

**STATEMENT OF BASIS
FOR
ISSUANCE OF TITLE V FEDERAL OPERATING PERMIT**

Title V Permit No.:	<u>13004</u>
Date:	<u>Draft June 10, 2013</u>
Reviewing Engineer:	<u>Timothy Mitro</u>

FACILITY INFORMATION:

FACILITY NAME: Calpine Greenleaf II & Yuba City Energy Center

LOCATION: 875 North Walton Ave
Yuba City, CA 95993

MAILING ADDRESS: Calpine Greenleaf, Inc &
Gilroy Energy Center
5029 South Township Rd
Yuba City, CA 95993

RESPONSIBLE OFFICIAL: Larry Sessions
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PURPOSE OF THIS STATEMENT OF BASIS

The Title V Federal Operating Permit is intended to be a document containing only enforceable terms and conditions as well as any additional information, such as the identification of emission units, emission points, emission sources and processes that makes the terms meaningful. 40 CFR Part 70.7(a)(5) requires that each Title V permit have an accompanying "...statement that sets forth the legal and factual basis for the draft permit conditions". The purpose of this Statement of Basis is to satisfy the above requirement by providing pertinent details regarding the permit and application data and permit conditions in a more easily understandable format. This report will also include background narrative and explanations of regulatory decisions made by the reviewer. It should be emphasized that this Statement of Basis, while based on information contained in the permit, is a separate document and is not itself an enforceable term and condition of the permit.

PERMIT ACTION:

This Statement of Basis is for the initial Title V Federal Operating Permit No. 13004 for Calpine Greenleaf II and Yuba City Energy Center. The purpose of this evaluation is to identify all applicable requirements, determine if the facility will comply with those applicable requirements, and to provide the legal and factual basis for the permit conditions. The facility is currently operating under an application shield as specified in FRAQMD Rule 10.3.D.1 because they submitted the application for an initial Title V permit during the 12-month period following the source commencing operation (FRAQMD Rule 10.3.D.2.a.3). The application shield will be removed when the Title V permit is issued.

FACILITY DESCRIPTION:

The facility is comprised of two plants: Calpine Greenleaf II and Yuba City Energy Center.

Calpine Greenleaf II

Calpine Greenleaf II consists of a 49.5-MW nominal simple cycle combustion gas turbine and a duct-fired heat recovery steam generator (HRSG). This plant also acts as a cogeneration unit as it supplies steam to Sunsweet Growers for use in their manufacturing processes. The major mechanical components of the plant include one gas-fired turbine generator set and a duct-fired HRSG. Other major equipment includes absorption/chiller units, cooling towers, switchgears, and transformers. In addition, the facility has water and wastewater treatment facilities.

Compressors supply combustion air to the turbine, drawing the air through inlet plenums and filter houses to remove particulate matter and then through chillers to lower the temperature of the combustion air to an optimum level. Natural gas is injected into the turbine where it is blended with combustion air and burned. The expansion of the hot combustion gases drives a gas turbine-generator that produces electricity. The turbine set includes lube oil systems, inlet air filtration, starting systems, fire protection, and microprocessor-based control panels.

The Calpine Greenleaf II gas turbine-generator set is a General Electric LM5000 gas turbine with a Brush generator. The combustion section of the gas turbine includes steam injection for nitrogen oxides emission control. Additional steam injection into the high-pressure compressor outlet section, and into the low-pressure turbine section, provides power enhancement for the gas turbine. The gas turbine exhaust flows through ductwork to the HRSG.

The Calpine Greenleaf II HRSG extracts waste heat from the turbine exhaust and produces high-pressure superheated steam, intermediate-pressure superheated steam, and saturated steam. The superheated steam is injected in the combustion gas turbine for NO_x control and for power augmentation. The saturated steam is used to operate chillers and is provided to Sunsweet Growers. The HRSG is equipped with a natural gas-fired duct burner for auxiliary steam generation. The duct burner raises the inlet temperature of the gas turbine exhaust gas to increase the HRSG's steam output.

A selective catalytic reduction (SCR) reactor controls NO_x emissions from the turbine and duct burner. The gas turbine and duct burner exhaust is discharged through a stack into the atmosphere.

Yuba City Energy Center (YCEC)

YCEC consists of a 48.1-MW nominal simple cycle combustion gas turbine. The plant produces electricity for commercial sale to meet peak power demands.

Compressors supply combustion air to the turbine, drawing the air through inlet plenums and filter houses to remove particulate matter and then through chillers to lower the temperature of the combustion air to an optimum level. Natural gas is injected into the turbine where it is blended with combustion air and burned. The expansion of the hot combustion gases drives a gas turbine-generator that produces electricity. The turbine set includes lube oil systems, inlet air filtration, starting systems, fire protection, and microprocessor-based control panels.

The YCEC gas turbine-generator set is a General Electric LM6000 gas turbine with a Brush generator. The combustion section of the gas turbine includes water injection for nitrogen oxides emission control. The gas turbine exhaust flows through ductwork to the SCR system and then the oxidation catalyst.

A selective catalytic reduction (SCR) reactor controls NO_x emissions from the turbine. An oxidation catalyst controls CO and VOC emissions from the turbine. The gas turbine exhaust is discharged through a stack into the atmosphere.

SIGNIFICANT EMISSIONS UNIT DESCRIPTION:

Calpine Greenleaf II

Gas Turbine (S-1)

Manufacturer:	General Electric
Model No.:	7LM5000-GE-NGA
Type:	Simple Cycle, Cogeneration
Emission Control:	Steam injection, Low Sulfur Fuel, Combustion Controls, Selective Catalytic Reduction (SCR)
Fuel:	Natural gas
Max. Heat Input:	450 MMBTU/hour
Net Output:	Nominal 49.5 MW

Duct Burner for the Heat Recovery Steam Generator (S-2)

Manufacturer:	Coen
Emission Control:	Low-NO _x combustion design
Fuel:	Natural gas
Max. Rating:	84,000 scf/hour

Air Pollution Control System for S-1 and S-2 for NO_x

Manufacturer:	Johnson Matthey
Emission Control:	SCR – anhydrous ammonia
Venting	Gas Turbine and Duct Burner

IC Engine (S-3)

Manufacturer:	Waukesha
Model No.:	L7042G
Type:	4 stroke, rich burn
Emission Control:	Nonselective Catalytic Reduction (NSCR)

Fuel: Natural gas
Max Rating: 810 hp @ 1000 rpm
Work Performed: Emergency Compressor

Air Pollution Control System for S-3 for NOx, VOC, and CO

Control Device: 3-way catalyst using NSCR
Manufacturer: DCL
Model: 2-DXC74x
Venting: IC engine

Yuba City Energy Center

Gas Turbine (S-4)

Manufacturer: General Electric
Model No.: LM6000PC
Type: Simple Cycle
Emission Control: SCR and Oxidation catalyst
Fuel: Natural gas
Max. Heat Input: 500 MMBTU/hour
Net Output: 48.1 MW (nominal)

Air Pollution Control System for S-4 for NOx

Control Device: SCR – aqueous ammonia
Venting: Gas Turbine

Air Pollution Control System for S-4 for CO and VOC

Control Device: Oxidation Catalyst
Venting: Gas Turbine

INSIGNIFICANT EMISSIONS UNIT DESCRIPTION:

An insignificant activity is any activity, process or emissions unit which is not subject to a source-specific requirement of a State Implementation Plan, preconstruction permit or federal standard and which:

- 1) meets the FRAQMD's "Criteria for Specific Source Categories," or
- 2) emits no more than 0.5 tons per year of a federal hazardous air pollutant (HAP) and no more than two tons per year of a regulated pollutant that is not a HAP.

EXEMPT EQUIPMENT	EQUIPMENT DESCRIPTION	BASIS FOR EXEMPTION
Utility carts, man-lift, fork lift, on-road vehicles	Mobile Equipment (nonroad vehicles)	Rule 4.3.a and 4.3.g
Chiller (cooling tower)	Air intake chiller < 10,000 gpm	Rule 4.3.d Rule 10.3 Attachment 1 - B.3
Air conditioning and office heating	HVAC equipment < 60,000,000 BTU/hr	Rule 4.3.d and 4.3.e Rule 10.3 Attachment 1 - B.2.d
Parts cleaner	Solvent cleaning tank	Rule 4.3.h Rule 10.3 Attachment 1 - B.15
Turbine lube oil tanks	Turbine lube oil tanks (vapor pressure < 1.5 psig)	Rule 4.3.h Rule 10.3 Attachment 1 - B.7.d
Brazing, welding, soldering associated with maintenance.	Maintenance equipment	Rule 4.3.h Rule 10.3 Attachment 1 – B.17
Ammonia Tank 12,000 gallon (regulated only for RMP CAA §112r) 19.5% aqueous	Any valves, flanges, and unvented (except for emergency pressure relief valves) pressure vessels	Rule 4.3.h Rule 10.3 Attachment 1 – B.1
Natural gas supply lines, valves, flanges, compressors.	Any valves, flanges, and unvented (except for emergency pressure relief valves) pressure vessels	Rule 4.3.h Rule 10.3 Attachment 1 – B.11
Various oil tanks, vessels, pipelines	Turbine lube and transformer oil	Rule 4.3.h Rule 10.3 Attachment 1 – B.8

ALTERNATE OPERATING SCENARIOS:

None requested by permittee.

FACILITY EMISSIONS:

Facility	Equipment	Maximum Allowable Annual Emissions (tons per year)				
		VOC	NOx	SOx	PM10	CO
Calpine Greenleaf II	S-1 – Gas Turbine S-2 – Duct Burner	28.47	44.71	0.96	14.89	98
	S-3 – IC Engine	1.17	1.17	0.02	0.26	4.69
Yuba City Energy Center	S-4 – Gas Turbine	3.22	14.0	0.87	7.25	16.9
Facility Total		32.86	59.89	1.85	22.4	119.57

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS Facility-wide Requirements

FACILITY-WIDE REQUIREMENTS:

FRAQMD Rule 1.1 - Definitions

SIP approved: 04-12-1982 (47 FR 15585)
Rule Description: This rule provides definitions of terms used in permitting and prohibitory requirements.
Compliance Status: The rule does not require the permittee to take any actions.

FRAQMD Rule 3.0 - Visible Emissions

SIP approved: 04-12-1982 (47 FR 15585)
Rule Description: This rule limits the discharge of air contaminants into the atmosphere through visible emissions and a 40% opacity limitation.
Compliance Status: All equipment is expected to comply with the visible emission requirement. The permit will contain the necessary conditions to remain in compliance with this rule.

FRAQMD Rule 3.2 – Particulate Concentration

SIP approved: 04-12-1982 (47 FR 15585)
Rule Description: This rule regulates emissions of particulate matter (PM) from non-combustion and combustion processes. PM from combustion sources shall not exceed 0.3 grains/dscf corrected to 12% CO2.
Compliance Status: All equipment is expected to comply with the particulate concentration requirement. The permit will contain the necessary conditions to remain in compliance with this rule.

FRAQMD Rule 3.3 - Dust and Fumes

The following rule is not an applicable federal requirement but is discussed here to document the non-applicability determination:

SIP approved: 04-12-1982 (47 FR 15585)
Rule Description: This rule regulates emissions of particulate matter (PM) from sources that "process" materials that emit particulate matter. The allowable particulate matter emission is based on the weight of the material "processed".
Compliance Status: The FRAQMD has determined that the rule is not applicable to the facility because the equipment does not "process" material.

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS Facility-wide Requirements

FRAQMD Rule 3.11 – Posting of Permit

SIP approved: 09-22-1972 (37 FR 19812)
Rule Description: This rule requires that a permit be posted or be readily available at all times on the operating premises.
Compliance Status: The facility is expected to comply with the requirement. The permit will contain the necessary conditions to remain in compliance with this rule.

FRAQMD Rule 3.13 – Circumvention

SIP approved: 04-12-1982 (47 FR 15585)
Rule Description: This rule requires the permittee to not conceal any emissions which would constitute a violation of the State of California Health and Safety Code or the FRAQMD Rules and Regulations.
Compliance Status: The facility is expected to comply with the requirement. The permit will contain the necessary conditions to remain in compliance with this rule.

FRAQMD Rule 3.14 – Solvent Degreasing

SIP approved: 05-03-1982 (47 FR 18856)
Rule Description: This rule regulates emissions of volatile organic compounds from solvent containers greater than 55 gallons capacity.
Compliance Status: The permittee does not store solvents in containers which exceed 55 gallons capacity but will comply with the rule requirements if they do store such containers in the future.

FRAQMD Rule 3.15 – Architectural Coatings

SIP approved: 05-03-1982 (47 FR 18856)
Rule Description: This rule limits the quantity of volatile organic compounds in architectural coatings supplied, sold, offered for sale, applied, solicited for application or manufactured for use within the FRAQMD.
Compliance Status: The affected coatings used by the permittee are received and stored in containers that display the required manufacturer's labels and demonstrate compliance with the rule's requirements.

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS <u>Facility-wide Requirements</u>
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FRAQMD Rule 4.0 – General Requirements

SIP approved: 04-12-1982 (47 FR 15585)
Rule Description: This rule provides a procedure for the review of new sources of air pollution and of the modification and operation of existing sources through the issuance of permits.
Compliance Status: The permittee has obtained permits for all sources that require permits from the Air District.

FRAQMD Rule 4.1 – Permits Required

SIP approved: 04-12-1982 (47 FR 15585)
Rule Description: This rule requires an Authority to Construct and a Permit to Operate for sources of air contaminant emissions.
Compliance Status: The permittee has received permits for all sources that require permits from the Air District.

FRAQMD Rule 4.5 – Conditional Approval

SIP approved: 04-12-1982 (47 FR 15585)
Rule Description: This rule allows the FRAQMD Air Pollution Control Officer to issue permits with conditions that bring the operation of the subject equipment within the standards of the FRAQMD rules.
Compliance Status: The permittee has received conditional permits for sources at their facility that have been incorporated into the Title V permit.

FRAQMD Rule 4.14 – Posting of Permit

SIP approved: 04-12-1982 (47 FR 15585)
Rule Description: This rule requires that a permit be posted or be readily available at all times on the operating premises.
Compliance Status: The facility is expected to comply with the requirement. The permit will contain the necessary conditions to remain in compliance with this rule.

FRAQMD Rule 9.5 – Air Pollution Control Equipment – Scheduled Maintenance

SIP approved: 04-12-1982 (47 FR 15585)
Rule Description: This rule requires that the source notify the FRAQMD Air Pollution Control Officer of any shutdown of the air pollution control equipment.
Compliance Status: The facility is expected to comply with the requirement. The

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Facility-wide Requirements

permit will contain the necessary conditions to remain in compliance with this rule.

FRAQMD Rule 9.6 – Equipment Breakdown

SIP approved: 04-12-1982 (47 FR 15585)
Rule Description: This rule requires that the source notify the FRAQMD Air Pollution Control Officer of any breakdown of equipment that causes a violation of FRAQMD rules.
Compliance Status: The facility is expected to comply with the requirement. The permit will contain the necessary conditions to remain in compliance with this rule.

FRAQMD Rule 10.3 – Title V Federal Operating Permits

SIP approved: The rule is not SIP approved but the rule is applicable because it is part of the FRAQMD Title V Federal Operating Permit program approved by U.S. EPA on 11-21-2003 (68 FR 65637).
Rule Description: This rule sets forth the procedures for review, issuance, modification and renewal of Title V federal operating permits.
Compliance Status: The permittee has submitted a timely and complete Title V permit application. The permit will contain the necessary conditions to remain in compliance with this rule.

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Equipment Specific Requirements – Calpine Greenleaf II
Gas Turbine (S-1) and Duct Burner (S-2)

EQUIPMENT SPECIFIC REQUIREMENTS – Gas Turbine (S-1) & Duct Burner (S-2):

FRAQMD Rule 3.2 – Particulate Matter Concentrations

- SIP approved: 04-12-1982 (47 FR 15585)
- Rule Description: This rule regulates emissions of particulate matter (PM) from non-combustion and combustion processes. PM from combustion sources shall not exceed 0.3 grains/dscf corrected to 12% CO₂.
- Compliance Status: The operation of the gas turbine and duct burner is expected to comply with the particulate matter concentration requirement. However, the permittee requested a more stringent permit condition that this rule imposes. The Title V permit will contain a permit shield indicating that compliance with the conditions of the Title V permit will be deemed compliance with FRAQMD Rule 3.2.

(See discussion of streamlining multiple applicable requirements at the end of this section)

FRAQMD Rule 3.10 - Sulfur Oxides

- SIP approved: 04-12-1982 (47 FR 15585)
- Rule Description: This rule regulates emissions of sulfur oxides. SO₂ emissions shall not exceed 2,000 ppmv.
- Compliance Status: The operation of the gas turbine and duct burner is expected to comply with the sulfur oxides concentration requirement. However, the permittee requested a more stringent permit condition that this rule imposes. The Title V permit will contain a permit shield indicating that compliance with the conditions of the Title V permit will be deemed compliance with FRAQMD Rule 3.10.

(See discussion of streamlining multiple applicable requirements at the end of this section)

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Equipment Specific Requirements – Calpine Greenleaf II
Gas Turbine (S-1) and Duct Burner (S-2)

FRAQMD Rule 4.5 – Conditional Approval

SIP approved: 04-12-1982 (47 FR 15585)
Rule Description: This rule authorizes the APCO to impose conditions which will bring the permitted equipment into compliance with rules and regulations.
Compliance Status: FRAQMD Permit to Operate No. P13004 for the gas turbine and duct burner limits emission concentrations and mass emissions, and requires recordkeeping and reporting.

FRAQMD Rule 10.1 – New Source Review

Note: The following rule was not federally approved at the time of application.

SIP approved: Limited approval / Limited disapproval 07-27-2011 (76 FR 44809)
Rule Description: This rule establishes preconstruction review requirements including offsets, Best Available Control Technology (BACT), the analysis of air quality impacts for new and modified stationary sources, and to insure that the operation of such sources does not interfere with the attainment or maintenance of ambient air quality standards.

This rule also provides for a no net increase in emissions pursuant to Section 40918 and 40920 of the California Health and Safety Code.
Compliance Status: The gas turbine and duct burner were installed prior to the effective date of Rule 10.1. (02/08/1993) BACT is not applicable to the equipment units.

40 CFR 60 Subpart A (begin at 60.1) - General Provisions:

Promulgated: 11-17-1975 (40 FR 53346)
01-18-2008 (72 FR 3590) - Most recent amendment
Rule Description: This NSPS affects all facilities subject to source specific NSPS requirements. The regulations specifies general definitions and general requirements for notification, recordkeeping, performance tests, maintenance and monitoring
Compliance Status: The operation of the gas turbine and duct burner is expected to comply with the applicable Subpart A requirements.

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Equipment Specific Requirements – Calpine Greenleaf II
Gas Turbine (S-1) and Duct Burner (S-2)

40 CFR 60 Subpart Dc (begin at 60.40c) - NSPS for Industrial - Commercial - Institutional Steam Generating Units:

Note: This federal regulation is not an applicable federal requirement, but is discussed here to document the non-applicability of the regulation.

Promulgated: 11-25-1986 (51 FR 42768)
06-13-2007 (72 FR 32742) - Most recent amendment

Rule Description: This federal regulation applies to any steam generating unit capable of combusting less than 100 MMBTU/hour of fuels if it was construction commenced after June 9, 1989. The regulation limits NOx, PM, SO2 and opacity emissions.

Compliance Status: The gas turbine is not subject to this rule because it is not a "steam generating unit" as defined in 40 CFR 60.41b.

"*Steam generating unit*" means a device that combusts any fuel or byproduct/waste and produces steam or heats water or any other heat transfer medium. This term includes any municipal-type solid waste incinerator with a heat recovery steam generating unit or any steam generating unit that combusts fuel and is part of a cogeneration system or a combined cycle system. This term does not include process heaters as they are defined in this subpart."

The duct burner is considered a steam generating unit. However, construction commenced prior to June 9, 1989. Hence, the duct burner is not subject to the rule.

40 CFR 60 Subpart GG (begin at 60.330) - NSPS for Stationary Gas Turbines:

Promulgated: 09-10-1979 (44 FR 52798)
02-24-2006 (71 FR 9457) - Most recent amendment

Rule Description: This NSPS affects all stationary gas turbines with a heat input greater than 10 MMBTU/hour.

NOx Emission Limits [§60.332.a.1]

The gas turbine NOx emissions are required to not exceed:

$$1. \quad STD = 0.0075 \frac{(14.4)}{Y} + F$$

where:

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Equipment Specific Requirements – Calpine Greenleaf II
Gas Turbine (S-1) and Duct Burner (S-2)

STD = allowable ISO corrected NO_x emission concentration (percent by volume at 15 percent oxygen and on a dry basis),
Y = manufacturer's rated heat rate at manufacturer's rated load (kilojoules per watt hour) or, actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the facility. The value of Y shall not exceed 14.4 kilojoules per watt hour, and
F = NO_x emission allowance for fuel-bound nitrogen.

SO₂ Limits [§60.333]

The gas turbine SO₂ emissions are required to meet one of the following requirements:

2. Either:
 - a. Emission limit of 150 ppmvd of SO₂ at 15% O₂, or
 - b. Less than 0.8% (8,000 ppmw) sulfur by weight in the fuel.

Monitoring [§60.334.a, §60.334.c]

3. This permittee shall monitor either water-to-fuel ratio or operate a CEM system for NO_x and O₂.

Reporting [§60.334]

4. The permittee must report excess emissions of NO_x based on a 4-hour rolling average. The permittee must also report monitored downtime for the NO_x and O₂ monitor when sufficient data is not collected to validate any one hour period

Compliance Status: NO_x Emission Limits

1. The lowest possible NO_x emission limit based on the applicable equation in NSPS GG is 75 ppmv NO_x at 15% O₂. The gas turbine NO_x emission concentration is limited by permit condition to 6 ppmvd NO_x at 15% O₂. Hence, the permittee complies with the requirement.

SO₂ Limits

2. The fuel combusted in the turbine is natural gas. The sulfur content of natural gas is less than 0.5 grains per 100 cubic feet. Based on the sulfur content of natural gas, the sulfur concentration in the natural gas fuel is much less than 0.8% by weight.

Example calculation -

- a) 7000 grains = 1 lb

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Equipment Specific Requirements – Calpine Greenleaf II
Gas Turbine (S-1) and Duct Burner (S-2)

- b) 0.5 grains S/100 cubic feet = 0.00000714 lb S/ft³
- c) natural gas density is approximately 0.05 lb/ft³
- d) which results in a sulfur concentration in natural gas of approximately 0.0014% by weight.

Monitoring

- 3. The permittee operates a CEM system that measures and records NO_x and O₂ and complies with the monitoring requirements.

Reporting

- 4. The permittee complies with the requirement to report excess emissions of NO_x and monitor downtime.

The operation of the gas turbine is expected to comply with this federal NSPS. The monitoring and reporting conditions will be incorporated into the permit. However, the permittee requested more stringent NO_x and SO₂ emission limits than this rule imposes. The Title V permit will contain a permit shield indicating that compliance with the conditions of the Title V permit will be deemed compliance with the subsumed sections of 40 CFR 60 Subpart NSPS GG.

(See discussion of streamlining multiple applicable requirements at the end of this section)

40 CFR 60 Subpart KKKK (begin at 60.4300) – NSPS for Stationary Combustion Turbines:
Note: This federal regulation is not an applicable federal requirement, but is discussed here to document the non-applicability of the regulation.

Promulgated: 07-06-2006 (71 FR 38497)
Rule Description: This subpart establishes emission standards and compliance schedules for the control of emissions from stationary combustion turbines that commenced construction, modification or reconstruction after February 18, 2005.
Compliance Status: The gas turbine commenced construction prior to February 18, 2005 and has not been modified after that date; and therefore, is not subject to the NSPS.

40 CFR 63 Subpart Q – National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers:
Note: This federal regulation is not an applicable federal requirement, but is discussed here to document the non-applicability of the regulation.

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Equipment Specific Requirements – Calpine Greenleaf II
Gas Turbine (S-1) and Duct Burner (S-2)

Promulgated: 09-08-1994 (59 FR 46339)
Rule Description: This federal regulation prohibits the use of chromium in cooling tower water at major sources of HAP, beginning September 08, 1994.
Compliance Status: The cooling tower is not subject to the federal NESHAP for Industrial Process Cooling Towers because it is not located at a facility that is a major source for HAP.

40 CFR 63 Subpart YYYY - National Emission Standards for Hazardous Air Pollutants for Stationary Gas Turbines:

Note: This federal regulation is not an applicable federal requirement, but is discussed here to document the non-applicability of the regulation.

Promulgated: 03-05-2004 (69 FR 10511)
Rule Description: This federal regulation limits the emission of HAP from stationary gas turbines located at major sources of HAP.
Compliance Status: The gas turbine is not subject to the federal NESHAP for Stationary Gas Turbines because it is not located at a facility that is a major source for HAP.

40 CFR 64 Compliance Assurance Monitoring:

Note: This federal regulation is not an applicable federal requirement, but is discussed here to document the non-applicability of the regulation.

Promulgated: 10-22-1997 (52 FR 54940)
Rule Description: This federal regulation specifies monitoring requirements for Title V sources that will assure compliance with emission limitations or standards.
Compliance Status: Compliance Assurance Monitoring does not apply to the gas turbine SCR system because the Title V permit requires the use of a continuous compliance determination method [40 CFR 64.2(b)(1)(vi)], i.e. a continuous emissions monitoring system (CEMS) for NO_x.

40 CFR Parts 72 through 78 Acid Rain Program:

Note: This federal regulation is not an applicable federal requirement, but is discussed here to document the non-applicability of the regulation.

Promulgated: 01-11-1993 (58 FR 3650)
10-19-2007 (72 FR 59205) - Most recent amendment

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Equipment Specific Requirements – Calpine Greenleaf II
Gas Turbine (S-1) and Duct Burner (S-2)

Rule Description: This federal regulation limits the emission of NOx and SO2 from electric utility associated combustion equipment such as boilers and gas turbines in order to reduce acid rain.

Compliance Status: Compliance Status: 40 CFR 72.6(b)(5) exempts the following facilities from the Acid Rain Program requirements -

A qualifying facility that:

- (i) Has, as of November 15, 1990, one or more qualifying power purchase commitments to sell at least 15 percent of its total planned net output capacity; and
- (ii) Consists of one or more units designated by the owner or operator with total installed net output capacity not exceeding 130 percent of the total planned net output capacity. If the emissions rates of the units are not the same, the Administrator may exercise discretion to designate which units are exempt.

40 CFR 72.2 defines qualifying power purchase agreement -

A “Qualifying power purchase commitment” means a power purchase commitment in effect as of November 15, 1990 without regard to changes to that commitment so long as:

- (1) The identity of the electric output purchaser; or
- (2) The identity of the steam purchaser and the location of the facility, remain unchanged as of the date the facility commences commercial operation; and
- (3) The terms and conditions of the power purchase commitment are not changed in such a way as to allow the costs of compliance with the Acid Rain Program to be shifted to the purchaser.

The permittee has submitted documentation that:

- 1. The facility is a qualifying facility.
- 2. The identity of the 1990 electric output purchaser is PG&E has not changed from the original purchaser.
- 3. The identity of the 1990 steam purchaser is Sunsweet Growers and has not changed from the original purchaser.
- 4. The terms and conditions of the original 1990 power purchase agreement have not changed in such a way to allow the costs of compliance with the Acid

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Equipment Specific Requirements – Calpine Greenleaf II
Gas Turbine (S-1) and Duct Burner (S-2)

Rain Program to be shifted to the purchaser.

The permittee's facility meets all of the requirements of the exemption in 40 CFR 72.6(b)(5) and is therefore exempt from the Acid Rain Program requirements.

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Equipment Specific Requirements – Calpine Greenleaf II
Gas Turbine (S-1) and Duct Burner (S-2)

Streamlining Multiple Applicable Requirements:

NOx & SO2 streamlining:

The gas turbine and duct burner combination is subject to the following overlapping Applicable Federally Enforceable Requirements for NOx and SO2:

Applicable Requirement	Emission Limits	
	NOx	SO2
40 CFR 60 Subpart GG NSPS for Gas Turbines (amended 02-24-2006)	75 ppm @ 15% O2 [§60.332.a.1]	150 ppmvd @ 15% O2 or 8,000 ppmw S in the fuel [§60.333]
FRAQMD Rule No. 3.10 - Sulfur Oxides		0.2 % by volume (2,000 ppmv)
Permit conditions in Authority to Construct and Permit to Operate imposed by FRAQMD Rule 4.5 Conditional Approval	6 ppm @ 15% O2	0.2 lb/hr (~ 0.09 ppmvd @ 15% O2) (A)

(A) The following is the calculation of the concentration equivalent, in ppmv, of the lb/hour mass emission limit for SO2:

$$\begin{aligned}
 \text{SO}_2, \text{ ppmv in the exhaust gas} &= \frac{\text{Volume of SO}_2 \text{ in the gas turbine exhaust}}{\text{Total volume of gas turbine exhaust}} \\
 &= \frac{(0.2 \text{ lb SO}_2/\text{hour}) \times (379 \text{ dscf SO}_2/\text{lb mole SO}_2) / (64 \text{ lb SO}_2/\text{lb mole SO}_2)}{(13,737,180 \text{ dscf/hour exhaust gas, from 06-08-2012 source test})} \\
 &= 0.09 \text{ ppmv SO}_2
 \end{aligned}$$

Pursuant to U.S. EPA White Paper Number 2, the above applicable requirements for NOx and SO2 will be streamlined. Only the permit conditions in the Authority to Construct and Permit to Operate imposed by FRAQMD Rule 4.5, which are the most stringent requirements, will be incorporated into the Title V permit. A permit shield condition will incorporate the applicable sections of NSPS GG and District Rule 3.10 that are subsumed by the more stringent overlapping requirements.

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
**Equipment Specific Requirements – Calpine Greenleaf II
 Gas Turbine (S-1) and Duct Burner (S-2)**

PM streamlining:

The gas turbine is subject to the following overlapping Applicable Federally Enforceable Requirements for PM:

Applicable Requirement	Emission Limits
FRAQMD Rule 3.2 – Particulate Matter Concentration	0.3 grains/dscf at 12% CO2
Permit condition in Authority to Construct and Permit to Operate imposed by FRAQMD Rule 4.5 Conditional Approval	3.4 lbs/hour (equivalent to 0.0059 grains/dscf at 12% CO2) (A)

(A) The following is the calculation of the PM concentration limit, in grains/dscf, equivalent to the mass emission limit in lbs/hour:

$$\begin{aligned}
 \text{PM, grains/dscf} &= \frac{(3.4 \text{ lb/hour}) \times (7,000 \text{ grains/lb})}{(13,737,180 \text{ dscf/hour exhaust gas, from 06-08-2012 source test})} \\
 &= 0.0017 \text{ grains/dscf (at approximately 3.44\% CO}_2\text{)} \\
 &= 0.0059 \text{ grains/dscf (at 12\% CO}_2\text{)}
 \end{aligned}$$

Pursuant to U.S. EPA White Paper Number 2, the above applicable requirement for PM will be streamlined. Only the permit condition in the Authority to Construct and Permit to Operate imposed by FRAQMD Rule 4.5, which is the most stringent requirement, will be incorporated into the Title V permit. A permit shield condition will incorporate Rule 3.2 as it is subsumed by the more stringent overlapping requirement.

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Equipment Specific Requirements
IC Engine (S-3)

EQUIPMENT SPECIFIC REQUIREMENTS – IC engine (S-3):

FRAQMD Rule 3.2 - Particulate Matter Concentrations

SIP approved: 04-12-1982 (47 FR 15585)
Rule Description: This rule regulates emissions of particulate matter (PM) from non-combustion and combustion processes. PM from combustion sources shall not exceed 0.3 grains/dscf corrected to 12% CO₂.
Compliance Status: The operation of the IC Engine (S-3) is expected to comply with the PM concentration requirement.

PM Emissions

Emission Factor (Source AP42 3.2 07/2000)
= 9.50E-03 (PM10 filterable) + 9.91E-03 (PM condensable)
= 1.94E-02 lb/MMBtu fuel input

Example Calculation:

$C = E / F_d$, where:
C = Concentration (lb / dscf)
E = Emission Factor (lb / MMBTU natural gas)
F_d = F-Factor (8710 dscf / MMBtu natural gas)

$C = [1.94E-02 \text{ lb/MMBTU}] / [8710 \text{ dscf / MMBTU}]$
C = 2.23E-06 lb/dscf

PM = 2.23E-06 lb/dscf * 7000 grains/lb
PM = 0.156 grains/dscf

FRAQMD Rule 3.10 - Sulfur Oxides

SIP approved: 04-12-1982 (47 FR 15585)
Rule Description: This rule regulates emissions of sulfur oxides. SO₂ emissions shall not exceed 2,000 ppmv.
Compliance Status: The operation of the IC Engine (S-3) is expected to comply with the sulfur oxides concentration requirement.

SO_x Emissions

Emission Factor (Source AP42 3.2 07/2000)
= 5.88E-04 lb/MMBtu

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Equipment Specific Requirements
IC Engine (S-3)

Example Calculation:

$C = E / F_d$, where:

C = Concentration (lb / dscf)

E = Emission Factor (lb / MMBTU natural gas)

F_d = F-Factor (8710 dscf / MMBtu natural gas)

$C = [5.88E-04 \text{ lb/MMBtu}] / [8710 \text{ dscf / MMBTU}]$

$C = 6.75E-08 \text{ lb/dscf}$

$\text{ppmv} = \text{Volume SO}_2 / \text{Volume exhaust}$

$\text{ppmv} = (6.75E-08 \text{ lb SO}_2/\text{dscf exhaust}) \times (379 \text{ dscf SO}_2/\text{lb mole SO}_2) / (64 \text{ lb SO}_2/\text{lb mole SO}_2)$

$\text{ppmv} = 0.40 \text{ ppmv}$

FRAQMD Rule 3.22 – Stationary Internal Combustion Engines

Note: The following rule was not federally approved at the time of application.

SIP approved: Limited approval / Limited disapproval 03-01-2012
(77 FR 12493)

Rule Description: Rule 3.22 applies to all internal combustion engines with rated break horsepower greater than or equal to fifty (>50 bhp) used in industrial, institutional, and commercial operations that operate within the boundaries of the District.

Compliance Status: Rule 3.22 exempts emergency standby engines whose total annual hours for maintenance and testing purposes do not exceed 100 hours as determined by a nonresettable hour meter. Hours used specifically for emergencies shall not be limited by this rule.

The engine will have conditions limiting the hours of operation for maintenance and testing to 100 hours per calendar year.

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Equipment Specific Requirements
IC Engine (S-3)

FRAQMD Rule 4.5 – Conditional Approval

SIP approved: 04-12-1982 (47 FR 15585)
Rule Description: This rule authorizes the APCO to impose conditions which will bring the permitted equipment into compliance with rules and regulations.
Compliance Status: FRAQMD Permit to Operate No. P13004 for the IC Engine (S-3) limits emission concentrations, limits mass emissions, and requires recordkeeping and reporting.

FRAQMD Rule 10.1 – New Source Review

Note: The following rule was not federally approved at the time of application.

SIP approved: Limited approval / Limited disapproval 07-27-2011
(76 FR 44809)

Rule Description: This rule establishes preconstruction review requirements including offsets, Best Available Control Technology (BACT), the analysis of air quality impacts for new and modified stationary sources, and to insure that the operation of such sources does not interfere with the attainment or maintenance of ambient air quality standards.

This rule also provides for a no net increase in emissions pursuant to Section 40918 and 40920 of the California Health and Safety Code.

Compliance Status: The IC Engine (S-3) was evaluated for BACT at the time of application (09-04-2003). BACT was not triggered for federal requirements, but was triggered under the no net increase provisions for ozone precursors (NOx and VOC). BACT was determined to be 0.15 g/bhp-hr for both NOx and VOC, which is achievable by using Non-selective catalytic reduction via a 3-way catalytic converter.

Offsets were provided for the emissions increase of the project under the no net increase provisions. The preliminary decision was public noticed on January 20, 2004. No comments were received.

40 CFR 60 Subpart A (begin at 60.1) - General Provisions:

Promulgated: 11-17-1975 (40 FR 53346)
01-18-2008 (72 FR 3590) - Most recent amendment

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Equipment Specific Requirements
IC Engine (S-3)

Rule Description: This NSPS affects all facilities subject to source specific NSPS requirements. The regulations specifies general definitions and general requirements for notification, recordkeeping, performance tests, maintenance and monitoring

Compliance Status: The operation of IC Engine (S-3) is expected to comply with the applicable Subpart A requirements.

40 CFR 60 Subpart JJJJ (begin at 60.330) - NSPS for Stationary Spark Ignition Internal Combustion Engines:

Note: This federal regulation is not an applicable federal requirement, but is discussed here to document the non-applicability of the regulation.

Promulgated: 01-18-2008 (73 FR 3591)
01-30-2013 (78 FR 6674) - Most recent amendment

Rule Description: This NSPS is applicable to manufacturers, owners, and operators of stationary spark ignition (SI) internal combustion engines (ICE) greater than 19KW that commenced construction:

- (i) On or after July 1, 2008; or
- (ii) On or after January 1, 2009, for emergency engines.

Compliance Status: This NSPS is not applicable, since the emergency engine was manufactured and installed prior to January 1, 2009.

40 CFR 63 Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines:

Promulgated: 06-15-2004 (69 FR 33473)
01-30-2013 (78 FR 6674) - Most recent amendment

Rule Description: This federal regulation limits the emission of HAP or sets management practices for existing stationary internal combustion engines located at major sources and area sources of HAP.

Compliance Status: The emergency compressor was installed in 2003, and so it is an existing engine at an area source of HAP. Industrial Emergency SI engines are required to maintain management practices, such as changing the oil & oil filter and inspecting the hoses, belts, and spark plugs after a pre-determined amount of hours of operation or annually. The engine is also limited to operating up to 100 hours per year for maintenance and testing.

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Equipment Specific Requirements
IC Engine (S-3)

The permit will outline the required maintenance procedures. It is anticipated that the facility will comply with the requirements.

40 CFR 64 Compliance Assurance Monitoring:

Note: This federal regulation is not an applicable federal requirement, but is discussed here to document the non-applicability of the regulation.

Promulgated: 10-22-1997 (52 FR 54940)
Rule Description: This federal regulation specifies monitoring requirements for Title V sources that will assure compliance with emission limitations or standards.
Compliance Status: Compliance assurance monitoring does not apply to the IC Engine (S-3) since the emissions of the engine before the control device do not exceed the major source threshold (100 tpy).

NOx emissions

EF = 13 g/bhp-hr NOx, 9 g/bhp-hr CO, 2 g/bhp-hr VOC
NOx is the highest EF. Hence, it will be used in the calculations.

$$E = 13 \text{ g/bhp-hr NOx} * 810 \text{ bhp} * [1 \text{ lb} / 453.59 \text{ g}] * 100 \text{ hrs/year}$$

$$E = 2,319 \text{ lbs/year}$$

$$E = 1.16 \text{ tons/year}$$

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Equipment Specific Requirements
Gas Turbine (S-4)

EQUIPMENT SPECIFIC REQUIREMENTS – Gas Turbine (S-4):

FRAQMD Rule 3.2 - Particulate Matter Concentrations

- SIP approved: 04-12-1982 (47 FR 15585)
- Rule Description: This rule regulates emissions of particulate matter (PM) from non-combustion and combustion processes. PM from combustion sources shall not exceed 0.3 grains/dscf corrected to 12% CO₂.
- Compliance Status: The operation of the gas turbine is expected to comply with the particulate matter concentration requirement. However, the permittee requested a more stringent permit condition that this rule imposes. The Title V permit will contain a permit shield indicating that compliance with the conditions of the Title V permit will be deemed compliance with FRAQMD Rule 3.2.

(See discussion of streamlining multiple applicable requirements at the end of this section)

FRAQMD Rule 3.10 - Sulfur Oxides

- SIP approved: 04-12-1982 (47 FR 15585)
- Rule Description: This rule regulates emissions of sulfur oxides. SO₂ emissions shall not exceed 2,000 ppmv.
- Compliance Status: The operation of the gas turbine is expected to comply with the sulfur oxides concentration requirement. However, the permittee requested a more stringent permit condition that this rule imposes. The Title V permit will contain a permit shield indicating that compliance with the conditions of the Title V permit will be deemed compliance with FRAQMD Rule 3.10.

(See discussion of streamlining multiple applicable requirements at the end of this section)

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Equipment Specific Requirements
Gas Turbine (S-4)

FRAQMD Rule 4.5 – Conditional Approval

SIP approved: 04-12-1982 (47 FR 15585)
Rule Description: This rule authorizes the APCO to impose conditions which will bring the permitted equipment into compliance with rules and regulations.
Compliance Status: FRAQMD Permit to Operate No. P13004 for the gas turbine limits the emission concentrations and mass emissions, and requires recordkeeping and reporting.

FRAQMD Rule 10.1 – New Source Review

Note: The following rule was not federally approved at the time of application.

SIP approved: Limited approval / Limited disapproval 07-27-2011
(76 FR 44809)

Rule Description: This rule establishes preconstruction review requirements including offsets, Best Available Control Technology (BACT), the analysis of air quality impacts for new and modified stationary sources, and to insure that the operation of such sources does not interfere with the attainment or maintenance of ambient air quality standards.

This rule also provides for a no net increase in emissions pursuant to Section 40918 and 40920 of the California Health and Safety Code.

Compliance Status: The gas turbine (S-4) was evaluated for BACT at the time of application (01/29/2001). BACT was not triggered for federal requirements, but was triggered under the no net increase provisions for ozone precursors (NOx and VOC). BACT for NOx was determined to be 5 ppmvd @ 15% O2. BACT for VOC was determined to be 2 ppmvd @ 15% O2 or 0.0027 lb/MMBtu HHV. These values were derived from the California Air Resources Board's "Guidance for Power Plant Siting and Best Available Control Technology, September 1999"

Offsets were provided for the emissions increase of the project under the no net increase provisions. The preliminary decision was public noticed on January 22, 2003. No comments were received.

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Equipment Specific Requirements
Gas Turbine (S-4)

40 CFR 60 Subpart A (begin at 60.1) - General Provisions:

- Promulgated: 11-17-1975 (40 FR 53346)
01-18-2008 (72 FR 3590) - Most recent amendment
- Rule Description: This NSPS affects all facilities subject to source specific NSPS requirements. The regulations specifies general definitions and general requirements for notification, recordkeeping, performance tests, maintenance and monitoring.
- Compliance Status: The operation of Gas Turbine (S-4) is expected to comply with the applicable Subpart A requirements.

40 CFR 60 Subpart Db (begin at 60.40b) - NSPS for Industrial - Commercial - Institutional Steam Generating Units:

Note: This federal regulation is not an applicable federal requirement, but is discussed here to document the non-applicability of the regulation.

- Promulgated: 11-25-1986 (51 FR 42768)
06-13-2007 (72 FR 32742) - Most recent amendment
- Rule Description: This federal regulation applies to any steam generating unit capable of combusting greater than 100 MMBTU/hour of fuels if it was constructed after June 19, 1984. The regulation limits NO_x, PM, SO₂ and opacity emissions.
- Compliance Status: The gas turbine is not subject to this rule because it is not a "steam generating unit" as defined in 40 CFR 60.41b.
- "*Steam generating unit*" means a device that combusts any fuel or byproduct/waste and produces steam or heats water or any other heat transfer medium. This term includes any municipal-type solid waste incinerator with a heat recovery steam generating unit or any steam generating unit that combusts fuel and is part of a cogeneration system or a combined cycle system. This term does not include process heaters as they are defined in this subpart."

40 CFR 60 Subpart GG (begin at 60.330) - NSPS for Stationary Gas Turbines:

- Promulgated: 09-10-1979 (44 FR 52798)
02-24-2006 (71 FR 9457) - Most recent amendment

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Equipment Specific Requirements
Gas Turbine (S-4)

Rule Description: This NSPS affects all stationary gas turbines with a heat input greater than 10 MMBTU/hour.

NOx Emission Limits [§60.332.a.1]

The gas turbine NOx emissions are required to not exceed:

$$1. \quad STD = 0.0075 \frac{(14.4)}{Y} + F$$

where:

STD = allowable ISO corrected NOx emission concentration (percent by volume at 15 percent oxygen and on a dry basis),
Y = manufacturer's rated heat rate at manufacturer's rated load (kilojoules per watt hour) or, actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the facility. The value of Y shall not exceed 14.4 kilojoules per watt hour, and

F = NOX emission allowance for fuel-bound nitrogen.

SO2 Limits [§60.333]

The gas turbine SO2 emissions are required to meet one of the following requirements:

2. Either:
 - a. Emission limit of 150 ppmvd of SO2 at 15% O2, or
 - b. Less than 0.8% (8,000 ppmw) sulfur by weight in the fuel.

Monitoring [§60.334.a, §60.334.c]

3. This permittee shall monitor either water-to-fuel ratio or operate a CEM system for NOx and O2.

Reporting [§60.334]

4. The permittee must report excess emissions of NOx based on a 4-hour rolling average. The permittee must also report monitored downtime for the NOx and O2 monitor when sufficient data is not collected to validate any one hour period

Compliance Status: NOx Emission Limits

1. The lowest possible NOx emission limit based on the applicable equation in NSPS GG is 75 ppmv NOx at 15% O2. The gas turbine NOx emission concentration is limited by permit condition to 5 ppmvd NOx at 15% O2. Hence, the permittee complies with the requirement.

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Equipment Specific Requirements
Gas Turbine (S-4)

SO₂ Limits

2. The fuel combusted in the turbine is natural gas. The sulfur content of natural gas is less than 0.5 grains per 100 cubic feet. Based on the sulfur content of natural gas, the sulfur concentration in the natural gas fuel is much less than 0.8% by weight.

Example calculation -

- a) 7000 grains = 1 lb
- b) 0.5 grains S/100 cubic feet = 0.000000714 lb S/ft³
- c) natural gas density is approximately 0.05 lb/ft³
- d) which results in a sulfur concentration in natural gas of approximately 0.0014% by weight.

Monitoring

3. The permittee operates a CEM system that measures and records NO_x and O₂ and complies with the monitoring requirements.

Reporting

4. The permittee complies with the requirement to report excess emissions of NO_x and monitor downtime.

The operation of the gas turbine is expected to comply with this federal NSPS. The monitoring and reporting conditions will be incorporated into the permit. However, the permittee requested more stringent NO_x and SO₂ emission limits than this rule imposes. The Title V permit will contain a permit shield indicating that compliance with the conditions of the Title V permit will be deemed compliance with the subsumed sections of 40 CFR 60 Subpart NSPS GG.

(See discussion of streamlining multiple applicable requirements at the end of this section)

40 CFR 60 Subpart KKKK (begin at 60.4300) – NSPS for Stationary Combustion Turbines:
Note: This federal regulation is not an applicable federal requirement, but is discussed here to document the non-applicability of the regulation.

Promulgated: 07-06-2006 (71 FR 38497)
Rule Description: This subpart establishes emission standards and compliance schedules for the control of emissions from stationary

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Equipment Specific Requirements

Gas Turbine (S-4)

combustion turbines that commenced construction, modification or reconstruction after February 18, 2005.
Compliance Status: The gas turbine commenced construction prior to February 18, 2005 and has not been modified after that date; and therefore, is not subject to the NSPS.

40 CFR 63 Subpart Q – National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers:

Note: This federal regulation is not an applicable federal requirement, but is discussed here to document the non-applicability of the regulation.

Promulgated: 09-08-1994 (59 FR 46339)
Rule Description: This federal regulation prohibits the use of chromium in cooling tower water at major sources of HAP, beginning September 08, 1994.
Compliance Status: The cooling tower is not subject to the federal NESHAP for Industrial Process Cooling Towers because it is not located at a facility that is a major source for HAP.

40 CFR 63 Subpart YYYY - National Emission Standards for Hazardous Air Pollutants for Stationary Gas Turbines:

Note: This federal regulation is not an applicable federal requirement, but is discussed here to document the non-applicability of the regulation.

Promulgated: 03-05-2004 (69 FR 10511)
Rule Description: This federal regulation limits the emission of HAP from stationary gas turbines located at major sources of HAP.
Compliance Status: The gas turbine is not subject to the federal NESHAP for Stationary Gas Turbines because it is not located at a facility that is a major source for HAP.

40 CFR 64 Compliance Assurance Monitoring:

Note: This federal regulation is not an applicable federal requirement, but is discussed here to document the non-applicability of the regulation.

Promulgated: 10-22-1997 (52 FR 54940)
Rule Description: This federal regulation specifies monitoring requirements for Title V sources that will assure compliance with emission limitations or standards.

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Equipment Specific Requirements
Gas Turbine (S-4)

Compliance Status: Compliance Assurance Monitoring does not apply to the gas turbine SCR system because the Title V permit requires the use of a continuous compliance determination method [40 CFR 64.2(b)(1)(vi)], i.e. a continuous emissions monitoring system (CEMS) for NO_x.

40 CFR Parts 72 through 78 Acid Rain Program:

Promulgated: 01-11-1993 (58 FR 3650)
10-19-2007 (72 FR 59205) – Most recent amendment

Rule Description: This federal regulation limits the emission of NO_x and SO₂ from electric utility associated combustion equipment such as boilers and gas turbines in order to reduce acid rain.

Compliance Status: The permittee submitted an acid rain application in 2001 and has updated the application as appropriately. The Title V permit will contain the necessary conditions to remain in compliance with the Acid Rain Program.

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Equipment Specific Requirements
Gas Turbine (S-4)

Streamlining Multiple Applicable Requirements:

NOx & SO2 streamlining:

The gas turbine is subject to the following overlapping Applicable Federally Enforceable Requirements for NOx and SO2:

Applicable Requirement	Emission Limits	
	NOx	SO2
40 CFR 60 Subpart GG NSPS for Gas Turbines (amended 02-24-2006)	75 ppm @ 15% O2 [§60.332.a.1]	150 ppmvd @ 15% O2 or 8,000 ppmw S in the fuel [§60.333]
FRAQMD Rule No. 3.10 - Sulfur Oxides		0.2 % by volume (2,000 ppmv)
Permit conditions in Authority to Construct and Permit to Operate imposed by FRAQMD Rule 4.5 Conditional Approval	5 ppm @ 15% O2	0.3 lb/hr (~ 0.16 ppmvd @ 15% O2) (A)

(A) The following is the calculation of the concentration equivalent, in ppmv, of the lb/hour mass emission limit for SO2:

$$\begin{aligned}
 \text{SO}_2, \text{ ppmv in the exhaust gas} &= \frac{\text{Volume of SO}_2 \text{ in the gas turbine exhaust}}{\text{Total volume of gas turbine exhaust}} \\
 &= \frac{(0.3 \text{ lb SO}_2/\text{hour}) \times (379 \text{ dscf SO}_2/\text{lb mole SO}_2) / (64 \text{ lb SO}_2/\text{lb mole SO}_2)}{(13,006,200 \text{ dscf/hour exhaust gas, from the 06-07-2012 source test})} \\
 &= 0.14 \text{ ppmv SO}_2
 \end{aligned}$$

Pursuant to U.S. EPA White Paper Number 2, the above applicable requirements for NOx and SO2 will be streamlined and only the permit condition related requirements, which are the most stringent requirements, will be incorporated into the Title V permit. A permit shield condition will incorporate the applicable sections of NSPS GG and District Rule 3.10 that are subsumed by the more stringent overlapping requirement.

APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
Equipment Specific Requirements
Gas Turbine (S-4)

PM streamlining:

The gas turbine is subject to the following overlapping Applicable Federally Enforceable Requirements for PM:

Applicable Requirement	Emission Limits
FRAQMD Rule 3.2	0.3 grains/dscf at 12% CO2
Permit conditions in Authority to Construct and Permit to Operate imposed by FRAQMD Rule 4.5 Conditional Approval	2.5 lbs/hour (equivalent to 0.0064 grains/dscf at 12% CO2) (A)

(A) The following is the calculation of the PM concentration limit, in grains/dscf, equivalent to the mass emission limit in lbs/hour:

$$\begin{aligned}
 \text{PM, grains/dscf} &= \frac{(2.5 \text{ lb/hour}) \times (7,000 \text{ grains/lb})}{(13,006,200 \text{ dscf/hour exhaust gas, from the 06-07-2012 source test})} \\
 &= 0.00134 \text{ grains/dscf (at approximately 2.51\% CO}_2\text{)} \\
 &= 0.0064 \text{ grains/dscf (at 12\% CO}_2\text{)}
 \end{aligned}$$

Pursuant to U.S. EPA White Paper Number 2, the above applicable requirements for PM will be streamlined and only the permit condition related requirement, which is the most stringent requirement, will be incorporated into the Title V permit. A permit shield condition will incorporate Rule 3.2 as it is subsumed by the more stringent overlapping requirement.

<i>NON</i>-FEDERALLY ENFORCEABLE REQUIREMENTS <u>Facility-wide Requirements</u>
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The following FRAQMD rules are not SIP approved, but are applicable to the facility. The Title V permit will list the relevant rules as non-federally enforceable applicable requirements. These rule requirements are only enforceable by the FRAQMD and not by the U.S. EPA and the public.

- 3.6 Abrasive Blasting - adopted 06/1991 version
- 3.15 Architectural Coatings - amended 11/13/2002 version
- 3.16 Fugitive Dust Emissions - adopted 04/11/1994 version
- 4.3 Exemptions from Permit - amended 10/01/2007 version
- 4.4 Standards for Granting Applications - amended 11/1993 version
- 4.6 Standards for Authority to Construct and Permit to Operate
- 4.7 Denial of Application
- 4.9 Action on Applications - adopted 08/1991 version
- 4.10 Appeals - adopted 08/1991 version
- 4.11 State Ambient Air Quality Standards - adopted 08/1991 version
- Regulation 5 Hearing Board Procedures
- Regulation 6 Variances
- Regulation 7 Fees (except for Title V relevant rules)
- Regulation 8 Penalties and Abatement
 - 9.0 Enforcement
 - 9.4 Field Inspection
 - 9.7 Permit
 - 9.8 Variance Action
 - 9.9 Notice to Comply
- 10.2 Emission Reduction Credit and Banking Credit
- 10.8 Federal Major Modifications
- 11.1 State Airborne Toxic Control Measures

TITLE V PERMIT CONDITIONS:

It is recommended that the Calpine Greenleaf II and Yuba City Energy Center Title V Federal Operating permit is issued.

See Title V Federal Operating Permit No. 13004 for permit conditions.

Prepared By:

Date:

Approved By:

Date:

ATTACHMENT A

FRAQMD RULES THAT ARE
“APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS”
FOR CALPINE GREENLEAF II & YUBA CITY ENERGY CENTER

FRAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR Calpine Greenleaf II & Yuba City Energy Center

	Indicates a SIP approved rule that has been deleted from the current FRAQMD Rules and Regulations, but not deleted from the SIP.
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Rule is Applicable	Rule is SIP Approved	Federally Enforceable	Rule No.	Rule Title	Title V/Federally Enforceable Notes
	●		1.0	Title SIP approved 04/12/1982	
●	●	●	1.1	Definitions SIP approved 04/12/1982	There are no related conditions included in the permit because of the general nature of the rule.
●			1.1	Definitions amended 8/1/2011	
●	●	●	1.2	Validity SIP approved 04/12/1982	There are no related conditions included in the permit because of the general nature of the rule.
	●		1.3	Effective Date SIP approved 04/12/1982	
			2.0	Open Burning amended 03/01/2004	
	●		2.01	Exceptions to Rule 2.0 SIP approved 04/12/1982	
	●		2.02	APCO May Issue Burn Permit SIP approved 04/12/1982	

FRAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR Calpine Greenleaf II & Yuba City Energy Center

Rule is Applicable	Rule is SIP Approved	Federally Enforceable	Rule No.	Rule Title	Title V/Federally Enforceable Notes
	●		2.03	Burning on "No-Burn" Days SIP approved 04/12/1982	
	●		2.04	Exception to Rule 2.3 SIP approved 04/12/1982	
	●		2.05	Permit Regulations SIP approved 04/12/1982	
	●		2.06	Burning Hours SIP approved 04/12/1982	
	●		2.07	Agricultural Burning Requirement SIP approved 04/12/1982	
	●		2.08	Range Improvement and Property Being Developed for Commercial or Residential Purposes SIP approved 04/12/1982	
	●		2.082	Open Burning of Wood Waste on property Where Grown SIP approved 04/12/1982	
	●		2.09	Prohibited Burning SIP approved 04/12/1982	
	●		2.10	Exceptions	

FRAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR Calpine Greenleaf II & Yuba City Energy Center

Rule is Applicable	Rule is SIP Approved	Federally Enforceable	Rule No.	Rule Title	Title V/Federally Enforceable Notes
				SIP approved 04/12/1982	
	●		2.11	Fire Prevention SIP approved 04/12/1982	
	●		2.12	Designated Agencies SIP approved 04/12/1982	
	●		2.14	Reduction of Odorous Matter SIP approved 04/12/1982	
	●		2.15	Orchard and Citrus Heaters SIP approved 04/12/1982	
	●		2.16	Cost of Putting Out a Fire SIP approved 04/12/1982	
●	●	●	3.0	Visible Emissions SIP approved 04/12/1982	The related conditions are included in the permit.
	●		3.1	Exceptions to Rule 3.0 SIP approved 04/12/1982	
●	●	●	3.2	Particulate Matter Concentration SIP approved 04/12/1982	The related conditions are included in the permit.
	●		3.3	Dust and Fumes SIP approved 04/12/1982	

FRAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR Calpine Greenleaf II & Yuba City Energy Center

Rule is Applicable	Rule is SIP Approved	Federally Enforceable	Rule No.	Rule Title	Title V/Federally Enforceable Notes
●	●	●	3.4	Separation of Emissions SIP approved 04/12/1982	There are no related conditions included in the permit because of the general nature of the rule.
●	●	●	3.5	Combination of Emissions SIP approved 04/12/1982	There are no related conditions included in the permit because of the general nature of the rule.
●	●	●	3.6	Sand Blasting SIP approved 04/12/1982	There are no related conditions included in the permit because of the general nature of the rule.
●			3.6	Abrasive Blasting amended 06/1991	
	●		3.7	Reduction of Animal Matter SIP approved 04/12/1982	
	●		3.8	Storage and Transfer of Gasoline SIP approved 04/12/1982	
	●		3.9	Incinerator Burning SIP approved 04/12/1982	
			3.9	Storage of Petroleum Products adopted 06/1991	
●	●	●	3.10	Sulfur Oxides SIP approved 04/12/1982	The related conditions are included in the permit.

FRAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR Calpine Greenleaf II & Yuba City Energy Center

Rule is Applicable	Rule is SIP Approved	Federally Enforceable	Rule No.	Rule Title	Title V/Federally Enforceable Notes
●	●	●	3.11	Posting of Permit SIP approved 04/12/1982	There are no related conditions included in the permit because of the general nature of the rule.
			3.11	Reduced Sulfur Compounds adopted 06/1991	
●	●	●	3.12	Organic Solvents SIP approved 04/12/1982	There are no related conditions included in the permit because of the general nature of the rule.
			3.12	Benzene ATCM – Retail Service Stations adopted 06/1991	
●	●	●	3.13	Circumvention SIP approved 04/12/1982	The related conditions are included in the permit.
●	●	●	3.14	Solvent Degreasing SIP approved 04/12/1982	The related conditions are included in the permit.
●			3.14	Surface Preparation and Clean-up amended 8/1/2011	
●	●	●	3.15	Architectural Coatings SIP approved 05/03/1982	The related conditions are included in the permit.
●			3.15	Architectural Coatings amended 11/13/2002	
●			3.16	Fugitive Dust Emissions	

FRAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR Calpine Greenleaf II & Yuba City Energy Center

Rule is Applicable	Rule is SIP Approved	Federally Enforceable	Rule No.	Rule Title	Title V/Federally Enforceable Notes
				adopted 04/11/1994	
			3.17	Wood Heating Devices amended 10/2009	
			3.18	Standards for Municipal Solid Waste Landfills adopted 6/02/1997	
			3.19	Vehicle and Mobile Equipment Coating Operations amended 8/1/2011	
			3.20	Wood Products Coating Operations amended 8/1/2011	
			3.21	Industrial, Institutional, and Commercial Boilers, Steam Generators and Process Heaters adopted 06/05/2006	
●	*	●	3.22	Stationary Internal Combustion Engines adopted 06/01/2009	The related conditions are included in the permit. (*Limited approval / Limited disapproval [77 FR 12493, 03-01-2012])
●	●	●	4.0	General Requirements SIP approved 04/12/1982	There are no related conditions included in the permit because of the general nature of the rule.
●	●	●	4.1	Permit Requirements SIP approved 04/12/1982	There are no related conditions included in the permit because of the general nature of the rule.

FRAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR Calpine Greenleaf II & Yuba City Energy Center

Rule is Applicable	Rule is SIP Approved	Federally Enforceable	Rule No.	Rule Title	Title V/Federally Enforceable Notes
●	●	●	4.2	Existing Emission Sources SIP approved 04/12/1982	There are no related conditions included in the permit because of the general nature of the rule.
●	●	●	4.3	Exemptions from Permit SIP approved 04/12/1982	There are no related conditions included in the permit because of the general nature of the rule.
●			4.3	Exemptions from Permit amended 10/01/2007	
●	●	●	4.4	Standards for Granting Applications SIP approved 04/12/1982	There are no related conditions included in the permit because of the general nature of the rule.
●			4.4	Standards for Granting Applications amended 11/1993	
●	●	●	4.5	Conditional Approval SIP approved 04/12/1982	The related conditions are included in the permit.
	●		4.6	Daily Limits SIP approved 09/22/1972	The permittee does not conduct agricultural burning.
●			4.6	Standards for Authority to Construct and Permit to Operate amended 06/07/2004	
●			4.7	Denial of Application	
●	●	●	4.8	Public Information	There are no related conditions included in the permit

FRAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR Calpine Greenleaf II & Yuba City Energy Center

Rule is Applicable	Rule is SIP Approved	Federally Enforceable	Rule No.	Rule Title	Title V/Federally Enforceable Notes
				SIP approved 04/12/1982	because of the general nature of the rule.
●			4.9	Action on Applications adopted 08/1991	
●			4.10	Appeals adopted 08/1991	
	●		4.11	Range Improvement Burning SIP approved 02/10/1977	
●			4.11	State Ambient Air Quality Standards adopted 08/1991	
	●		4.12	Implementation Plans SIP approved 04/12/1982	
●	●	●	4.13	Alteration of Permit SIP approved 04/12/1982	There are no related conditions included in the permit because of the general nature of the rule.
●	●	●	4.14	Posting of Permit SIP approved 04/12/1982	There are no related conditions included in the permit because of the general nature of the rule.
●	●	●	4.15	Transfer of Permit SIP approved 04/12/1982	There are no related conditions included in the permit because of the general nature of the rule.
			4.16	Registration Requirements for Compression Ignition Engines Used in Agricultural Operations	

FRAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR Calpine Greenleaf II & Yuba City Energy Center

Rule is Applicable	Rule is SIP Approved	Federally Enforceable	Rule No.	Rule Title	Title V/Federally Enforceable Notes
				adopted 10/01/2007	
●			5.0	General	
●			5.1	Hearing Board	
●			5.2	Procedures	
●			5.3	Hearings	
●			5.4	Contents of Petition for Hearing	
●			5.5	Request for Variances	
●			5.6	Appeal from Denial	
●			5.7	Failure to Comply with Rules	
●			5.8	Answers	
●			5.9	Dismissal of Request for a Hearing	
●			5.10	Place of Hearing	
●			5.11	Notice of Hearing	
●			5.12	Evidence	

FRAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR Calpine Greenleaf II & Yuba City Energy Center

Rule is Applicable	Rule is SIP Approved	Federally Enforceable	Rule No.	Rule Title	Title V/Federally Enforceable Notes
●			5.13	Preliminary Matters	
●			5.14	Official Notice	
●			5.15	Continuances	
●			5.16	Decision	
●			5.17	Effective Date of Decision	
●			5.18	Lack of Permit	
●			5.19	Record of Hearing	
●			6.0	General	
●			6.1	Interim Variances	
●			6.2	Limitation on Granting Variance	
●			6.3	Hearing Board May Impose Other Requirements	
●			6.4	Cash Bond	
●			6.5	Modifying or Revoking Variances	
●			6.6	Variance Time Period	

FRAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR Calpine Greenleaf II & Yuba City Energy Center

Rule is Applicable	Rule is SIP Approved	Federally Enforceable	Rule No.	Rule Title	Title V/Federally Enforceable Notes
●			6.7	Variance Action	
●			7.0	Fees, General	
●			7.1	Hearing Board Fees	
●			7.2	Analysis Fees	
●			7.3	Technical Report Fees	
●			7.4	Application Fees	
●			7.5	Notification of Operation Fees	
●			7.6	Annual Renewal Fees	
●			7.7	District Cost Determination	
			7.8	Open Burning Fees	
●			7.9	Air Toxic Hot Spot Fees	
			7.10	Indirect Source Fee	
●			7.11	Emission Reduction Credit (ERC) Banking Fee	
●			7.12	Transfer Fees	

FRAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR Calpine Greenleaf II & Yuba City Energy Center

Rule is Applicable	Rule is SIP Approved	Federally Enforceable	Rule No.	Rule Title	Title V/Federally Enforceable Notes
●			7.13	Late Payment	
			7.14	Registration Fees for Compression Ignition (CI) Engines Used in Agricultural Operations	
●			8.0	Penalties	
●			8.1	Arrest, Notice to Appear	
●			8.2	Orders for Abatement	
●			8.3	Administrative Civil Penalties	
●			9.0	Enforcement	
●	●	●	9.1	Emission Monitoring SIP approved 04/12/1982	There are no related conditions included in the permit because of the general nature of the rule.
●	●	●	9.2	Records and Reports SIP approved 04/12/1982	There are no related conditions included in the permit because of the general nature of the rule.
●	●	●	9.3	Tests SIP approved 04/12/1982	The related conditions are included in the permit.
●			9.4	Field Inspection	
●	●	●	9.5	Air Pollution Equipment - Scheduled Maintenance SIP approved 04/12/1982	There are no related conditions included in the permit because of the general nature of the rule.

FRAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR Calpine Greenleaf II & Yuba City Energy Center

Rule is Applicable	Rule is SIP Approved	Federally Enforceable	Rule No.	Rule Title	Title V/Federally Enforceable Notes
●	●	●	9.6	Equipment Breakdown SIP approved 04/12/1982	There are no related conditions included in the permit because of the general nature of the rule.
●			9.7	Permit	
●			9.8	Variance Action	
●			9.9	Notice to Comply	
●	*	●	10.1	New Source Review	The related conditions are included in the permit. (*Limited approval / Limited disapproval [76 FR 44809, 07-27-2011])
●			10.2	Emission Reduction Banking Credit	
●	*	●	10.3	Federal Operating Permits	*Although this is not a SIP approved rule, it is applicable because it is part of the approved FRAQMD Title V Permit Program.
			10.4	General Conformity	
			10.5	Transportation Conformity	
			10.6	New Source Performance Standards	
			10.7	Toxics New Source Review	

FRAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR Calpine Greenleaf II & Yuba City Energy Center

Rule is Applicable	Rule is SIP Approved	Federally Enforceable	Rule No.	Rule Title	Title V/Federally Enforceable Notes
			10.8	Federal Major Modifications	
			10.9	Rice Straw Emission Reduction Credits and Banking	
	●		10.10	Prevention of Significant Deterioration	Submitted to the EPA for SIP inclusion on 4/22/2013
●	*		10.11	Permitting Requirements for Stationary Sources Emitting Greenhouse Gases	*Although this is not a SIP approved rule, it will be applicable once it is approved to be a modification of the FRAQMD Title V Permit Program.
●	*	●	10.12	Acid Deposition Control	*Although this is not a SIP approved rule, it is applicable because it is part of the approved FRAQMD Title V Permit Program.
●			11.1	State Airborne Toxic Control Measures	
			11.2	Chrome Plating	
			11.4	Sterilizers and Aerators	