record the engine operating load, the SCR system reagent injection rate, and the inlet exhaust temperature to the catalyst control system at least once per month. [District Rule 4702]

Section 6.5.4 requires procedures for the corrective actions on the noncompliant parameter(s) that the 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 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 applicant has proposed that the alternate monitoring program will ensure compliance with these two sections of the Rule. Therefore, the following conditions will be listed on the proposed ATC permits to ensure compliance:

- If the NO_x, CO, SO₂, or NH₃ concentrations corrected to 15% O₂, as measured by the portable analyzer or the District-approved ammonia monitoring equipment, exceed the respective allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours of operation after detection. If the portable analyzer or ammonia monitoring equipment readings continue to exceed the allowable emissions concentration after 8 hours of operation after detection, 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 the performing the notification and testing required by this condition. SO₂ concentrations measured at times that SO₂/SO_x emissions are demonstrated not to exceed 2.0 lb/day based on the engine operating load or exhaust flow rate are not subject to the requirements in this condition to conduct a source test or stipulate that an emissions violation has occurred. [District Rules 2201 and 4702]
- If the SCR system reagent injection rate and/or the inlet temperature to the catalyst control system is outside of the established acceptable range(s), the permittee shall return the SCR system reagent injection rate and inlet temperature to the catalyst control system to within the established acceptable range(s) as soon as possible, but no longer than 8 hours after detection. If the SCR system reagent injection rate and inlet temperature to the catalyst control system are not returned to within acceptable range(s) within 8 hours, the permittee shall notify the District within the following 1 hour and begin monitoring and recording the stack concentration of NO_x and O₂ at least once every month. Monthly monitoring of the stack concentration of NO_x and O₂ shall continue until the operator can show that the SCR system reagent injection rate and inlet temperature to the catalyst control system are operating within the acceptable range(s) demonstrated to result in compliance with the NO_x emission limit(s) of this permit. [District Rule 4702]

Section 6.5.6 requires procedures for and corrective maintenance performed for the purpose of maintaining an engine in proper operating condition. The following conditions will be listed on the proposed ATC permit to ensure compliance:

- {4261} This engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer or emissions control system supplier. [District Rule 4702]
- {3203} This engine shall be operated within the ranges that the source testing has shown result in pollution concentrations within the emissions limits as specified on this permit. [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 5.8.9. As explained above, the digester gas-fired IC engine being evaluated under this project is an agricultural IC engine; therefore, Section 5.8.9 of the Rule does not apply.

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 5.8.1 and 5.8.2. Data collected through the I&M plan shall have retrieval capabilities as approved by the APCO. The proposed alternate monitoring program will ensure compliance with this section of the Rule. The following condition will be listed on the engine ATC permit to ensure compliance:

- The permittee shall maintain records of: (1) the date and time of NO_x, CO, O₂, SO₂, and NH₃ measurements, (2) the O₂ concentration in percent and the measured NO_x, CO, SO₂, and NH₃ concentrations corrected to 15% O₂, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, (5) the method of determining the NH₃ emission concentration, and (6) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 2201 and 4702]

Section 6.5.9 specifies procedures for revising the I&M plan. The I&M plan shall be updated to reflect any change in operation. The I&M plan shall be updated prior to any planned change in operation. An engine operator 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 or Permit-Exempt Equipment Registration. The operator of an engine may request a change to the I&M plan at any time.

The following condition will be listed on the engine ATC permit to ensure compliance:

- {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 7.0 specifies the schedules for compliance with the general requirements of Section 5.0 and the Alternative Emission Control Plan (AECPP) option of Section 8.0. The IC engine is currently required to comply with the applicable sections of District Rule 4702; therefore, compliance with this section is expected.

Section 8.0 specifies requirements for use of an Alternative Emission Control Plan (AECPP) to comply with the NO_x emission requirements of Section 5.2 for a group of engines. Requirements for use of an AECPP include: only engines subject to Section 5.2 are eligible for inclusion in an AECPP; during any seven consecutive day period, the operator shall operate all engines in the AECPP to achieve an actual aggregate NO_x emission level that is ≤ 90% of the NO_x emissions that would be obtained by controlling the engines to comply individually with the NO_x limits in Section 5.2; the operator shall establish a NO_x emission factor limit for each engine; the operator must submit the AECPP at least 18 months before compliance with the emission limits in Section 5.2 is required and receive approval from the APCO; the operator must submit and updated or modified AECPP for approval by the APCO prior to any modifications; and the operator must maintain records necessary to demonstrate compliance with AECPP. The use of an Alternate Emission Control Plan to comply with Section 5.2 is not being proposed for the IC engine evaluated under this project; therefore, this section of the Rule is not applicable.

Section 9.0 specifies requirements for certification of exhaust control systems for compliance with District Rule 4702. Certification under this section is not currently being proposed for the exhaust control system for the IC engine evaluated under this project; therefore this section of the Rule is not applicable.

Conclusion

As shown above, the agricultural, digester gas-fired, lean burn, IC engine is expected to comply with the applicable requirements of Rule 4702 and no further discussion is required.

Rule 4801 Sulfur Compounds

The purpose of this District Rule 4801 is to limit the emissions of sulfur compounds. The limit is that sulfur compound emissions (as SO₂) shall not exceed 0.2% by volume. Using the ideal gas equation, the sulfur compound emissions are calculated as follows:

$$\text{Volume of SO}_x \text{ as (SO}_2\text{)} = (n \times R \times T) \div P$$

Where:

$$n = \text{moles SO}_x$$

$$T \text{ (standard temperature)} = 60 \text{ }^\circ\text{F or } 520 \text{ }^\circ\text{R}$$

$$R \text{ (universal gas constant)} = \frac{10.73 \text{ psi} \cdot \text{ft}^3}{\text{lb} \cdot \text{mol} \cdot \text{ }^\circ\text{R}}$$

Digester Gas-Fired IC Engine (N-6311-9-2)

$$0.0114 \frac{lb}{MMBtu} \times \frac{1 MMBtu}{9,100 scf_{exhaust}} \times \frac{1 lb \cdot mol}{64.06 lb \cdot SO_2} \times \frac{10.73 psi \cdot ft^3}{lb \cdot mol \cdot ^\circ R} \times \frac{520^\circ R}{14.7 psi} \times 1,000,000 ppm = 7.4 ppmv$$

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

- SOx emissions from this IC engine shall not exceed 2.1 ppmvd @ 15% O2, or shall not exceed 2.0 lb/day. SOx concentrations in the exhaust will be determined as the sum of the measured SO2 and SO3 concentrations. [District Rules 2201 and 4801] N

Since 7.4 ppmv is \leq 2000 ppmv, the engine is expected to comply with Rule 4801.

Digester System Backup Flare (N-6311-10-2)

$$0.141 \frac{lb}{MMBtu} \times \frac{1 MMBtu}{9,100 scf_{exhaust}} \times \frac{1 lb \cdot mol}{64.06 lb \cdot SO_2} \times \frac{10.73 psi \cdot ft^3}{lb \cdot mol \cdot ^\circ R} \times \frac{520^\circ R}{14.7 psi} \times 1,000,000 ppm = 91.8 ppmv$$

Since 91.8 ppmv is \leq 2000 ppmv, the flare is expected to comply with Rule 4801.

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

- The sulfur content of the digester gas flared shall not exceed 500 ppmv as H2S. [District Rules 2201 and 4801]

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

This rule incorporates the New Source Performance Standards (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 purpose of 40 CFR 60 Subpart JJJJ is to establish New Source Performance Standards to reduce emissions of NO_x, SO_x, PM, CO, and VOC from new stationary spark ignition (SI) internal combustion (IC) engines.

Pursuant to Section 60.4230, compliance with this subpart is required for owners and operators of stationary SI IC engines that commence construction after June 12, 2006, where the stationary SI ICE are manufactured: (a) on or after July 1, 2007, for engines with a maximum engine power greater than or equal to 500 HP (except lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP); (b) on or after January 1, 2008, for lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP; (c) on or after July 1, 2008, for engines with a maximum engine power less than 500 HP; or (d) on or after January 1, 2009, for emergency engines with a maximum engine power greater than 19 KW (25 HP).

The engine being evaluated under this project is a 1,057 bhp lean burn spark-ignited (SI) IC engine. The engine was installed onsite at the dairy farm in August of 2008 and, according to the information in the original ATC application for the engine, the engine was manufactured in

2007. The engine is a lean burn engine with a maximum rating greater than or equal to 500 bhp and less than 1,350 bhp. The engine was manufactured prior to January 1, 2008 and has not been modified (as defined by the 40 CFR 60) or reconstructed; therefore, the engine is not subject to this subpart.

40 CFR 63 Subpart ZZZZ National Emission Standards for Hazardous Air Pollutants for Stationary Internal Combustion Engines

40 CFR 63 Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAPs) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. A major source of HAP emissions is a facility that has the potential to emit any single HAP at a rate of 10 tons/year or greater or any combinations of HAPs at a rate of 25 tons/year or greater. An area source of HAPs is a facility is not a major source of HAPs.

Pursuant to Section 63.6590(a)(2)(iii), a stationary Reciprocating Internal Combustion Engine (RICE) located at an area source of HAP emissions is new if construction of the stationary RICE commenced on or after June 12, 2006. Construction of the stationary engine evaluated under this project commenced on or after June 12, 2006; therefore it is a new RICE.

Pursuant to Section 63.6590(c), an affected source that is a new or reconstructed stationary Reciprocating Internal Combustion Engine (RICE) located at an area source must meet the requirements of 40 CFR 63, Subpart ZZZZ by meeting the requirements of 40 CFR 60, Subpart IIII, for compression ignition engines or 40 CFR 60, Subpart JJJJ, for spark ignition engines and no further requirements apply for such engines under this part.

The spark-ignited engine evaluated under this project is a new RICE located at an area source of HAP emissions and therefore must comply with 40 CFR 63, Subpart ZZZZ by complying with 40 CFR 60, Subpart JJJJ. As shown above, 40 CFR 60, Subpart JJJJ does not contain any applicable requirements for this engine. Additionally, the District has not been delegated the authority to implement 40 CFR 63, Subpart ZZZ for non-Major Sources; therefore, no further discussion is required.

California Health & Safety Code 42301.6 (School Notice)

The District has verified that this site is not located within 1,000 feet of a school. Therefore, pursuant to California Health and Safety Code 42301.6, a school notice is not required.

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

As explained above, the District originally evaluated the installation of the units addressed by this project under Project N-1072585 (ATCs N-6311-9-0 and -10-0). As discussed the evaluation for Project N-1072585, Stanislaus County prepared a Negative Declaration 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.

It should be noted, that the project is expected to reduce greenhouse gas emissions since manure from existing open basin(s) and pond(s) is now being sent to digester tanks, which capture of much of the methane that was previously released into the atmosphere. Combustion of the dairy digester gas in the engine oxidizes the methane in the gas to carbon dioxide and water vapor. Because methane has a global warming potential at least 21 times that of carbon dioxide, combustion of the methane from the dairy digesters results in a large net decrease in the global warming potential emitted from the dairy when compared to previous levels.

District CEQA Findings

The Districts CEQA findings regarding approval of the original ATC permits can be found in Project # N-1072585. The District previously reviewed the Negative Declaration prepared for the project by Stanislaus County and found it to be adequate.

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). The District's engineering evaluation of the project (this document) demonstrates that compliance with District rules and permit conditions would ensure that Stationary Source emissions from the project are below the District's significance thresholds for criteria pollutants. The District has determined that no additional findings are required (CEQA Guidelines §15096(h)).

IX. Recommendation

Compliance with all applicable rules and regulations is expected. Pending a successful NSR Public Noticing period, issue ATCs N-6311-9-2 and -10-2 subject to the permit conditions on the attached draft ATCs in Appendix G.

X. Billing Information

Annual Permit Fees			
Permit Number	Fee Schedule	Fee Description	Annual Fee
N-6311-9-2	3020-10-F	1,057 bhp IC engine	\$785.00
N-6311-10-2	3020-02-G	5.3 MMBtu/hr Flare	\$855.00

Appendixes

- A: Previous ATC Permits for the Engine (N-6311-9-0 & -9-1) and Flare (N-6311-10-0 & -10-1)
- B: Summaries of the 5/12/2015 and 5/20/2014 Engine Source Test Results
- C: Summary of the 11/17/2010 Flare Source Test Results
- D: Quarterly Net Emissions Change (QNEC)
- E: BACT Analysis for the Digester Gas-Fired IC Engine
- F: Summary of Health Risk Assessment (HRA) and Ambient Air Quality Analysis (AAQA)
- G: Draft ATCs (N-6311-9-2 & -10-2)

APPENDIX A
Previous ATC Permits for the Engine (N-6311-9-0 & -9-1)
and Flare (N-6311-10-0 & -10-1)



San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

AUTHORITY TO CONSTRUCT

PERMIT NO: N-6311-9-0

ISSUANCE DATE: 09/21/2007

LEGAL OWNER OR OPERATOR: FISCALINI FARMS & FISCALINI DAIRY
MAILING ADDRESS: 7231 COVERT RD
MODESTO, CA 95358

LOCATION: 4848 JACKSON RD
MODESTO, CA 95358

EQUIPMENT DESCRIPTION:
1057 HP LEAN-BURN BIOGAS FIRED (GUASCOR MODEL SFGLD-560) IC ENGINE WITH A MIRATECH OXIDATION CATALYST (OR DISTRICT APPROVED EQUIVALENT) AND A MIRATECH SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM CATALYST (OR DISTRICT APPROVED EQUIVALENT) DRIVING A 750 KW ELECTRICAL GENERATOR

CONDITIONS

1. 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 NSR Rule]
2. No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
3. 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]
4. Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
5. The engine shall be fired solely on the digester gas. [District Rules 2201 and 4801]
6. This engine shall be equipped with an operational non-resettable elapsed time meter. [District Rule 2201]
7. The H2S content of the digester gas used as a fuel in the engine shall not exceed 50 ppmv. [District Rules 2201 and 4801]
8. Emission rates from engine, shall not exceed any of the following limits: NOx (as NO2) - 9.0 ppmvd @ 15% O2, CO - 95.0 ppmvd @ 15% O2, VOC - 20.0 ppmvd @ 15% O2, PM10 - 0.02 g/hp-hr. Compliance with the NOx, CO, and VOC limits in this condition only shall be based on the arithmetic average of three (3) 30-consecutive-minute test runs. [District Rules 2201 and 4702]
9. The ammonia (NH3) emissions shall not exceed 10 ppmvd @ 15% O2. Compliance with the NH3 limit shall be based on the arithmetic average of three (3) 30-consecutive-minute test runs. [District Rule 2201]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (209) 557-6400 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.

Seyed Sadroddin, Executive Director / APCO


DAVID WARNER, Director of Permit Services
N-6311-9-0 Sep 21 2007 4:03PM -- SRANK Joint Inspection NOT Required

10. NO_x, CO, VOC, and NH₃ emissions rates shall be measured (source tested) initially within 90 days of startup and not less than once every 12 months thereafter. [District Rules 1081 and 4702]
11. Compliance demonstration (source testing) shall be District witnessed, or authorized and samples shall be collected by a California Air Resources Board certified testing laboratory. Source testing shall be conducted using the methods and procedures approved by the District. Source testing may occur more frequently than once every 12 months at the discretion of the equipment owner or operator, if such frequency is necessary to schedule source testing during normal operating periods. Any source testing conducted more frequently than required, shall reset the 12 month testing clock. [District Rule 1081]
12. 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]
13. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081]
14. The following test methods shall be used for testing: NO_x (ppmv) - EPA Method 7E or ARB Method 100, CO (ppmv) - EPA Method 10 or ARB Method 100, VOC (ppmv) - EPA Method 25A or 25B, or ARB Method 100, stack gas oxygen - EPA Method 3 or 3A or ARB Method 100, and ammonia - BAAQMD ST-1B. EPA approved alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702]
15. Testing to demonstrate compliance with the fuel H₂S content limit of this permit shall be conducted weekly. Once eight (8) consecutive weekly tests show compliance, the fuel H₂S content testing frequency may be reduced to once every calendar quarter. If a quarterly test shows a violation of the H₂S content limit of this permit, then weekly testing shall resume and continue until eight (8) consecutive tests show compliance. Once compliance is shown on eight (8) consecutive weekly tests, then testing may return to quarterly. [District Rule 2201]
16. H₂S content of the fuel shall be measured using either EPA Method 15, ASTM Method D1072, D3031, D4084, D3246, D5504 or with the use of the Testo 350 XL portable analyzer. [District Rule 2201]
17. 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]
18. The permittee shall monitor and record the stack concentration of NO_x, CO, and O₂ at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. 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. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rule 4702]
19. Within 90 days of implementation of this ATC, 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 five days of restarting the unit unless monitoring has been performed within the last quarter. [District Rule 4102]

CONDITIONS CONTINUE ON NEXT PAGE

20. If the NO_x or CO concentrations corrected to 15% O₂, as measured by the portable analyzer, or the NH₃ concentrations corrected to 15% O₂, as measured by District approved gas-detection tubes, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours of operation after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 8 hours of operation after detection, 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 the performing the notification and testing required by this condition. [District Rule 4702]
21. 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]
22. 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, CO, and NH₃ concentrations corrected to 15% O₂, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, (5) the method of determining the NH₃ emission concentration, and (6) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rule 4702]
23. The permittee shall maintain an engine operating log for this engine. The log shall include, on a monthly basis, the total hours of operation, type and quantity of fuel used, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance with District Rule 4702. Quantity of fuel used shall be recorded in standard cubic feet and calculated as follows: Specific engine fuel use in standard cubic feet per month = Total facility fuel use in standard cubic feet per month x (Specific engine gross kW-hours per month) ÷ (Total facility gross kW-hours per month). [District Rule 4702]
24. Records of biogas analyzer installed to monitor methane, carbon dioxide, and hydrogen sulfide shall be maintained and shall be made available for District inspection upon request. [District Rule 2201]
25. 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. [District Rule 4702]
26. 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]
27. This engine shall be operated within the ranges that the source testing has shown result in pollution concentrations within the emissions limits as specified on this permit. [District Rule 4702]
28. 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]
29. 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]
30. 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]
31. 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

32. . 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 firing rate may be authorized for any alternate equipment. [District Rule 2201]



AUTHORITY TO CONSTRUCT

PERMIT NO: N-6311-9-1

ISSUANCE DATE: 12/17/2008

LEGAL OWNER OR OPERATOR: FISCALINI FARMS & FISCALINI DAIRY
MAILING ADDRESS: 7231 COVERT RD
MODESTO, CA 95358

LOCATION: 4848 JACKSON RD
MODESTO, CA 95358

EQUIPMENT DESCRIPTION:

MODIFICATION OF 1,057 BHP GUASCOR MODEL SFGLD-560 BIOGAS-FIRED LEAN-BURN IC ENGINE WITH A MIRATECH OXIDATION CATALYST (OR DISTRICT APPROVED EQUIVALENT) AND A MIRATECH SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM CATALYST (OR DISTRICT APPROVED EQUIVALENT) DRIVING A 750 KW ELECTRICAL GENERATOR: INCORPORATE CONDITIONS ALLOWING BACT FOR NOX TO BE DETERMINED AT HIGHER LEVEL IF 0.15 G/BHP-HR IS NOT ACHIEVABLE FOR THE OPERATION AND INSTALL A EF&EE SCR SYSTEM WITH AN INTEGRAL OXIDATION CATALYST INSTEAD OF A MIRATECH SCR SYSTEM AND OXIDATION CATALYST (REISSUED 10/28/09)

CONDITIONS

1. All equipment shall be maintained in good operating condition and shall be operated per the manufacturer's specifications to minimize emissions of air contaminants into the atmosphere. [District Rule 2201]
2. No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
3. 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]
4. Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
5. The engine shall be fired only on dairy digester gas. [District Rules 2201 and 4801]
6. This engine shall be equipped with an operational non-resettable elapsed time meter. [District Rules 2201 and 4702]
7. The H2S content of the digester gas used as a fuel in the engine shall not exceed 50 ppmv. [District Rules 2201 and 4801]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (209) 557-6400 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.

Seyed Sadredin, Executive Director / APCO

DAVID WARNER, Director of Permit Services
N-6311-9-1 : Oct 28 2009 3:02PM - NORMANR : Joint Inspection NOT Required

8. Emissions from this IC engine shall not exceed any of the following limits: 0.15 g-NOx/bhp-hr (= 11 ppmvd NOx @ 15% O₂; NOx referenced as NO₂), 1.75 g-CO/bhp-hr (= 210 ppmvd CO @ 15% O₂), 0.13 g-VOC/bhp-hr (= 28 ppmvd VOC @ 15% O₂), 0.036 g-PM₁₀/bhp-hr. [District Rules 2201 and 4702]
9. Note on NOx BACT Limit: The applicant proposed to meet a NOx emission limit of 0.6 g/bhp-hr as this is a vendor-guaranteed emission rate. The applicant has also agreed to the trial installation of catalytic controls on the engine (if necessary) to reduce NOx emissions to a target level of 0.15 g/bhp-hr. Catalytic controls have not yet been successfully demonstrated on an engine fueled solely on dairy biogas. Therefore, if the catalytic control technology does not perform satisfactorily during the initial trial period or experiences repeated failures that are not the result of improper operation, this technology will not be deemed BACT for this particular installation. [District Rule 2201]
10. NOx emissions (as NO₂) from the engine in excess of 0.15 g/bhp-hr shall not constitute a violation of this permit provided that NOx emissions are limited to the lowest achievable emission rate to satisfy BACT. BACT for NOx from this engine shall consist of all other emission limitations and operational and design conditions contained in this permit. The final BACT level for NOx shall be determined to the satisfaction of the Air Pollution Control Officer in accordance with District Rule 2201 and the District's BACT policy, after 24 months of operating history and a successful compliance source test. [District Rule 2201]
11. If NOx emissions from the engine continue to exceed 0.15 g/bhp-hr after the 24-month BACT determination period, the permittee shall have 90 days to submit a report containing all monitoring and source test information to the District. The report shall also include an explanation of the steps taken to operate and maintain the engine in such a manner as to minimize NOx emissions and a detailed analysis of all factors that prohibit compliance with the NOx emissions limit. In the report, the permittee may also propose a final BACT emission limit for NOx for inclusion in this permit. The monitoring data and source test information gathered in accordance with this permit may be shared with other technical experts so their input can be considered when determining the final BACT limit for NOx that can be consistently achieved. [District Rule 2201]
12. The District shall establish the final BACT limit for NOx, including any applicable averaging periods, and revise the applicable limit contained in the permit within 90 days of the successful completion of the BACT determination period or receipt of the report from the permittee. Within 30 days of receipt of the District's determination, the permittee shall submit an Authority to Construct application to incorporate the revised emissions limit(s). In no case shall the final BACT NOx emission limitation be higher than 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O₂). If NOx emissions do not exceed 0.60 g-NOx/bhp-hr, the engine shall be allowed to continue to operate after the BACT evaluation period has ended and before the new Authority to Construct permit has been issued. [District Rule 2201]
13. If the engine demonstrates reasonably reliable compliance with the NOx emissions limit of 0.15 g/bhp-hr during the BACT evaluation period, this limit shall be deemed BACT for the installation. [District Rule 2201]
14. The addition of the external emission control technology will be designed or reviewed and signed by a California Licensed Professional Engineer with experience in the design and/or installation of catalytic controls on IC engines and reviewed and approved by District staff. The approved configuration shall remain substantially the same for the first two years of operation with minor adjustments, if required, to the configuration. [District Rule 2201]
15. The temperature of the SCR catalyst shall be maintained within the range for the highest efficiency for NOx reduction as specified by the catalyst manufacturer or emission control supplier. [District Rules 2201 and 4702]
16. The inlet and outlet 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]
17. 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]
18. The ammonia (NH₃) emissions shall not exceed 10 ppmvd @ 15% O₂. [District Rule 2201]
19. For monitoring purposes, source testing to measure NOx and CO emissions from this unit shall be conducted within 90 days of initial start-up. Official source testing to demonstrate compliance with NOx, CO, VOC, and NH₃ emissions limits from this unit shall be conducted between 20 and 24 months after initial start-up and at least once every 12 months thereafter. [District Rules 1081, 2201, and 4702]

CONDITIONS CONTINUE ON NEXT PAGE

20. 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]
21. For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. 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 methane. VOC, NO_x, and CO concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rules 2201 and 4702]
22. The following methods shall be used for testing: NO_x (ppmv) - EPA Method 7E or ARB Method 100, CO (ppmv) - EPA Method 10 or ARB Method 100, VOC (ppmv) - EPA Method 25A or 25B, or ARB Method 100, stack gas oxygen - EPA Method 3 or 3A or ARB Method 100, and ammonia - BAAQMD ST-1B. EPA-approved alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702]
23. Compliance demonstration (official source testing) shall be District witnessed, or authorized and samples shall be collected by a California Air Resources Board certified testing laboratory. Source testing shall be conducted using the methods and procedures approved by the District. Source testing may occur more frequently than once every 12 months at the discretion of the equipment owner or operator, if such frequency is necessary to schedule source testing during normal operating periods. Any source testing conducted more frequently than required, shall reset the 12 month testing clock. [District Rule 1081]
24. 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]
25. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081]
26. The H₂S content of the digester gas used to fuel the engine shall be monitored and recorded monthly. Monitoring of the H₂S content of the digester gas shall be scheduled for days in which NO_x emissions are being measured or monitored. After six (6) consecutive monthly tests show compliance, the digester gas H₂S content monitoring frequency may be reduced to once every calendar quarter. If quarterly monitoring shows a violation of the digester gas H₂S content limit of this permit, then monthly monitoring shall resume and continue until six consecutive months of monitoring show compliance with the digester gas H₂S content limit. Once compliance with the digester gas H₂S content limit is shown for six consecutive months, then the monitoring frequency may return to quarterly. Monitoring of the H₂S content of the digester gas fuel shall not be required if the engine does not operate during that period. During the BACT determination period for NO_x emissions, monitoring of the digester gas H₂S content shall also be conducted on days when NO_x emissions are found to exceed 0.15 g/bhp-hr. Records of the results of monitoring of the digester gas H₂S content shall be maintained. [District Rule 2201]
27. Monitoring of the digester gas H₂S content of the shall be performed using a Testo 350 XL portable emission monitor; gas detection tubes calibrated for H₂S; District-approved source test methods, including EPA Method 15, ASTM Method D1072, D4084, and D5504; 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 H₂S monitoring system, including the make, model, and detection limits, to the District and obtain District approval for the proposed monitor(s). [District Rule 2201]
28. 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]
29. The permittee shall monitor and record the stack concentration of NO_x, CO, and O₂ at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. 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. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702]

CONDITIONS CONTINUE ON NEXT PAGE

30. Within 90 days of implementation of this ATC, 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 five days of restarting the unit unless monitoring has been performed within the last quarter. [District Rules 2201 and 4102]
31. If the NO_x or CO concentrations corrected to 15% O₂, as measured by the portable analyzer, or the NH₃ concentrations corrected to 15% O₂, as measured by District approved gas-detection tubes, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours of operation after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 8 hours of operation after detection, 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 the performing the notification and testing required by this condition. During the initial 24-month NO_x limit evaluation period, NO_x emissions not exceeding 0.60 g-NO_x/bhp-hr (= 44 ppmvd NO_x @ 15% O₂) are not subject to the requirements contained in this condition to source test or stipulate that an emissions violation has occurred. [District Rules 2201 and 4702]
32. 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 Rules 2201 and 4702]
33. 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, CO, and NH₃ concentrations corrected to 15% O₂, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, (5) the method of determining the NH₃ emission concentration, and (6) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 2201 and 4702]
34. The permittee shall maintain an engine operating log for this engine. The log shall include, on a monthly basis, the total hours of operation, type and quantity of fuel used, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance with District Rule 4702. Quantity of fuel used shall be recorded in standard cubic feet or standard cubic meters using a non-resettable, totalizing mass or volumetric fuel flow meter or other APCO approved-device. [District Rule 4702]
35. Records of biogas analyzer(s) installed to monitor methane, oxygen, and hydrogen sulfide shall be maintained and shall be made available for District inspection upon request. [District Rule 2201]
36. 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. [District Rules 2201 and 4702]
37. 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]
38. This engine shall be operated within the ranges that the source testing has shown result in pollution concentrations within the emissions limits as specified on this permit. [District Rule 4702]
39. 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]

CONDITIONS CONTINUE ON NEXT PAGE

40. 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]
41. 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].
42. Alternate equipment shall be of the same class and category of source as the equipment authorized by the Authority to Construct. [District Rule 2201]
43. 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 firing rate may be authorized for any alternate equipment. [District Rule 2201]



San Joaquin Valley

AIR POLLUTION CONTROL DISTRICT

AUTHORITY TO CONSTRUCT

PERMIT NO: N-6311-10-0

ISSUANCE DATE: 09/21/2007

LEGAL OWNER OR OPERATOR: FISCALINI FARMS & FISCALINI DAIRY
MAILING ADDRESS: 7231 COVERT RD
MODESTO, CA 95358

LOCATION: 4848 JACKSON RD
MODESTO, CA 95358

EQUIPMENT DESCRIPTION:
8829 FT3/HR ENCLOSED BIOGAS FLARE (MUCHE KLÄRANLAGENBAU MODEL FBA 250)

CONDITIONS

1. The flare shall be equipped with automatic ignitor and flame monitoring system. [District Rule 2201]
2. Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
3. 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 1/4 or 5% opacity. [District Rules 2201 and 4101]
4. The H2S content of the digester gas flared shall not exceed 50 ppmv. [District Rules 2201 and 4801]
5. Testing to demonstrate compliance with the fuel H2S content limit of this permit shall be conducted weekly. Once eight (8) consecutive weekly tests show compliance, the fuel H2S content testing frequency may be reduced to once every calendar quarter. If a quarterly test shows a violation of the H2S content limit of this permit, then weekly testing shall resume and continue until eight (8) consecutive tests show compliance. Once compliance is shown on eight (8) consecutive weekly tests, then testing may return to quarterly. [District Rule 2201]
6. H2S content of the fuel shall be measured using either EPA Method 15, ASTM Method D1072, D3031, D4084, D3246, D5504 or with the use of the Testo 350 XL portable analyzer. [District Rule 2201]
7. Flare emissions shall not exceed any of the following: 0.00319 lb-NOx/MMBtu, 0.00053 lb-PM10/MMBtu, 0.03186 lb-CO/MMBtu, or 0.00637 lb-VOC/MMBtu. [District Rule 2201]
8. NOx, CO, and VOC emissions rates shall be measured (source tested) initially within 90 days of startup. [District Rules 1081 and 2201]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (209) 557-6400 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.

Seyed Sadredin, Executive Director / APCO


DAVID WARNER, Director of Permit Services

N-6311-10-0 Sep 21 2007 4:03PM - SRANK Joint Inspection NOT Required

Northern Regional Office • 4800 Enterprise Way • Modesto, CA 95356-8718 • (209) 557-6400 • Fax (209) 557-6475

Printed on recycled paper

9. 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]
10. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081]
11. Records of biogas analyzer installed to monitor methane, carbon dioxide, and hydrogen sulfide shall be maintained and shall be made available for District inspection upon request. [District Rule 2201]
12. Records of daily and annual gas flared shall be maintained for a period of at least five years and made available for District inspection upon request. [District Rules 2201 and 4311]



AUTHORITY TO CONSTRUCT

PERMIT NO: N-6311-10-1

ISSUANCE DATE: 08/15/2011

LEGAL OWNER OR OPERATOR: FISCALINI FARMS & FISCALINI DAIRY
MAILING ADDRESS: 7231 COVERT RD
MODESTO, CA 95358

LOCATION: 4848 JACKSON RD
MODESTO, CA 95358

EQUIPMENT DESCRIPTION:
MODIFICATION OF 8829 FT3/HR ENCLOSED BIOGAS FLARE (MUCHE KLŽRANLAGENBAU MODEL FBA 250);
REVISE EMISSION FACTORS.

CONDITIONS

1. The flare shall be equipped with automatic ignitor and flame monitoring system. [District Rule 2201]
2. No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
3. Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
4. 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 1/4 or 5% opacity. [District Rules 2201 and 4101]
5. The H2S content of the digester gas flared shall not exceed 50 ppmv. [District Rules 2201 and 4801]
6. The H2S content of the digester gas combusted in the flare shall be monitored and recorded monthly. After six (6) consecutive monthly tests show compliance, the digester gas H2S content monitoring frequency may be reduced to once every calendar quarter. If quarterly monitoring shows a violation of the digester gas H2S content limit of this permit, then monthly monitoring shall resume and continue until six consecutive months of monitoring show compliance with the digester gas H2S content limit. Once compliance with the digester gas H2S content limit is shown for six consecutive months, then the monitoring frequency may return to quarterly. Monitoring of the H2S content of the digester gas fuel shall not be required if the flare does not operate during that period. Records of the results of monitoring of the digester gas H2S content shall be maintained. [District Rule 2201]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (209) 557-6400 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.

Seyed Sadredin, Executive Director / APCO

DAVID WARNER, Director of Permit Services
N-8311-10-1, Aug 15 2011 3:41PM - AYABEIJ, Joint Inspection NOT Required

7. Monitoring of the sulfur content of the digester gas shall be performed using a Testo 350 XL portable emission monitor; gas detection tubes calibrated for H₂S; District-approved source test methods, including EPA Method 15, ASTM Method D1072, D4084, and D5504; 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 H₂S monitoring system, including the make, model, and detection limits, to the District and obtain District approval for the proposed monitor(s). [District Rule 2201]
8. Flare emissions shall not exceed any of the following: 0.0426 lb-NO_x/MMBtu, 0.001 lb-PM₁₀/MMBtu, 0.003 lb-CO/MMBtu, or 0.002 lb-VOC/MMBtu. [District Rule 2201]
9. Records of biogas analyzer(s) installed to monitor methane, oxygen, and hydrogen sulfide shall be maintained and shall be made available for District inspection upon request. [District Rule 2201]
10. Records of daily and annual gas flared shall be maintained for a period of at least five years and made available for District inspection upon request. [District Rules 2201 and 4311]
11. ATC N-6311-10-0 shall be implemented and converted into PTO prior to or concurrently with this ATC. [District Rule 2201]

APPENDIX B
Summaries of the 5/12/2015 and 5/20/2014 Engine Source Test Results

RECEIVED

JUL 20 2015

SJVAPCD
NORTHERN REGION

FISCALINI FARMS & FISCALINI DAIRY

Modesto, CA

Compliance Emissions Test Report

Biogas Fired Generator

PM₁₀, Ammonia, NO_x, CO, VOC & SO_x Emission Results

[N-6311-9-1]

Test Date(s): May 12, 2015

Report Date: July 8, 2015

Performed and Reported by:

BEST ENVIRONMENTAL (BE)

339 Stealth Court

Livermore, CA 94551

<http://bestenvironmentalonline.com/>

Prepared For:

Fiscalini Farms & Fiscalini Dairy

7231 Covert Road.

Modesto, CA 95358

Attn: John Brenan

For Submittal To:

San Joaquin Valley Unified APCD

4800 Enterprise Way

Modesto, CA 95356

Attn: Scott Van Dyken



San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT



October 15, 2015

Mr. Brian Fiscalini
Fiscalini Farms & Fiscalini Dairy
7231 Covert Rd
Modesto, CA 95358

COPY

RE: FAILURE TO SHOW COMPLIANCE WITHIN EMISSION LIMITS

Dear Mr. Fiscalini,

District staff has received the test report submitted for the permitted equipment listed below for compliance determination with permitted emission limits. Review of the 5/12/2015 test result(s) reveal the equipment to be operating **above** the permitted emission limits.

Permit Number	Unit ID	Actual Emissions	Emission Limit	Pollutant / Units	Exceeded Limits
N-6311-9-1	Bio Gas Fired Engine	1.68	1.75	CO / g/bhp-hr	
N-6311-9-1	Bio Gas Fired Engine	0.69	10	NH3 / ppm	
N-6311-9-1	Bio Gas Fired Engine	0.034	0.15	NOx / g/bhp-hr	
N-6311-9-1	Bio Gas Fired Engine	0.0377	0.036	PM10 / g/bhp-hr	*
N-6311-9-1	Bio Gas Fired Engine	0.86	2.6	SOx / ppm	
N-6311-9-1	Bio Gas Fired Engine	0.057	0.13	VOC / g/bhp-hr	

The above listed equipment is operating out of compliance with permit conditions and/or District Rules. Corrective action has been taken by submittal of an application to increase the PM10 limit.

Should you have questions or require further information, you are encouraged to contact me at the District's Modesto Office. You may contact this office by telephone at (209) 557-6400. Office hours are from 7:30 a.m. to 5:30 p.m., Monday through Thursday and 8:00 a.m. to 5:00 p.m. on alternate Fridays.

Sincerely,

John D. Cadrett
Compliance Manager

SECTION 2. SUMMARY OF RESULTS

2.1. Emission Results

Table 2.1: Biogen Post-catalyst (N-6311-9-1)

Parameter	Average	Allowable Emissions
Ammonia, ppm @ 15% O ₂	0.69	10
NO _x , g/bhp-hr	0.027	0.15
CO, g/bhp-hr	1.682	1.75
VOC, g/bhp-hr	0.057	0.13
SO _x , ppm @ 15% O ₂	0.89	2.6
PM10, g/bhp-hr	0.0377	0.036

A more extensive summary of the emissions is presented in Table 1 following the text.

Table 2.3: Biogas Data (N-6311-9-1)

Laboratory Fuel Analysis

Parameter	Fuel Data
Methane, % CH ₄	63.736
HHV, BTU/cf	643.74
HHV, "F" Factor DSCF/MMBtu @ 68°F	9120.9

A more extensive summary of the fuel analysis presented in Appendix B.

2.2. Process Data

The fuel rate, electric output (load) and urea flow were recorded manually during each test run. The following table summarizes the process parameters.

Table 2.4:

Parameter	Fuel Flow, SCFM	Electrical Output, KW	Urea Injection Rate, l/hr
Run # 1	112.4	450	0.70
Run # 2	111.1	475	0.80
Run # 3	112.6	475	0.70

2.3. Description of collected samples

Following testing all samples are sealed and labeled onsite then placed into pre-labeled containers for shipment.

The Method 18 tedlar bag samples were collected concurrently with the total hydrocarbon emissions testing. Each bag was sealed and labeled. The samples were sent to an air laboratory for analysis by gas chromatograph / Flame Ionization Detection (GC/FID).

Ammonia sampling procedures were performed within the method specifications. Following each compliance test run the samples were measured for volume, collected and labeled respectively. The samples were analyzed in-house using specific ion electrode.

The Front Half Method 5 particulate filter holder was sealed and recovered at the BE Laboratory. The particulate sample probe and nozzle was rinsed with acetone on site following each

TABLE #1
Fiscalini Farms & Fiscalini Dairies
NOx, CO & VOC Emission Results
750KW Engine (N-6311-9-1)
Post-Catalyst

TEST	1	2	3	AVERAGE	LIMIT
Test Location	Outlet	Outlet	Outlet		
Test Date	5/12/2015	5/12/2015	5/12/2015		
Test Time	1052-1122	1152-1222	1238-1308		
Standard Temp., °F	60	60	60		
Exhaust Flow Rate, DSCFM	1,081	1,072	1,083	1,079	
Engine kw	450	475	475	467	
Engine, bhp	635	670	670	658	
O ₂ , %	8.15	8.18	8.14	8.15	
H ₂ O, %	10.81	10.80	11.41	11.01	
NH ₃ , ppm	1.10	1.78	1.59	1.49	
NH ₃ , ppm @ 15% O ₂	0.51	0.83	0.73	0.69	10
NOx, ppm	5.58	4.44	8.75 ✓	6.26	
NOx, ppm @ 15% O ₂	2.58	2.06	4.05	2.90	
NOx, lbs/hr	0.044	0.035	0.069 ✓	0.049	
NOx, lbs/day	1.05	0.83	1.65	1.18	
NOx, g/bhp-hr	0.031	0.023	0.047 ✓	0.034	0.15 ✓
NOx, lbs/MMBtu	0.0099	0.0079	0.0156	0.0111	
CO, ppm	512.95	509.64	509.92	510.84	
CO, ppm @ 15% O ₂	237.27	236.40	235.71	236.46	
CO, lbs/hr	2.46	2.42	2.44	2.44	
CO, lbs/day	58.95	58.05	58.66	58.55	
CO, g/bhp-hr	1.755	1.637	1.654	1.682	1.75
CO, lbs/MMBtu	0.5560	0.5539	0.5523	0.5540	
THC, ppm (M25A)	1540.06	1628.97	1624.82	1597.95	
CH ₄ + C ₂ H ₆ , ppm (M18)	1514.30	1700.00	1608.60	1607.63	
VOC, ppm (M25A-M18)	25.76	<50.00	16.22	30.66	
VOC, ppm @ 15% O ₂	11.91	<23.19	7.50	14.20	
VOC, lbs/hr	0.070	<0.1356	0.044	0.083	
VOC, lbs/day	1.69	<3.254	1.07	2.00	
VOC, g/bhp-hr	0.050	<0.092	0.030	0.057	0.13
VOC, lbs/MMBtu	0.0003	<0.0003	0.0003	0.0003	
SOx, ppm (M6)	1.30	1.88	2.40	1.86	
SOx, ppm @ 15% O ₂	0.60	0.87	1.11	0.86	2.6

* VOC is assumed equal to total non-methane/ethane hydrocarbons.

WHERE:

- NOx = Oxides of Nitrogen (MW=46)
- CO = Carbon Monoxide (MW=28)
- O₂ = Oxygen
- ppm = Parts Per Million Concentration
- kW-hr = kilowatt hour
- BHp-hr = Brake Horsepower hour
- DSCFM = Dry Standard Cubic Feet per Minute
- lbs/MMBtu = Pounds per Million Btu
- lbs/hr = Pound Per Hour Emission Rate
- g/BHp-hr = grams per Brake Horsepower Hour
- Fd = 8710 (EPA F Factor for Natural Gas)
- Tstd. = Standard Temp.; °R = °F + 460
- VOC = Total Non-methane non-ethane Hydrocarbons as CH₄ (MW = 16)

CALCULATIONS:

- 15%O₂ correction = ppm of pollutant * 5.9 / (20.9 - %O₂)
- lbs/MMBtu = Fd * MW * ppm * 2.59E-9 * 20.9 / (20.9 - %O₂)
- BHp-hr = kW-hr * 1.411
- lbs/hr = ppm * DSCFM * MW * 60 / 379 x 106 (@ 60°F)
- g/BHp-hr = lbs/hr * 453.6 / horsepower

Fd = 9120.9

RECEIVED

JUL 21 2014

**SJVAPCD
NORTHERN REGION**

FISCALINI FARMS & FISCALINI DAIRY

Modesto, CA

Compliance Emissions Test Report

Biogas Fired Generator

Ammonia, NOx, CO & VOC Emission Results

[N-6311-9-1]

Test Date(s): May 20, 2014

Report Date: July 8, 2014

Performed and Reported by:

BEST ENVIRONMENTAL (BE)

339 Stealth Court

Livermore, CA 94551

<http://bestenvironmentalonline.com/>

Prepared For:

Fiscalini Farms & Fiscalini Dairy

7231 Covert Road.

Modesto, CA 95358

Attn: John Fiscalini

For Submittal To:

San Joaquin Valley Unified APCD

4800 Enterprise Way

Modesto, CA 95356

Attn: Scott Van Dyken

P.M. 7/18/14

SECTION 2. SUMMARY OF RESULTS

2.1. Emission Results

Table 2.1: Biogen Post-catalyst (N-6311-9-1)

Parameter	Average	Allowable Emissions
Ammonia, ppm @ 15% O ₂	0.91	10
NOx, ppm @ 15% O ₂	2.53	11
NOx, g/bhp-hr	0.026	0.15
CO, ppm @ 15% O ₂	108.25	210
CO, g/bhp-hr	0.68	1.75
VOC, ppm @ 15% O ₂	<0.22	28
VOC, g/bhp-hr	<0.001	0.13

A more extensive summary of the emissions is presented in Table 1 following the text.

Table 2.3: Biogas Data (N-6311-9-1)

Laboratory Fuel Analysis

Parameter	Fuel Data
Methane, % CH ₄	62.145
HHV, BTU/cf @ 68°F	618.49
HHV, "F" Factor DSCF/MMBtu @ 68°F	9095.0

A more extensive summary of the fuel analysis presented in Appendix B.

2.2. Process Data

The fuel rate, electric output (load) and urea flow were recorded manually during each test run. The following table summarizes the process parameters.

Table 2.4:

Parameter	Fuel Flow, SCFM	Electrical Output, KW	Urea Injection Rate, l/hr
Run # 1	36.26	188	0.21
Run # 2	43.08	188	0.21
Run # 3	46.11	189	0.21

2.3. Description of collected samples

Following testing all samples are sealed and labeled onsite then placed into pre-labeled containers for shipment.

The Method 18 tedlar bag samples were collected concurrently with the total hydrocarbon emissions testing. Each bag was sealed and labeled. The samples were sent to an air laboratory for analysis by gas chromatograph / Flame Ionization Detection (GC/FID).

Ammonia sampling procedures were performed within the method specifications. Following each compliance test run the samples were measured for volume, collected and labeled respectively. The samples were analyzed in-house using specific ion electrode.

A Chain of Custody (COC) was filled out for all samples to ensure proper handling and analysis. More information on the analysis and the samples can be found in Appendix B.

2.4. Allowable Emissions

See Table 2.1 above. The test results show that the biogen post-catalyst emissions are within the permitted emission limits.

2.5. Comments: Discussion of Quality Assurance and Errors

Quality assurance procedures listed in the above referenced test methods and referenced in the Source Test Plan are performed and documented. The QA/QC procedures are described in Section 4.3 of the report. Documentation of the QA/QC is provided in Appendix A, B, E & F.

The EPA Method 25A total hydrocarbon concentration results were inconclusive when combined with EPA Method 18 methane and ethane concentrations for all three runs. However the Method 18 analytical results show non-detect VOC for all three runs and assuming the Run 2 bag sample was leaking, the average of Runs 1 and 3 total hydrocarbons for Method 18 were within ~1% of the average total hydrocarbon results for Method 25A. VOC is assumed equal to total non-methane non-ethane hydrocarbons as reported by EPA Method 18.

TABLE #1
Fiscalini Farms & Fiscalini Dairy
NOx, CO & VOC Emission Results
750KW Biogen (N-6311-9-1)
Post-Catalyst

TEST	1	2	3	AVERAGE	LIMIT
Test Location	Outlet	Outlet	Outlet		
Test Date	5/20/2014	5/20/2014	5/20/2014		
Test Time	0936-1006	1020-1050	1111-1144		
Standard Temp., °F	60	60	60		
Exhaust Flow Rate, DSCFM	320	380	405	368	
Engine kw	188	188	189	188	
Engine, bhp	265	265	267	266	
O ₂ , %	7.58	7.59	7.51	7.56	
H ₂ O, %	10.19	11.28	11.22	10.90	
NH ₃ , ppm	0.99	2.63	2.52	2.05	
NH ₃ , ppm @ 15% O ₂	0.44	1.17	1.11	0.91 ✓	10
NOx, ppm	5.41	5.69	6.05	5.72	
NOx, ppm @ 15% O ₂	2.40	2.52	2.66	2.53	11
NOx, lbs/hr	0.013	0.016	0.018	0.015 ✓	
NOx, lbs/day	0.30	0.38	0.43	0.37	
NOx, g/bhp-hr	0.022	0.027	0.030	0.026 ✓	0.15
NOx, lbs/MMBtu	0.0092	0.0097	0.0102	0.0097	
CO, ppm	247.82	245.26	241.36	244.81	
CO, ppm @ 15% O ₂	109.74	108.68	106.33	108.25	210 ✓
CO, lbs/hr	0.35	0.41	0.43	0.40	
CO, lbs/day	8.43	9.91	10.38	9.57	
CO, g/bhp-hr	0.60	0.71	0.74	0.68	1.75
CO, lbs/MMBtu	0.2564	0.2539	0.2484	0.2529	
THC, ppm	2003.94	1983.31	1732.64	1906.63	
CH ₄ + C ₂ H ₆ , ppm	1913.70	883.80	1942.20	1579.90	
VOC, ppm (M25A)	90.24	1099.51	-209.56	326.73	
VOC, ppm (M18)	<0.50	<0.50	<0.50	<0.50	
VOC, ppm @ 15% O ₂	<0.22	<0.22	<0.22	<0.22	28 ✓
VOC, lbs/hr	<0.0004	<0.0005	<0.0005	<0.0005	
VOC, lbs/day	<0.010	<0.012	<0.012	<0.011	
VOC, g/bhp-hr	<0.001	<0.001	<0.001	<0.001	0.13
VOC, lbs/MMBtu	<0.0003	<0.0003	<0.0003	<0.0003	

*EPA Method 25A THC results were lower than EPA Method 18 methane/ethane. VOC determined by EPA Method 18.

WHERE:

NOx = Oxides of Nitrogen (MW=46)

CO = Carbon Monoxide (MW=28)

O₂ = Oxygen

ppm = Parts Per Million Concentration

kW-hr = kilowatt hour

BHp-hr = Brake Horsepower hour

DSCFM = Dry Standard Cubic Feet per Minute

lbs/MMBtu = Pounds per Million Btu

Fd = 8710 (EPA F Factor for Natural Gas)

Tstd. = Standard Temp.; °R = °F + 460

VOC = Total Non-methane non-ethane Hydrocarbons as CH₄ (MW = 16)

CALCULATIONS:

15%O₂ correction = ppm of pollutant * 5.9 / (20.9 - %O₂)

lbs/MMBtu = Fd * MW * ppm * 2.59E-9 * 20.9 / (20.9 - %O₂)

BHp-hr = kW-hr * 1.411

lbs/hr = ppm * DSCFM * MW * 60 / 379 x 106 (@ 60°F)

g/BHp-hr = lbs/hr * 453.6 / horsepower

Fd = 9095

APPENDIX C
Summary of the 11/17/2010 Flare Source Test Results

SECTION 2. SUMMARY OF RESULTS

2.1. Emission Results

Table 2.1: Flare N-6311-10-0

Parameter	Flare Average	Allowable Emissions
NO _x , lbs/MMBtu	0.0426	0.00319
CO, lbs/MMBtu as methane	0.0022	0.03186
VOC, lbs/MMBtu as methane	0.0023	0.00637

A more extensive summary of the emissions is presented in Table 1 following the text.

2.2. Process Data

The fuel rate was recorded manually during each test run. The following table summarizes the process parameters.

Table 2.2:

Parameter	Fuel Flow, SCFM
Run # 1	78.9
Run # 2	79.7
Run # 3	79.11

2.3. Allowable Emissions

See Table 2.1 above. The test results show that the flare's outlet NO_x emissions are above the permitted emission limit. The CO and VOC emissions are in compliance with the emissions limits shown in the ATC.

2.4. Comments: Discussion of Quality Assurance and Errors

Quality assurance procedures listed in the above referenced test methods and referenced in the Source Test Plan are performed and documented. The QA/QC procedures are described in Section 4.3 of the report. Documentation of the QA/QC is provided in Appendix A, B, E & F.

VOC is assumed equal to total hydrocarbons (THC). THC was determined at the exhaust using a direct flame ionization detector (FID) by EPA Method 25A.

SECTION 3. SOURCE OPERATION

3.1. Process Description

Fiscalini Farms operates one digester gas fired flare. The flare is a control device for the treatment of excess digester gas (mainly methane, carbon dioxide and nitrogen) that is generated from the treatment of wastewater.

3.2. Flow Diagram

A digital image of the stack is contained in Appendix G.

3.3. Process and control operating parameters during testing

The gas flow was determined from the totalizing standard gas meter and was converted from metric to English units using a factor of 35.317.

3.4. Normal Operating Parameters

The flare was operated normally during the test periods.

3.5. Testing or Process interruptions and changes

Due to high heat near the stack, official testing could not begin until proper facilities were provided to access the stack emissions. The stack emissions were monitored from a single point prior to this. Once testing began, there were no process or testing interruptions.

TABLE #1
Fiscalini Farms
NOx, CO & VOC Emissions Results
Flare Outlet (N-6311-10-0)

TEST	1	2	3	AVERAGE	LIMIT
Test Location	Outlet	Outlet	Outlet		
Test Date	11/17/10	11/17/10	11/17/10		
Test Time	1214-1249	1324-1358	1411-1445		
Standard Temp., °F	60	60	60		
Fuel F-Factor, DSCF/MMBtu @ 60°F	9376.5	9372.7	9374.7		
Inlet Methane (CH ₄) Content, %	47.5%	48.2%	45.2%		
Inlet Fuel Flow Rate, DSCFM	79	80	79	79	
Outlet Flow Rate, DSCFM	708	688	651	682	
O ₂ , %	10.53	9.97	9.41	9.97	
H ₂ O, %	12.05	12.52	12.28	12.28	
NOx, ppm	18.72	19.89	20.08	19.56	
NOx, lbs/hr	0.096	0.099	0.095	0.097	
NOx, lbs/day	2.31	2.39	2.28	2.33	0.0426*
NOx, lbs/MMBtu	0.0430	0.0433	0.0416	0.0426	0.00319
CO, ppm	1.72	1.47	1.81	1.67	
CO, lbs/hr	0.005	0.004	0.005	0.005	
CO, lbs/day	0.13	0.11	0.12	0.12	0.003*
CO, lbs/MMBtu	0.0024	0.0020	0.0023	0.0022	0.03186
THC, ppm as methane (Wet)*	2.97	1.76	3.13	2.62	
VOC, ppm as methane (Dry)*	3.38	2.01	3.57	2.99	
VOC, ppm @ 3% O ₂ as Methane	5.84	3.30	5.56	4.90	
VOC, lbs/hr as methane	0.006	0.004	0.006	0.005	
VOC, lbs/day as methane	0.15	0.08	0.14	0.12	0.002*
VOC, lbs/MMBtu as methane	0.0027	0.0015	0.0026	0.0023	0.00637

* All THC is assumed to be VOC

WHERE:

- MW = Molecular Weight
- DSCFM = Dry Standard Cubic Feet Per Minute
- ppm = Parts Per Million Concentration
- lbs/hr = Pound Per Hour Emission Rate
- CO = Carbon Monoxide (MW = 28)
- NOx = Oxides of Nitrogen as NO₂ (MW = 46)
- THC = Total Hydrocarbons as Methane (MW = 16)
- VOC = Total Non-Methane Hydrocarbons as Methane (MW = 16) CH₄
- lbs/MMBtu = Pounds per million BTU

* Limit was revised under
 ATC N-6311-10-1.

CALCULATIONS:

- lbs/hr = ppm * MW * DSCFM * 60 / 379E6 (Tstd 60°F)
- lbs/day = lbs/hr * 24
- Removal Efficiency = (inlet lbs/hr-outlet lbs/hr) / Inlet lbs/hr
- ppm @ 3% O₂ = ppm * 17.9 / (20.9 - stack O₂)
- lbs/MMBtu @ 60°F = Fd * M.W. * ppm * 2.64E-9 * (20.9 / (20.9 - %O₂))
- ppm dry = ppm wet * (100 / (100 - H₂O%))

APPENDIX D
Quarterly Net Emissions Change (QNEC)

Quarterly Net Emissions Change (QNEC)

The Quarterly Net Emissions Change is used to complete the emission profile screen for the District's PAS database. The QNEC shall be calculated as follows:

QNEC = PE2 - PE1, where:

- QNEC = Quarterly Net Emissions Change for each emissions unit, lb/qtr.
- PE2 = Post Project Potential to Emit for each emissions unit, lb/qtr.
- PE1 = Pre-Project Potential to Emit for each emissions unit, lb/qtr.

Using the values in Sections VII.C.2 and VII.C.1 in the evaluation above, quarterly PE2 and quarterly PE1 can be calculated as follows:

N-6311-9-2 (1,057 bhp Digester Gas-Fired, Lean Burn, IC engine)

PE1 (lb/qtr) N-6311-9-2					
	PE1 (lb/year)	÷	4 qtr/year	=	PE1 (lb/qtr)
NO _x	0	÷	4 qtr/year	=	0.0
SO _x	0	÷	4 qtr/year	=	0.0
PM ₁₀	0	÷	4 qtr/year	=	0.0
CO	0	÷	4 qtr/year	=	0.0
VOC	0	÷	4 qtr/year	=	0.0

PE2 (lb/qtr) N-6311-9-2					
	PE2 (lb/year)	÷	4 qtr/year	=	PE2 (lb/qtr)
NO _x	3,062	÷	4 qtr/year	=	765.5
SO _x	817	÷	4 qtr/year	=	204.3
PM ₁₀	730	÷	4 qtr/year	=	182.5
CO	44,910	÷	4 qtr/year	=	11,227.5
VOC	2,041	÷	4 qtr/year	=	510.3

Quarterly NEC [QNEC] N-6311-9-2					
	PE2 (lb/qtr)	-	PE1 (lb/qtr)	=	NEC (lb/qtr)
NO _x	765.5	-	0.0	=	765.5
SO _x	204.3	-	0.0	=	204.3
PM ₁₀	182.5	-	0.0	=	182.5
CO	11,227.5	-	0.0	=	11,227.5
VOC	510.3	-	0.0	=	510.3

N-6311-10-2 (8,829 ft³/hr Digester System Backup Flare)

PE1 (lb/qtr) N-6311-10-2					
	PE1 (lb/year)	÷	4 qtr/year	=	PE1 (lb/qtr)
NO _x	0	÷	4 qtr/year	=	0.0
SO _x	0	÷	4 qtr/year	=	0.0
PM ₁₀	0	÷	4 qtr/year	=	0.0
CO	0	÷	4 qtr/year	=	0.0
VOC	0	÷	4 qtr/year	=	0.0

PE2 (lb/qtr) N-6311-10-2					
	PE2 (lb/year)	÷	4 qtr/year	=	PE2 (lb/qtr)
NO _x	545	÷	4 qtr/year	=	136.3
SO _x	1,632	÷	4 qtr/year	=	408.0
PM ₁₀	174	÷	4 qtr/year	=	43.5
CO	35	÷	4 qtr/year	=	8.8
VOC	35	÷	4 qtr/year	=	8.8

Quarterly NEC [QNEC] N-6311-10-2					
	PE2 (lb/qtr)	-	PE1 (lb/qtr)	=	NEC (lb/qtr)
NO _x	136.3	-	0.0	=	136.3
SO _x	408.0	-	0.0	=	408.0
PM ₁₀	43.5	-	0.0	=	43.5
CO	8.8	-	0.0	=	8.8
VOC	8.8	-	0.0	=	8.8

APPENDIX E

BACT Analysis for Digester Gas-Fired IC Engine

SJVAPCD Best Available Control Technology (BACT) Guideline 3.3.15*
 Last Update: 3/6/2013

Waste Gas-Fired IC Engine**

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
NO _x	0.15 g/bhp-hr (lean-burn engine with SCR, rich-burn engine with 3-way catalyst, or other equivalent)		1. Fuel Cells (<0.05 lb/MW-hr) 2. Microturbines (<9 ppmv @ 15% O ₂) 3. Gas Turbine (<9 ppmv @ 15% O ₂) (Note: gas turbines only ABE for projects ≥ 3 MW)
SO _x	Sulfur content of fuel gas ≤ 40 ppmv (as H ₂ S) (dry absorption, wet absorption, chemical H ₂ S reduction, water scrubber, or equivalent) (may be averaged up to 24 hours for compliance)		
PM ₁₀	Sulfur content of fuel gas ≤ 40 ppmv (as H ₂ S)		
CO	2.0 g/bhp-hr		1. Fuel Cells (<0.10 lb/MW-hr) 2. Microturbines (<60 ppmv @ 15% O ₂) 3. Gas Turbine (<60 ppmv @ 15% O ₂) (Note: gas turbines only ABE for projects ≥ 3 MW)
VOC	0.10 g/bhp-hr (lean burn and positive crankcase ventilation (PCV) or a 90% efficient crankcase control device or equivalent)		Fuel Cells (<0.02 lb-VOC/MW-hr as CH ₄)
Ammonia (NH ₃) Slip	≤ 10 ppmv @ 15% O ₂		

** For the purposes of this determination, waste gas is a gas produced from the digestion of material excluding municipal sources such as waste water treatment plants, landfills, or any source where siloxane impurities are a concern.

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 - Permit Specific BACT Determinations on Next Pages**

3.3.15

Top-Down BACT Analysis for Project N-1153078 Digester Gas-Fired IC Engine

Current District BACT Guideline 3.3.15 applies to the waste gas-fired IC engine. In accordance with the District BACT policy, information from District BACT Guideline 3.3.15 will be utilized for the BACT analysis for the digester gas-fired engine evaluated under this project.

I. Proposal and Process Description

Fiscalini Farms and Fiscalini Dairy has requested an Authority to Construct (ATC) permit for a Guascor 1,057 bhp combined heat and power (CHP) digester gas-fired IC engine powering an electrical generator (ATC N-6311-9-2) at Fiscalini Farms and Fiscalini Dairy. The digester gas-fired engine is a Guascor Model SFGLD 560 lean burn engine with a maximum rating of 1,057 bhp that powers an electrical generator rated at 750 kWe. When operating on digester gas, the engine generator set produces a maximum of 710 kWe. The engine is equipped with a selective catalytic reduction (SCR) system for control of NO_x. The digester tanks utilize an air injection system for biological removal of H₂S from the digester gas. After removal of H₂S in the digester tanks, the digester gas is collected by the digester tank gas collection system and is piped to the gas conditioning system for removal of moisture. The digester gas, which consists mostly of methane, the main component of natural gas, is then sent to the engine for use as fuel to generate electricity that is sold to a utility (Modesto Irrigation District (MID)), and to produce heat for the digester tanks and a cheese plant located on the dairy.

As discussed in the project evaluation, the facility asserts that the majority of SO_x formed during combustion of the digester gas in the engine is not emitted in the exhaust because it reacts with excess ammonia from the SCR system to form sulfur particulate (e.g. ammonium sulfate). When the exhaust is cooled as it passes through the heat recovery boiler, the sulfur particulate is also cooled and adheres to surfaces and is deposited in the heat recovery boiler, from where it is removed when the heat recovery boiler is periodically cleaned.

II. BACT Applicability

New emissions units – PE > 2.0 lb/day

New Emissions Unit BACT Applicability for N-6311-9-2				
Pollutant	PE2 for each unit after commissioning (lb/day)	BACT Threshold (lb/day)	SSPE2 (lb/yr)	BACT Triggered?
NO _x	8.4	> 2.0	N/A	Yes
SO _x	2.2	> 2.0	N/A	Yes
PM ₁₀	2.0	> 2.0	N/A	No
CO	123.0	> 2.0 and SSPE2 ≥ 200,000 lb/yr	45,156	No
VOC	5.6	> 2.0	N/A	Yes
NH ₃	2.8	> 2.0	N/A	Yes

* BACT is not required for CO from a new or modified emissions unit at a Stationary Source with an SSPE2 of less than 200,000 pounds per year of CO.

III. Top-Down BACT Analyses for the Digester Gas-Fired Engines

As stated above, the information from the existing District BACT Guideline 3.3.15 for Waste Gas-Fired IC Engines will be utilized for the BACT analysis for the digester gas-fired IC engine evaluated under this project.

1. BACT Analysis for NO_x Emissions:

a. Step 1 - List all control technologies

District BACT Guideline 3.3.15 lists the following options to reduce NO_x emissions from waste gas-fired IC engines:

- 1) NO_x emissions ≤ 0.15 g/bhp-hr (lean-burn engine with SCR, rich-burn engine with 3-way catalyst, or other equivalent) (Achieved in Practice)
- 2) Fuel Cell (≤ 0.05 lb/MW-hr) (Alternate Basic Equipment)
- 3) Microturbine (< 9 ppmv NO_x @ 15% O₂) (Alternate Basic Equipment)
- 4) Gas Turbine (< 9 ppmv NO_x @ 15% O₂) (Alternate Basic Equipment)

Description of Control Technologies

- 1) **NO_x emissions ≤ 0.15 g/bhp-hr (9-11 ppmv NO_x @ 15% O₂) (Selective Catalytic Reduction (SCR) or equivalent) (Achieved in Practice)**

A Selective Catalytic Reduction (SCR) system operates as an external control device where flue gases and a reagent (e.g. urea or ammonia) are passed through an appropriate catalyst. The reagent is used to reduce NO_x, over the catalyst bed, to form elemental nitrogen, water vapor, and other by-products. The use of a catalyst typically reduces the NO_x emissions by up to 90%.

- 2) **Fuel Cell (≤ 0.05 lb- NO_x/MW-hr ≈ 1.5 ppmv NO_x @ 15% O₂) (Alternate Basic Equipment)**

Fuel cells use an electrochemical process to produce a direct electric current without the combustion of fuel. Fuel cells use externally supplied reactant gases (hydrogen and oxygen) that are combined in a catalytic process. Like a battery, the electric potential generated by a fuel cell is accessed by connecting an external load to the anode and cathode plates of the fuel cell. Because the fuel for a fuel cell is supplied externally, it does not run down like a battery. However, the fuel cell stack must be periodically replaced because of deactivation of catalytic materials contained in the fuel cell, which results in reduced conversion efficiencies. Since fuel cells require pure hydrogen gas for fuel, hydrocarbons used to power fuel cells must be purified and reformed prior to use. The reformation process can occur in an external fuel processor or through internal reforming in the fuel cell. Both molten carbonate fuel cells and solid oxide fuel cells can internally reform the hydrocarbon fuel to hydrogen for use in the fuel cell. Additionally, these high temperature fuel cells are tolerant of CO₂ that is found in biogas.

Fuel cells have recently been commercialized and offer the advantages of high efficiency, nearly negligible emissions, and very quiet power generation. The greatest deterrent to increased use of fuel cells is the significantly higher expense when compared to other generation technologies. These higher costs include the initial capital expense and, for biogas installations, the increased ongoing expenses associated with the extensive cleanup required to remove contaminants that can poison fuel cell catalysts. Although this expense can be substantial, biogas-fueled fuel cells have been installed at some wastewater treatment plants and fuel cells have also been fueled with other types of biogas (e.g. landfill gas and brewery wastewater gas).

3) Gas Turbine (< 9 ppmv NO_x @ 15% O₂) (Alternate Basic Equipment)

Gas turbines are internal combustion engines that operate on the Brayton (Joule) combustion cycle rather than the Otto combustion cycle used in reciprocating internal combustion engines or the diesel cycle for diesel engines. In the Brayton cycle the air flow and fuel injection are steady, and the different parts of the cycle occur continuously within different components of the system. In a gas turbine, fuel is continually injected into the combustion chamber or combustor and air is constantly drawn into the turbine and compressed. All elements of the Brayton cycle occur simultaneously in a gas turbine.

Gas turbines are one of the cleanest means of generating electricity. With the use of lean pre-mixed combustion or catalytic exhaust cleanup, NO_x emissions from large gas-fired turbines are generally in the single-digit ppmv range. These levels are generally for natural gas-fired units but they are considered technologically feasible for biogas-fired units.

Gas turbines are available in sizes ranging from 500 kW - 25 MW. Based on contacts with turbine suppliers, biogas-fired turbines used to produce electricity are expected to be available in the size range of 2 - 7 MW. According to Solar Turbines, the smaller biogas-fired turbines are no longer actively produced or marketed since this size range is generally covered by other generation technologies such as reciprocating IC engines and microturbines.

4) Microturbine (< 9 ppmv NO_x @ 15% O₂) (Alternate Basic Equipment)

Microturbines are small gas turbines rated between 25 kW and 500 kW that burn gaseous and liquid fuels to generate electricity or provide mechanical power. Microturbines were developed from turbocharger technologies found in large trucks and the turbines in aircraft auxiliary power units. Microturbines can be operated on a wide variety of fuels, including natural gas, liquefied petroleum gas, gasoline, diesel, landfill gas, and digester gases. According to the California Air Resources Board (ARB), there were approximately 200 biogas-fired microturbines operating in California as of the year 2006.³ Microturbines generally have electrical efficiencies

³ "Staff Report: Initial Statement of Reasons for Proposed Amendments to the Distributed Generation Certification Regulation" (9/1/2006), Cal EPA - ARB, Executive Summary Pg. ii (<http://www.arb.ca.gov/regact/dg06/dgisor.pdf>)

of 25-30%; however, the electrical efficiency of larger microturbines (≥ 200 kW) can range from 30-33%. Microturbine manufacturers include Capstone Microturbines and FlexEnergy.

Microturbines without add-on controls can meet very stringent emission limits and have significantly lower emissions of NO_x , CO, and VOC than uncontrolled reciprocating engines because most microturbines operating on gaseous fuels utilize lean premixed (dry low NO_x , or DLN) combustion technology. Microturbines manufacturers will generally guarantee NO_x emissions of 9-15 ppmv @ 15% O_2 . However, several emission tests performed on biogas-fired microturbines have demonstrated even lower emissions. A small number of dairy digester gas-fired microturbines have been installed⁴, including Twin Birch Dairy and New Hope Farm View dairy and Twin Birch Dairy in New York, and den Dulk Dairy in Michigan.

b. Step 2 - Eliminate options

The Alternate Basic Equipment BACT Options for NO_x : Fuel Cells, Gas Turbines, and Microturbines will be removed for consideration for this project.

ATC Permit N-6311-9-0 was originally issued for the engine being evaluated under this project on September 21, 2007 under Project N-1072585 and the engine was installed at the facility in 2008. Revised ATC Permit N-6311-9-1 was reissued under Project N-1083706 to incorporate a flexible BACT emission limit for NO_x . The previous ATC permits for the engine (N-6311-9-0 & -9-1) could not be fully implemented (primarily because of exceeding the required digester fuel sulfur limit); therefore, the engine will be treated as a new unit installed without a valid ATC for purposes of this BACT analysis.

District FYI 98 (Revised November 15, 2004) – “BACT for Equipment Installed without an ATC” contains the following directions for evaluating equipment installed without an ATC: 1) If the equipment was installed without BACT (i.e., BACT at the time of installation), the District must perform a complete current BACT analysis, exactly as if it were a new proposal; 2) If the equipment was installed with BACT (i.e., BACT at the time of installation), or if BACT did not exist at the time of installation, the current BACT analysis is limited to the types of controls that can be applied to the SPECIFIC equipment that was already installed.

Previous BACT Guideline 3.3.13 - Waste Gas Fired IC Engine > 50 hp (rescinded 8/22/2008) required digester gas-fired IC engines to satisfy Achieved in Practice BACT for NO_x with one of the following emission limits: 50 ppmvd @ 15% O_2 , 0.6 g/bhp-hr, or 1.9 lb/MW-hr. BACT Guideline 3.3.13 did not contain any Technologically Feasible or Alternative Basic Equipment BACT options for NO_x . Original ATC Permit N-6311-9-0 for the engine required a NO_x emission limit of 9 ppmv @ 15% O_2 , which was determined to be Achieved in Practice BACT for dairy digester gas-fired IC engines under Project N-1072585. The BACT evaluation performed for Project N-1072585 did not contain any Technologically Feasible BACT options for NO_x and, for Alternative

⁴ See EPA AgStar Program “AgStar Project Profiles”, <http://www2.epa.gov/agstar/agstar-project-profiles>

Basic Equipment, indicated that biogas injection into the natural gas pipeline network “shall be considered only if onsite power generation is not primary purpose.” The evaluation for Project N-1072585 indicated that the 9 ppmv NO_x @ 15% O₂ emission limit was equivalent to 0.135 g-NO_x/bhp-hr; however, other District evaluations and permits have indicated that the 9 ppmv NO_x @ 15% O₂ may be as high as 0.15 g-NO_x/bhp-hr. Installation of an SCR system on the engine was proposed to meet this limit. After issuance of the original ATC permit and installation of the engine, it was subsequently discovered that the dairy digester gas-fired engine on which the 9 ppmv NO_x @ 15% O₂ limit had been based had not been consistently meeting this limit, so the District rescinded the determination that 9 ppmv NO_x @ 15% O₂ was Achieved in Practice BACT for biogas-fired engines. However, the District determined that this emission limit remained technologically feasible. Revised ATC Permit N-6311-9-1 was then issued for the engine allowing a flexible NO_x BACT emission limit. ATC N-6311-9-1 required installation of an SCR system with a target of reducing NO_x emissions to 0.15 g/bhp-hr (= 11 ppmv NO_x @ 15% O₂), but would allow emissions up to the previous BACT limit for NO_x of 0.6 g/bhp-hr provided that satisfactory efforts were made to reduce NO_x to 0.15 g/bhp-hr.

The engine being evaluated, which was installed in 2008, is equipped with an SCR system and source testing has demonstrated compliance with the 0.15 g/bhp-hr NO_x emission limit. Therefore, it has been determined that the engine satisfies the BACT for NO_x that was required the time the engine was installed. In accordance with District FYI 98, only controls that can be applied to the specific engine will be considered in this BACT analysis and the Alternate Basic Equipment BACT options for NO_x (i.e. Fuel Cells, Gas Turbines, and Microturbines) will be removed for consideration for this project.

In addition for gas turbines, information from other digester gas engine projects indicates that the principal suppliers of gas turbines (Solar Turbines, Allison, and General Electric) do not currently produce or market waste gas-fired gas turbines rated less than 3 MW. The project would require a gas turbine rated 1,057 kW, which is below the range that is currently being marketed by turbine manufacturers; therefore, even if considered, a gas turbine of this size would not be available.

c. Step 3 - Rank remaining options by control effectiveness

- 1) NO_x emissions ≤ 0.15 g/bhp-hr (lean-burn engine with SCR, rich-burn engine with 3-way catalyst, or other equivalent) (Achieved in Practice)

d. Step 4 - Cost Effectiveness Analysis

Option 1: NO_x emissions ≤ 0.15 g/bhp-hr (lean-burn engine with SCR, rich-burn engine with 3-way catalyst, or other equivalent) (Achieved in Practice)

This option is achieved practice and has been proposed by the applicant; therefore a cost analysis is not required.

e. Step 5 - Select BACT

Pursuant to the above BACT Analysis, BACT for the Digester Gas-fired Engine must be satisfied with the following: NO_x: NO_x emissions to ≤ 0.15 g/bhp-hr

The applicant has proposed to use an SCR system for the digester gas-fired lean burn IC engine to reduce NO_x emissions to ≤ 0.15 g/bhp-hr. Therefore, the BACT requirements are satisfied.

2. BACT Analysis for SO_x Emissions:

a. Step 1 - Identify all control technologies

The following options were identified to reduce SO_x emissions from the engine:

- 1) Sulfur Content of fuel gas not exceeding 40 ppmv H₂S (or equivalent) (Achieved in Practice/Contained in SIP)

There are no options listed in the SJVUAPCD BACT Clearinghouse as alternate basic equipment.

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

The control efficiency of each of the options above is estimated and the controls are ranked below based on the control effectiveness.

- 1) Sulfur Content of fuel gas not exceeding 40 ppmv H₂S (or equivalent) (Achieved in Practice)

d. Step 4 - Cost Effectiveness Analysis

The applicant has proposed to satisfy the BACT requirement for SO_x from the engine by meeting an emission limit for SO_x in the exhaust of 2.1 ppmvd @ 15% O₂ (0.04 g-SO_x/bhp-hr), which as shown below is equivalent to the fuel sulfur content limit of 40 ppmv as H₂S; therefore a cost analysis is not required.

SO_x – 40 ppmvd H₂S in fuel gas

$$\frac{40 \text{ ft}^3 \text{ H}_2\text{S}}{10^6 \text{ ft}^3} \times \frac{32.06 \text{ lb S}}{\text{lb - mol H}_2\text{S}} \times \frac{\text{lb - mole}}{379.5 \text{ ft}^3} \times \frac{64.06 \text{ lb SO}_2}{32.06 \text{ lb S}} \times \frac{\text{ft}^3}{600 \text{ Btu}} \times \frac{10^6 \text{ Btu}}{\text{MMBtu}} = 0.0113 \frac{\text{lb SO}_x}{\text{MMBtu}}$$

$$0.0113 \frac{\text{lb SO}_x}{\text{MMBtu}} \times \frac{1 \text{ MMBtu}}{10^6 \text{ Btu}} \times \frac{\text{Btu}_{in}}{0.33 \text{ Btu}_{out}} \times \frac{2,545 \text{ Btu}}{\text{hp - hr}} \times \frac{453.59 \text{ g}}{\text{lb}} = 0.040 \frac{\text{g SO}_x}{\text{bhp - hr}}$$

$$\frac{\text{SO}_x - 0.04 \text{ g/bhp-hr}}{0.04 \frac{\text{g SO}_x}{\text{bhp-hr}} \times \frac{1 \text{ lb}}{453.59 \text{ g}} \times \frac{1 \text{ hp-hr}}{2,545 \text{ Btu}} \times \frac{0.33 \text{ Btu}_{\text{out}}}{1 \text{ Btu}_{\text{in}}} \times \frac{10^6 \text{ Btu}}{1 \text{ MMBtu}} = 0.0114 \frac{\text{lb SO}_x}{\text{MMBtu}}$$

$$0.0114 \frac{\text{lb SO}_x}{\text{MMBtu}} \times \frac{(20.9-15)\% \text{ O}_2}{20.9\% \text{ O}_2} \times \frac{1 \text{ MMBtu}}{9,100 \text{ ft}^3} \times \frac{379.5 \text{ ft}^3}{\text{lb-mole}} \times \frac{\text{lb-mole}}{64.06 \text{ lb NO}_x} \times \frac{10^6 \text{ ppmv}}{1} = 2.1 \text{ ppmvd SO}_x @ 15\% \text{ O}_2$$

e. Step 5 - Select BACT

Pursuant to the above BACT Analysis, BACT for SO_x emissions from the engine is SO_x emissions in the exhaust not exceeding 2.1 ppmvd SO_x @ 15% O₂ (equivalent to a fuel sulfur limit of 40 ppmv as H₂S). The applicant has proposed to meet this limit using a biological sulfur removal system in the digester tanks to remove sulfur from the digester gas fuel and by using the ammonia from the SCR system to remove SO_x from the exhaust. Therefore, the BACT requirements for SO_x are satisfied.

3. BACT Analysis for VOC Emissions:

a. Step 1 - Identify all control technologies

The following options were identified to reduce VOC emissions:

- 1) VOC emissions ≤ 0.10 g/bhp-hr (lean burn or equivalent and positive crankcase ventilation) (Achieved in Practice)
- 2) Fuel Cells (≤ 0.02 lb/MW-hr) (Alternate Basic Equipment)

b. Step 2 - Eliminate options

The Alternate Basic Equipment BACT Options for VOC: Fuel Cells will be removed for consideration for this project.

ATC Permit N-6311-9-0 was originally issued for the engine being evaluated under this project on September 21, 2007 under Project N-1072585 and the engine was installed at the facility in 2008. Revised ATC Permit N-6311-9-1 was reissued under Project N-1083706 to incorporate a flexible BACT emission limit for NO_x. The previous ATC permits for the engine (N-6311-9-0 & -9-1) could not be fully implemented (primarily because of exceeding the required digester fuel sulfur limit); therefore, the engine will be treated as a new unit installed without a valid ATC for purposes of this BACT analysis.

District FYI 98 (Revised November 15, 2004) – “BACT for Equipment Installed without an ATC” contains the following directions for evaluating equipment installed without an ATC: 1) If the equipment was installed without BACT (i.e., BACT at the time of installation), the District must perform a complete current BACT analysis, exactly as if it were a new proposal; 2) If the equipment was installed with BACT (i.e., BACT at the time of installation), or if BACT did not exist at the time of installation, the current BACT

analysis is limited to the types of controls that can be applied to the SPECIFIC equipment that was already installed.

Previous BACT Guideline 3.3.13 - Waste Gas Fired IC Engine > 50 hp (rescinded 8/22/2008) required digester gas-fired IC engines to satisfy Achieved in Practice BACT for VOC with one of the following emission limits: 130 ppmvd @ 15% O₂, 0.6 g/bhp-hr, or 1.9 lb/MW-hr. BACT Guideline 3.3.13 contained a Technologically Feasible BACT limit for VOC of 0.25 g/bhp-hr and did not contain any Alternative Basic Equipment BACT options for VOC. Original ATC Permit N-6311-9-0 for the engine required a VOC emission limit of 20 ppmv @ 15% O₂, which was determined to be Achieved in Practice BACT for dairy digester gas-fired IC engines under Project N-1072585. The BACT evaluation performed for Project N-1072585 did not contain any Technologically Feasible BACT options for VOC and, for Alternative Basic Equipment, indicated that biogas injection into the natural gas pipeline network "shall be considered only if onsite power generation is not primary purpose." The evaluation for Project N-1072585 indicated that the 20 ppmv VOC @ 15% O₂ emission limit was equivalent to 0.11 g-VOC/bhp-hr. After issuance of the original ATC permit and installation of the engine, revised ATC Permit N-6311-9-1 was then issued for the engine allowing a flexible NO_x BACT emission limit. ATC N-6311-9-1 required a VOC emission limit of 0.13 g-VOC/bhp-hr (= 28 ppmvd VOC @ 15% O₂).

The engine being evaluated was installed in 2008 and source testing has demonstrated compliance with the 20 ppmv @ 15% O₂ VOC emission limit. Therefore, it has been determined that the engine satisfies the BACT for VOC that was required the time the engine was installed. In accordance with District FYI 98, only controls that can be applied to the specific engine will be considered in this BACT analysis and the Alternate Basic Equipment BACT options for VOC (i.e. Fuel Cells) will be removed for consideration for this project.

c. Step 3 - Rank remaining options by control effectiveness

1) VOC emissions ≤ 0.10 g/bhp-hr (Achieved in Practice)

d. Step 4 - Cost Effectiveness Analysis

Option 1: VOC emissions ≤ 0.10 g/bhp-hr (Achieved in Practice)

This has been identified as achieved in practice and has been proposed by the applicant. Therefore, the option required and is not subject to a cost analysis.

e. Step 5 - Select BACT

Pursuant to the above BACT Analysis, BACT for VOC emissions from the engine is VOC emissions ≤ 0.10 g/bhp-hr. The applicant has VOC emissions ≤ 0.10 g/bhp-hr. Therefore, the BACT requirements for VOC are satisfied.

4. BACT Analysis for NH₃ Slip Emissions:

A Selective Catalytic Reduction (SCR) system operates as an external control device where flue gases and a reagent (e.g. urea or ammonia) are passed through an appropriate catalyst. The reagent is used to reduce NO_x, over the catalyst bed, to form elemental nitrogen, water vapor, and other by-products. The use of a catalyst typically reduces the NO_x emissions by up to 90%. Ammonia slip is the result of unreacted ammonia exiting the SCR system.

a. Step 1 - Identify all control technologies

The District has not established a cost effectiveness threshold for ammonia. Therefore, only options that are determined to be Achieved-in-Practice controls will be considered for ammonia in this analysis.

District BACT Guideline 3.3.15 lists an ammonia slip emission limit of 10 ppmvd @ 15% O₂ as an Achieved in Practice BACT requirement for waste gas-fired IC engines.

- 1) NH₃ emissions ≤ 10 ppmvd @ 15% O₂ (Achieved in Practice)

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) NH₃ emissions ≤ 10 ppmvd @ 15% O₂ (Achieved in Practice)

d. Step 4 - Cost Effectiveness Analysis

The only option above is achieved in practice and has been proposed by the applicant. Additionally, as stated above, a cost effectiveness threshold for ammonia has not been established by the District. Therefore a cost analysis is not required.

e. Step 5 - Select BACT

Pursuant to the above BACT Analysis, BACT for NH₃ slip emissions from the engine is NH₃ slip emissions ≤ 10 ppmvd @ 15% O₂. The applicant has NH₃ slip emissions ≤ 10 ppmvd @ 15% O₂. Therefore, the BACT requirements for NH₃ slip are satisfied.

APPENDIX F

Summary of Health Risk Assessment (HRA) and Ambient Air Quality Analysis (AAQA)

San Joaquin Valley Air Pollution Control District Risk Management Review

To: Ramon Norman – Permit Services
 From: Cheryl Lawler – Technical Services
 Date: January 12, 2016
 Facility Name: Fiscalini Farms & Dairy
 Location: 4848 Jackson Road, Modesto
 Application #(s): N-6311-9-2 & 10-2
 Project #: N-1153078

A. RMR SUMMARY

RMR Summary				
Categories	Digester Gas ICE (Unit 9-2)	Biogas Flare (Unit 10-2)	Project Totals	Facility Totals
Prioritization Score	2.13	0.07	>1.0	>1.0
Acute Hazard Index	0.00	0.00	0.00	0.00
Chronic Hazard Index	0.00	0.00	0.00	0.00
Maximum Individual Cancer Risk	1.82E-08	1.14E-10	1.83E-08	1.83E-08
T-BACT Required?	No	No		
Special Permit Conditions?	No	No		

B. RMR REPORT

I. Project Description

Technical Services received a request on December 28, 2015, to perform an Ambient Air Quality Analysis and a Risk Management Review for a digester gas internal combustion engine (Unit 9-2) and a biogas backup flare (Unit 10-2).

II. Analysis

Toxic emissions for the engine were calculated using Digester Gas fired internal combustion engine emission factors derived from the 2002 Reciprocating Internal Combustion Engine (RICE) EPA database, and toxic emissions for the flare were calculated using 2001 Ventura County Air Pollution Control District 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 then input into the San Joaquin Valley APCD's Hazard Assessment and Reporting Program (SHARP). In accordance with the District's Risk Management Policy for Permitting New and Modified Sources (APR 1905, March 2, 2001), risks from the project were prioritized using

the procedures in the 1990 CAPCOA Facility Prioritization Guidelines. The prioritization score for the project 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 2009-2013 from Modesto 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:

Analysis Parameters			
Unit 9-2 (ICE)		Unit 10-2 (Flare)	
Source Type	Point	Source Type	Flare
Stack Height (m)	6.1	Release Height (m)	6.1
Stack Diameter (m)	0.3	Stack Inside Diameter (m)	0.4
Gas Exit Velocity (m/s)	29.17 ¹	Gas Exit Velocity (m/s)	12.9
Gas Exit Temp. (°K)	628	Gas Exit Temp. (°K)	1089
Location Type	Rural	ICE Digester Gas Process Rates (MMscf)	0.0119 hr 103.98 yr
Closest Receptor (m)	268	Flare Biogas Process Rates (MMscf)	0.009 hr 30 yr
Type of Receptor	Residence		

¹Per the Supplemental Application Form submitted by the applicant, the exhaust stack vents horizontally. Therefore, the source group was designated as such in AERMOD's Source Pathway Module during refined modeling for the project per District policy.

Technical Services also performed modeling for criteria pollutants CO, NO_x, SO_x and PM₁₀; as well as a RMR. The emission rates used for criteria pollutant modeling were supplied by the processing engineer.

The results from the Criteria Pollutant Modeling are as follows:

Criteria Pollutant Modeling Results*

ICE & Flare	1 Hour	3 Hours	8 Hours	24 Hours	Annual
CO	Pass	X	Pass	X	X
NO _x	Pass ¹	X	X	X	Pass
SO _x	Pass	Pass	X	Pass	Pass
PM ₁₀	X	X	X	Pass ²	Pass ²

*Results were taken from the attached PSD spreadsheet.

¹The project was compared to the 1-hour NO₂ National Ambient Air Quality Standard that became effective on April 12, 2010, using the District's approved procedures.

²The criteria pollutants are below EPA's Level of Significance as found in 40 CFR Part 51.165 (b)(2).

III. Conclusions

The Acute and Chronic Indices are below 1.0, and the Cancer Risk factor associated with the project is less than 1.0 in a million. **In accordance with the District's Risk Management Policy, the project is approved without Toxic Best Available Control Technology (T-BACT).**

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

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.

Attachments

RMR Request Form & Attachments
Emission Speciation Worksheets
Prioritization
Facility Summary
AAQA Results

APPENDIX G
Draft ATCs
(N-6311-9-2 & -10-2)

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

ISSUANCE DATE: DRAFT
DRAFT

PERMIT NO: N-6311-9-2

LEGAL OWNER OR OPERATOR: FISCALINI FARMS & FISCALINI DAIRY

MAILING ADDRESS: 7231 COVERT RD
MODESTO, CA 95358

LOCATION: 4848 JACKSON RD
MODESTO, CA 95358

EQUIPMENT DESCRIPTION:

1,057 BHP GUASCOR MODEL SFGLD-560 DIGESTER GAS-FIRED LEAN-BURN IC ENGINE WITH AN EF&EE SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM POWERING A 710 KW ELECTRICAL GENERATOR

CONDITIONS

1. This Authority to Construct (ATC) supersedes and replaces ATC N-6311-9-0 and ATC N-6311-9-1. [District Rule 2201]
2. {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]
3. {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]
4. {3658} This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [Public Resources Code 21000-21177: California Environmental Quality Act]
5. 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]
6. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
7. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]

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YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (209) 557-6400 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.

Seyed Sadredin, Executive Director / APCO

Arnaud Marjolle, Director of Permit Services

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8. {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]
9. {4261} This engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer or emissions control system supplier. [District Rule 4702]
10. {3203} This engine shall be operated within the ranges that the source testing has shown result in pollution concentrations within the emissions limits as specified on this permit. [District Rule 4702]
11. This engine shall be fired only on digester gas as fuel. [District Rule 2201]
12. This engine shall be equipped with an operational non-resettable elapsed time meter. [District Rules 2201 and 4702]
13. 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]
14. Emissions from this IC engine shall not exceed any of the following limits: 0.15 g-NO_x/bhp-hr (for periodic alternate monitoring, equivalent to 11 ppmvd NO_x @ 15% O₂), NO_x referenced as NO₂; 2.2 g-CO/bhp-hr (for periodic alternate monitoring, equivalent to 265 ppmvd CO @ 15% O₂); 0.10 g-VOC/bhp-hr (for periodic alternate monitoring, equivalent to 21 ppmvd VOC @ 15% O₂), VOC referenced as methane. [District Rules 2201 and 4702]
15. SO_x emissions from this IC engine shall not exceed 2.1 ppmvd @ 15% O₂, or shall not exceed 2.0 lb/day. SO_x concentrations in the exhaust will be determined as the sum of the measured SO₂ and SO₃ concentrations. [District Rules 2201 and 4801]
16. PM₁₀ emissions from this IC engine shall not exceed 2.0 lb/day. [District Rule 2201]
17. Ammonia (NH₃) emissions from this engine shall not exceed 10 ppmvd @ 15% O₂. [District Rules 2201 and 4102]
18. Source testing to measure NO_x, CO, VOC, SO_x, PM₁₀, and ammonia (NH₃) emissions from this unit shall be conducted at least once every 24 months. [District Rules 1081, 2201, and 4702]
19. {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]
20. For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. 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 methane. NO_x, CO, VOC, SO_x, and NH₃ concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rules 2201 and 4702]
21. The following methods shall be used for source testing: NO_x (ppmv) - EPA Method 7E or ARB Method 100; CO (ppmv) - EPA Method 10 or ARB Method 100; VOC (ppmv) - EPA Method 18, 25A or 25B, or ARB Method 100; stack gas oxygen - EPA Method 3 or 3A or ARB Method 100; 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, or ARB Method 5 in combination with Method 501; NH₃ - BAAQMD ST-1B or SCAQMD Method 207-1. Alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702]
22. In lieu of performing a source test for PM₁₀, the results of a total particulate test may be used for compliance with the PM₁₀ limit provided the results include both the filterable and condensable (back half) particulate, and that all particulate matter is assumed to be PM₁₀. [District Rules 1081 and 2201]
23. The following methods shall be used for source testing of SO_x emissions: SO₂ (ppmv) - EPA Method 6, EPA Method 6C, EPA Method 8, or ARB Method 100; SO₃ - EPA Method 8, EPA Method 8A, EPA Conditional Test Method (CTM) 13A, or National Council for Air and Stream Improvement, Inc. (NCASI) Method 8A. SO_x concentrations in the exhaust will be determined as the sum of the measured SO₂ and SO₃ concentrations. [District Rules 1081 and 2201]
24. Fuel sulfur content analysis shall be performed at least once every 24 months using EPA Method 11 or EPA Method 15, as appropriate. Fuel samples shall be taken and analyzed for fuel sulfur content whenever SO_x emissions from this unit are source tested. Records of the fuel sulfur analysis shall be maintained and provided to the District upon request. [District Rule 2201]

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25. The Higher Heating Value (HHV) of the fuel gas shall be determined using ASTM D1826, ASTM 1945 in conjunction with ASTM D3588, or an alternative method approved by the District. [District Rules 2201 and 4702]
26. Source testing shall be witnessed or authorized by the District, and samples shall be collected by a California Air Resources Board certified testing laboratory. [District Rule 1081]
27. {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]
28. The results of each source test shall be submitted to the District within 60 days after completion of the source test. [District Rule 1081]
29. The sulfur content of the digester gas used to fuel the engine shall be monitored and recorded at least once every calendar quarter in which a fuel sulfur analysis is not performed. Monitoring of the sulfur content of the digester gas fuel shall not be required if the engine does not operate during that period. Records of the results of monitoring of the digester gas fuel sulfur content shall be maintained. [District Rule 2201]
30. 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]
31. 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]
32. The permittee shall monitor and record the stack concentration of NO_x, CO, O₂, and SO₂ at least once every calendar quarter (in which a source test is not performed) using a portable emission monitor that meets District specifications (or other District-approved method for SO₂/SO_x). [In-stack monitors may be allowed if they satisfy the standards for portable analyzers as specified in District policies and are approved in writing by the APCO.] Monitoring shall be performed not less than once every month for 12 months if two 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 Rules 2201 and 4702]
33. 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. [District Rules 2201 and 4102]

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34. If the NO_x, CO, SO₂, or NH₃ concentrations corrected to 15% O₂, as measured by the portable analyzer or the District-approved ammonia monitoring equipment, exceed the respective allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours of operation after detection. If the portable analyzer or ammonia monitoring equipment readings continue to exceed the allowable emissions concentration after 8 hours of operation after detection, 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 the performing the notification and testing required by this condition. SO₂ concentrations measured at times that SO₂/SO_x emissions are demonstrated not to exceed 2.0 lb/day based on the engine operating load or exhaust flow rate are not subject to the requirements in this condition to conduct a source test or stipulate that an emissions violation has occurred. [District Rules 2201 and 4702]
35. {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]
36. The permittee shall maintain records of: (1) the date and time of NO_x, CO, O₂, SO₂, and NH₃ measurements, (2) the O₂ concentration in percent and the measured NO_x, CO, SO₂, and NH₃ concentrations corrected to 15% O₂, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, (5) the method of determining the NH₃ emission concentration, and (6) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 2201 and 4702]
37. The SCR system reagent injection rate and inlet temperature to the catalyst control system shall be monitored to establish acceptable values and ranges that provide a reasonable assurance of ongoing compliance with the NO_x emissions limit(s) stated in this permit. Acceptable values and ranges shall be established for each load that the engine is expected to operate at, in a minimum of 10% increments (e.g. 70%, 80%, and 90%). Records of the acceptable SCR system reagent injection rate(s) and inlet temperature(s) to the catalyst control system demonstrated to result in compliance with the NO_x emission limit(s) shall be maintained and made available for inspection upon request. [District Rule 4702]
38. If the SCR system reagent injection rate and/or the inlet temperature to the catalyst control system is outside of the established acceptable range(s), the permittee shall return the SCR system reagent injection rate and inlet temperature to the catalyst control system to within the established acceptable range(s) as soon as possible, but no longer than 8 hours after detection. If the SCR system reagent injection rate and inlet temperature to the catalyst control system are not returned to within acceptable range(s) within 8 hours, the permittee shall notify the District within the following 1 hour and begin monitoring and recording the stack concentration of NO_x and O₂ at least once every month. Monthly monitoring of the stack concentration of NO_x and O₂ shall continue until the operator can show that the SCR system reagent injection rate and inlet temperature to the catalyst control system are operating within the acceptable range(s) demonstrated to result in compliance with the NO_x emission limit(s) of this permit. [District Rule 4702]
39. The permittee shall monitor and record the engine operating load, the SCR system reagent injection rate, and the inlet exhaust temperature to the catalyst control system at least once per month. [District Rule 4702]
40. 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 or standard cubic meters using a non-resettable, totalizing mass or volumetric fuel flow meter or other APCO approved-device. [District Rules 2201 and 4702]

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41. {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]
42. 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: N-6311-10-2

LEGAL OWNER OR OPERATOR: FISCALINI FARMS & FISCALINI DAIRY

MAILING ADDRESS: 7231 COVERT RD
MODESTO, CA 95358

LOCATION: 4848 JACKSON RD
MODESTO, CA 95358

EQUIPMENT DESCRIPTION:

8,829 FT³/HR (250 M³/HR, 5.3 MMBTU/HR) MUCHE KLÄRANLAGENBAU MODEL FBA 250 SEMI-ENCLOSED BIOGAS FLARE CONTROLLING GAS FROM ANAEROBIC DIGESTER TANKS

CONDITIONS

1. This Authority to Construct (ATC) supersedes and replaces ATC N-6311-10-0 and ATC N-6311-10-1. [District Rule 2201]
2. {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]
3. {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]
4. {3658} This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [Public Resources Code 21000-21177: California Environmental Quality Act]
5. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
6. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
7. 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 1/2 or 10% opacity. [District Rules 2201 and 4101]

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Seyed Sadredin, Executive Director / APCO

Arnaud Marjollet, Director of Permit Services

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8. Only digester gas shall be combusted in the flare. [District Rule 2201]
9. The amount of digester gas combusted in the flare shall not exceed the following limits: 0.2119 MMscf (or 127.14 MMBtu) in any one day and 19.336 MMscf (or 11,601.6 MMBtu) in any consecutive 365-day period. [District Rule 2201]
10. The flare shall be equipped with an operational, non-resettable, totalizing mass or volumetric fuel flow meter or other District-approved alternative method to measure the amount of gas combusted in the flare. [District Rule 2201]
11. Emissions from the flare shall not exceed any of the following limits: 0.047 lb-NO_x/MMBtu, 0.015 lb-PM₁₀/MMBtu, 0.003 lb-CO/MMBtu, and 0.003 lb-VOC/MMBtu. [District Rule 2201]
12. The sulfur content of the digester gas flared shall not exceed 500 ppmv as H₂S. [District Rules 2201 and 4801]
13. Digester gas sulfur content analysis shall be performed at least once every 12 months 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]
14. The sulfur content of the digester gas combusted in this flare 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 of the sulfur content of the digester gas flared shall not be required if the flare does not operate during that period. Records of the results of monitoring of the digester gas sulfur content shall be maintained. [District Rule 2201]
15. 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]
16. A flame shall be present at all times whenever combustible gases are vented through the flare. [District Rules 2201 and 4301]
17. 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 Rules 2201 and 4311]
18. Unless the flare is equipped with a flow-sensing ignition system, the flare shall be equipped and operated with a heat sensing device such as a thermocouple, ultraviolet beam sensor, infrared sensor, or an equivalent device, capable of continuously detecting at least one pilot flame. [District Rule 4311]
19. Flares that use flow-sensing automatic ignition systems and which do not use a continuous flame pilot shall use purge gas for purging. [District Rule 4311]
20. Open flares (air-assisted, steam-assisted, or non-assisted) in which the flare gas pressure is less than 5 psig shall be operated in such a manner that meets the provisions of 40 CFR 60.18. [District Rules 2201 and 4311]
21. Upon request, the operator of an open flare in which the flare gas pressure is less than 5 psig shall make available records that demonstrate compliance with the provisions of 40 CFR 60.18, (c)(3) through (c)(5). [District Rules 2201 and 4311]
22. The operator shall notify the APCO of an unplanned flaring event within 24 hours after the start of the next business day or within 24 hours of their discovery, whichever occurs first. The notification shall include the flare source identification, the start date and time, and the end date and time. [District Rule 4311]
23. Flaring is prohibited unless it is consistent with the approved flare minimization plan (FMP) and all commitments listed in that plan have been met. This standard does not apply if the APCO determines that the flaring is caused by an emergency as defined by Section 3.7 and is necessary to prevent an accident, hazard or release of vent gas directly to the atmosphere. [District Rule 4311]

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24. Every five years after submittal of the initial flare minimization plan (FMP), the operator shall submit an updated FMP for each flare to the APCO for approval. The current FMP shall remain in effect until the updated FMP is approved by the APCO. If the operator fails to submit an updated FMP as required by this section, the existing FMP shall no longer be considered an approved plan. [District Rule 4311]
25. An updated flare minimization plan (FMP) shall be submitted pursuant to Section 6.5 of Rule 4311 addressing new or modified equipment, prior to installing the equipment. Updated FMP submittals are only required if: (1) The equipment change would require an Authority to Construct (ATC) and would impact the emissions from the flare, and (2) The modification is not solely the removal or decommissioning of equipment that is listed in the FMP, and has no associated increase in flare emissions. [District Rule 4311]
26. Permittee shall maintain daily and annual records of the quantity of digester gas combusted in the flare in standard cubic feet (scf) or standard cubic meters and shall maintain a copy of the approved flare minimization plan (FMP). [District Rules 1070, 2201, and 4311]
27. 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 1070, 2201, and 4311]

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