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Final Determination of Compliance

Sutter Energy Center

5029 South Township Road, Yuba City, CA 95993

Application: 13005H

Serving Sutter and Yuba Counties

Feather River Air Quality Management District

April 4, 2014

Reviewed by:

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Timothy Mitro, Air Quality Engineer — Date

Issued by:

4/4/2014

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I. INTRODUCTION

The Feather River Air Quality Management District (District) is issuing a Final Determination of Compliance (FDOC) for a modification to the Sutter Energy Center (SEC), an existing 578-megawatt (nominal) natural gas fired electric power generation facility. The facility currently consists of two combustion turbine generators, two heat recovery steam generators with duct burners, and a steam turbine generator. The facility is located approximately 7 miles southwest of Yuba City, California, along South Township Road and is surrounded by orchards and rice fields.

The modification consists of installing a 130 MMBTU/hr natural gas fired boiler, which would keep certain operating systems sufficiently warm, making it possible to reduce turbine startup times. In addition, SEC proposes to remove two parts of the CEC License Condition AQ-32, which currently limits the duration of the quarterly and annual startup/shutdown hours for the existing gas turbines to reflect the changes in operations resulting from the new equipment.

The FDOC sets forth the District's analysis as to how the new installation and turbine condition modification would comply with applicable air quality regulatory requirements, as well as the proposed permit conditions to ensure compliance with applicable federal, state, and District regulations. These regulations include the Best Available Control Technology (BACT) and emission offset requirements of the District New Source Review (NSR) requirements contained in District Regulation X, Rule 10.1. This document also includes air pollutant emission calculations, and a health risk assessment that estimates the impact of emissions of toxic air contaminants from the project on public health.

II. POWER PLANT PERMITTING PROCESS

The California Energy Commission (CEC) is the primary permitting authority for large power plants in California. The California Legislature has granted the Energy Commission exclusive licensing authority for all thermal power plants in California of 50 megawatts or more. The intent behind this system is to streamline the licensing process for power plants while, at the same time, providing a comprehensive review of potential impacts from the project.

This comprehensive environmental review is the equivalent of the review required for major projects under the California Environmental Quality Act (CEQA), and so the Energy Commission's license satisfies the requirements of CEQA. This CEQA-equivalent review encompasses air quality issues within the purview of the District, and also includes all other types of impacts, including water quality issues, endangered species issues, and land use issues.

The District collaborates with the Energy Commission regarding the air quality portion of its environmental analysis and prepares a "Determination of Compliance" that outlines whether and how the proposed project will comply with applicable air quality regulatory requirements. The Determination of Compliance is used by the Energy Commission to assess the air quality issues of the proposed modifications.

The District published its Preliminary Determination of Compliance (PDOC) on December 5, 2013. The public comment period for the PDOC was noticed in the Appeal Democrat on December 7, 2013 and the comment period ended on January 9, 2014. Comments were received from the EPA.

At this time, the District is publishing its Final Determination of Compliance for the project. The District has considered the comments received on the PDOC in determining whether to issue a Final Determination of Compliance and on what basis. All comments received during the comment period were considered by the District and addressed as necessary in the Final Determination of Compliance. The District's responses to the comments are included in this document.

In addition to the District's permitting process involving air quality issues, interested members of the public are also invited to participate in the Energy Commission's licensing proceeding, which addresses other environmental concerns, including those that are not related to air quality. For more information, please go to the following CEC website: http://www.energy.ca.gov/sitingcases/sutterpower/index.html.

III. PROJECT DESCRIPTION

The Sutter Energy Center (SEC) is currently operating under a District PTO/Title V permit issued on July 30, 2010. The existing 578 MW combined cycle facility uses two combustion turbine generators (CTG) exhausting into Heat Recovery Steam Generators (HRSG). Steam generated in the two HRSGs powers a steam turbine generator. Air pollutants are controlled using a dry-low NOx combustor, selective catalytic reduction (SCR), and oxidation catalyst technologies.

The addition of a natural gas fired auxiliary boiler will allow the plant to keep certain operating systems sufficiently warm, making it possible to reduce startup times. Steam from the auxiliary boiler will be used for steam seals, HRSG sparging, and hotwell heating. The auxiliary boiler will allow SEC to maintain condenser vacuum overnight or to pre-establish condenser vacuum prior to starting the combustion turbine. It will also allow SEC, when starting, to ramp up combustion turbine operation without holds by enabling turbine bypass valve operation immediately upon HRSG steam production. Additionally, the auxiliary boiler will provide a source of steam to start the fuel gas heater, and for high-pressure drum pre-warming on cold starts.

The new boiler is proposed to consist of the following:

- Manufacturer: Rentech (or equivalent)
- Nominal Heat Input: 130.33 MMBtu/hr
- Fuel: natural gas only
- Exhaust flow rate: approximately 38,502 actual cubic feet per minute (acfm)
- Exhaust temperature: approximately 300°F
- Stack height: 45 feet
- Stack diameter: 44 inches
- Nominal steam production: 100,000 lbs/hr

The permitted operating scenario for the new boiler is as follows:

- Operating hours per day – up to 24 hours per day and 8,760 hours per year
- Estimated number of startups and shutdowns – up to 2 per day and 730 per year

Despite being permitted for continuous 24/7 operations, the boiler is likely to run for many fewer hours than the permit would allow. The auxiliary boiler may operate during CTG startup periods.

In addition, SEC proposes to remove two parts of the CEC License Condition AQ-32, which currently limits the following:

- The maximum duration of startups per CTG shall be 400 hours per year and 102 hours per calendar quarter.
- The maximum duration of shutdowns per CTG shall be 300 hours per year, and 76 hours per calendar quarter.

In its place, SEC proposes that no limits on the number of startups/shutdowns on a quarterly and annual basis be placed in the Condition of Certification. SEC will monitor, with a continuous emissions monitoring system (CEMS), the quarterly and annual emissions during these events in order to demonstrate compliance with the existing daily, quarterly, and annual emission limits.

IV. FACILITY EMISSIONS

This section describes the existing permitted air emissions from the facility as well as the additional emissions from the proposed boiler.

The facility emissions are comprised from the two gas turbines and their associated duct burners. The existing units are permitted for the following emissions:

Table 1: SEC turbine generator and duct burner permitted annual emissions

Pollutant	January-March (lbs/quarter)	April-June (lbs/quarter)	July-September (lbs/quarter)	October-December (lbs/quarter)	Annual Emissions (tons/yr)
VOC	11,850	11,850	11,850	11,850	23.7
NOx	102,500	102,500	102,500	102,500	205.0
SOx	15,750	15,750	15,750	15,750	31.5
PM_{10} (a)	46,200	46,200	46,200	46,200	92.4
CO	241,600	241,600	241,600	241,600	483.2

(a): Assume PM = PM_{10} = $PM_{2.5}$

The auxiliary boiler will have the Potential To Emit (PTE) up to the following amounts of criteria pollutants, as set forth in the table below. These values represent the maximum emission concentrations and rates from the boiler during normal steady-state operations. Since the boiler will be coming online when needed, there will be an anticipated increase in NOx emissions during both the startup and shutdown procedures. These additional emissions are accounted for in the boiler's PTE and they will be limited by enforceable permit conditions.

Table 2: SEC auxiliary boiler emission limits and annual emissions

Pollutant	ppmv @ 3% O_2	lbs/hour	lbs/day (d)	tons/year
VOC	10	0.52	12.5	2.29
NOx (a)	5	0.73	17.5	-
NOx (b)	-	1.12	18.28	3.34
SOx	-	0.39	9.4	1.72
PM_{10} (c)	-	0.91	21.8	3.99
CO	50	4.82	115.7	21.12

(a): Steady state operations, excluding startups and shutdowns
(b): Worst case emissions, including startups and shutdowns
(c): Assume PM = PM_{10} = $PM_{2.5}$
(d): Calendar Day

V. REGULATION X REQUIREMENTS

A. BEST AVAILABLE CONTROL TECHNOLOGY

BACT is defined as the more stringent of:

a) The most effective control device or technique which has been successfully utilized for the type of equipment comprising such a source; or

b) The most stringent emission limitation achieved by an emission control device or technique for the type of equipment comprising such a source: or

c) Any emission control device or technique determined to be technologically feasible and cost effective by the APCO, or

d) The most effective emission control limitation for the type of equipment comprising such a source which the EPA states, prior to or during the public comment period, is contained in an approved implementation plan of any state, unless the applicant demonstrates to the satisfaction of the APCO that such limitations are not achievable. Under no circumstances shall the emission control required be less stringent than the emission control required by any applicable provision of federal, state or District laws, rules or regulations.

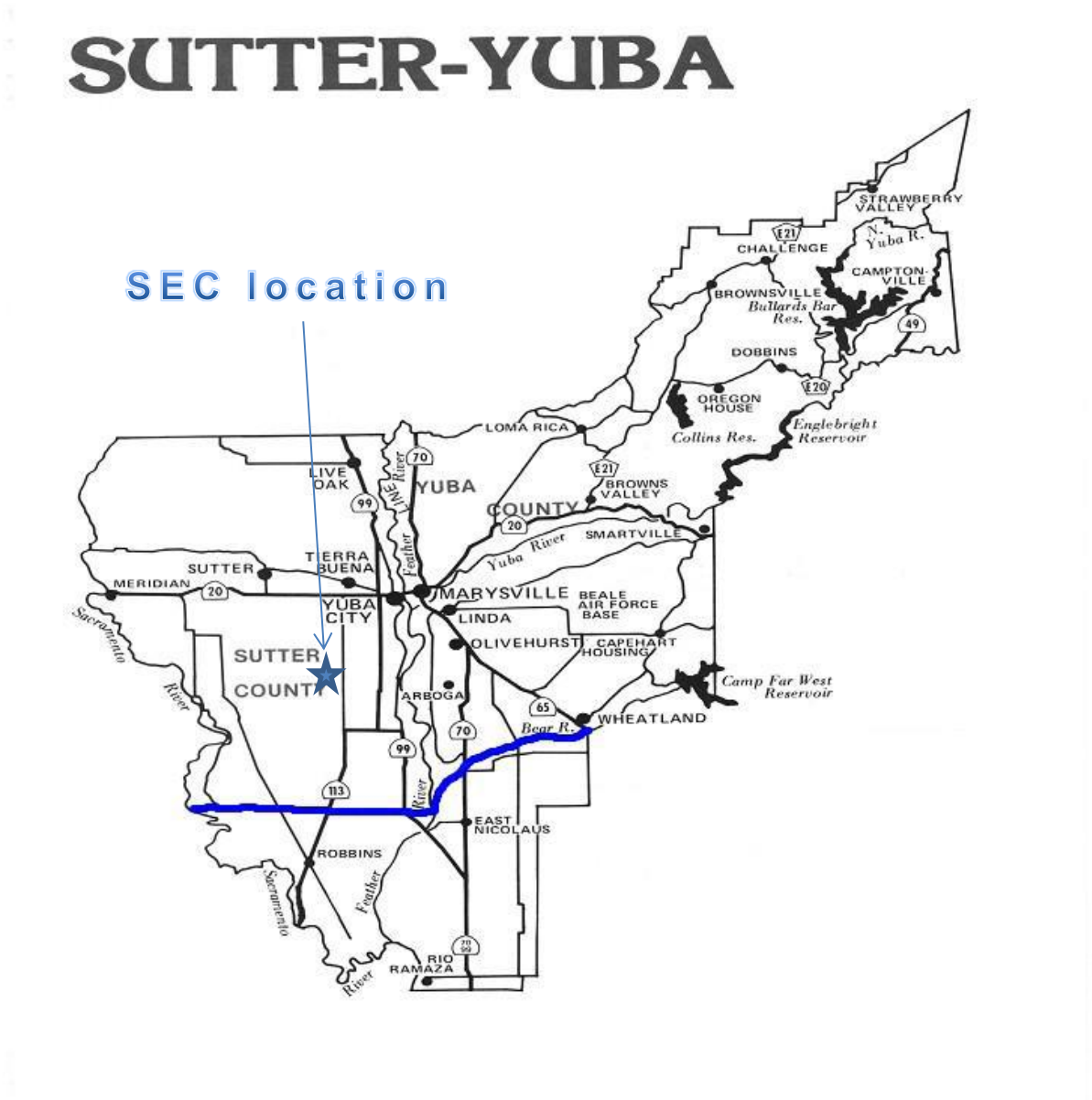
District Rule 10.1 requires an emission unit to use the Best Available Control Technology to control NOx, CO, VOC, PM_{10}, or SOx emissions if the emissions exceed the specified thresholds, as shown in the table below:

Table 3: BACT evaluation

Pollutant	Proposed Boiler Emissions (lbs/day)	North FRAQMD threshold (lbs/day)	South FRAQMD threshold (lbs/day) [for information only]
VOC	12.5	25	10
NOx	18.28	25	10
SOx	9.4	80	80
PM_{10}	21.8	80	80
CO	115.7	500	500

The District has multiple designations regarding attainment of the air quality standards set forth by the EPA. The southern portion of Sutter County has been designated as a severe nonattainment area for the federal 8-hour ozone standard. Due to this nonattainment status, the BACT thresholds are more stringent for new projects located in South FRAQMD. Please see “Figure 1” on the next page for more details on the boundary line split. The Sutter Energy Center is located in North FRAQMD, and so the boiler’s emissions will be compared to the North FRAQMD thresholds.

Figure 1: North-South FRAQMD Map



The proposed boiler is employing air pollution controls such as a Low NOx burner, flue gas recirculation, and Selective Catalytic Reduction (SCR) to minimize the emissions from the process. The PTE of the boiler, which includes these controls, are below the BACT threshold values for North FRAQMD. The permit will have enforceable conditions to make sure that the control equipment is being adequately maintained and that the BACT threshold values are not exceeded. Hence, the proposed boiler meets the District's BACT requirements.

B. OFFSETS

Annual facility emissions are used to determine whether the facility will need to offset any additional emissions with Emissions Reduction Credits (ERCs) under District Rule 10.1. This rule requires that new and modified facilities provide ERCs to offset the increases in permitted air emissions at the facility if the facility has a PTE of VOC, NOx, or PM_{10} emissions over 25 tons per year.

ERCs are generated when a company reduces their emissions beyond what is required by all District, State, and Federal regulations. This is usually done by either shutting down a permitted source, curtailing operations (such as limiting the acreage of rice burned), or adding air pollution control equipment. The company must then submit a banking application to the Air District to verify that the emission reduction is real, enforceable, quantifiable, and permanent. If the project meets all of these criteria, the District would issue an ERC certificate and add the document to the District's banking register. These ERCs can then be used to offset the increases from new or modified facilities, so that there will be no overall increase in emissions from facilities subject to this offset program.

However, when the facility was originally permitted in the late 1990s, the CEC required all non-attainment pollutants to be offset [Basis: CEC decision, section 8.1.4 - 12/8/1997]. This requirement is more stringent than District Rule 10.1 since the VOC emissions for the permitted turbines were less than 25 tons per year. The District will continue to uphold the CEC determination and require offsets for all VOC, NOx, and PM_{10} emissions from the boiler.

The table below summarizes the offset obligation for the proposed project:

Table 4: SEC auxiliary boiler offsets required

Pollutant	January-March (lbs/quarter)	April-June (lbs/quarter)	July-September (lbs/quarter)	October-December (lbs/quarter)	Annual Emissions (tons/yr)
VOC	1,129	1,142	1,154	1,154	2.29
NOx	1,647	1,665	1,684	1,684	3.34
PM_{10}	1,966	1,987	2,009	2,009	3.99

The applicant has proposed to use the following ERC certificates for the project:

Table 5: Proposed ERC certificates

Certificate #: EC-0009 Certificate Name: Spreckles District: Glenn County Location: 555 W 1st Street, Hamilton City					
Pollutant	January-March (tons/quarter)	April-June (tons/quarter)	July-September (tons/quarter)	October-December (tons/quarter)	Annual Emissions (tons/yr)
NOx	35.7	40.6	45.3	40.0	161.6
PM_{10}	0	16.0	24.0	16.0	56.0

Certificate #: EC-0004 Certificate Name: Spreckles District: Glenn County Location: 555 W 1st Street, Hamilton City					
Pollutant	January-March (tons/quarter)	April-June (tons/quarter)	July-September (tons/quarter)	October-December (tons/quarter)	Annual Emissions (tons/yr)
PM_{10}	10.0	0	12.7	4.7	27.4

Certificate #: 94-1-01R Certificate Name: Rosboro Lumber District: FRAQMD Location: 6124 Avondale Ave, Marysville					
Pollutant	January-March (tons/quarter)	April-June (tons/quarter)	July-September (tons/quarter)	October-December (tons/quarter)	Annual Emissions (tons/yr)
VOC	4.17	5.28	4.32	4.71	18.49

Two of the banking certificates listed above were issued by the Glenn County Air Pollution Control District. Calpine has produced evidence indicating that it has an enforceable right to these ERCs located in Glenn County. These ERCs cannot be used until the provisions of California Health & Safety Code §40709.6 are met and the District enters into a Memorandum of Understanding (MOU) with Glenn County. The District intends to satisfy these requirements as soon as practicable after the CEC completes an environmental analysis document and the criteria in Section 15253, Subdivision (b) of the CEQA Guidelines are met. The ERCs will then need to be submitted to the District prior to the initial operation of the new boiler.

District Rule 10.1 requires the ERCs to be reduced in value based on the distance between the location of where the offsets were generated and the location of where the offsets are to be applied. For example, the Distance between 6124 Avondale Ave in Marysville [ERC #94-1-01R] and the Sutter Energy Center is approximately 8.5 miles. Hence, these ERCs would be applied at a ratio of 1.2 tons of credits per 1 ton of emissions reduced due to the distance between these two facilities. The proposed certificates still have enough credits to account for the offset ratios.

After the certificates are used, the District will notify Glenn County so that the ERC certificates can be reissued at their new, reduced value.

C. TITLE V PERMIT

Title V of the 1990 federal Clean Air Act Amendments required the EPA to establish a national, federally enforceable operating permit program. Accordingly, the EPA promulgated Title 40 of the Code of Federal Regulations, Part 70, which requires each state or local permitting authority to develop and submit a federally enforceable facility operating permit program for EPA approval.

Title V is intended to further facilitate and enhance air quality planning, emission controls, and compliance, and to improve existing emission inventories. In addition to the existing regulations, Title V provides for:

- EPA veto authority over permit issuance,
- greater opportunity for federal and citizen enforcement,
- enhanced public participation during the permit issuance process,
- clearer determination of applicable requirements; and
- improved enforceability of applicable requirements.

The District adopted Rule 10.3 - Federal Operating Permit Program to meet the requirements of Part 70 and to interface the Title V permitting effort with the District's permit program.

The Sutter Energy Center is currently operating under FRAQMD Permit to Operate P13005, as issued on July 30, 2010 for its existing gas turbines. An administrative modification was performed for the permit and it was reissued on February 12, 2014. The permit is still set to expire on July 30, 2015. Calpine is required to submit a new application to renew the Title V prior to January 30, 2015.

To renew the permit, the District is required to conduct a public notice to allow for sufficient time for the public to comment on the District's proposed decision. The District will arrange for the renewal public notice to take place after the new boiler is installed, operating, and inspected by District staff. The District will then issue a new Title V permit with both the existing turbines and the new boiler. This new Title V permit will be valid for 5 years from the date of issuance.

D. TOXICS NEW SOURCE REVIEW

Hazardous air pollutants (HAPs) are pollutants that are listed in Section 112(b) of the Federal Clean Air Act. Not all of the pollutants that are designated as Toxic Air Contaminants (TACs) by the state of California are considered HAPs by the Federal

EPA. Three notable pollutants that are TACs and not HAPs are ammonia, hydrogen sulfide, and sulfuric acid mist.

The purpose for summing the hazardous air pollutants is to determine whether a facility is major for hazardous air pollutants. The facility would be major if the facility emits more than 10 tons/year of any single HAP or more than 25 tons/year of a combination of HAPs. If the facility is major for HAPs, District Rule 10.7 would require the facility to employ T-BACT, which is the best available control technology for toxics.

The table below summarizes the HAP emissions for the Sutter Energy Center:

Table 6: Sutter Energy Center HAP emissions

Pollutant	Proposed Boiler PTE (tons/year)	Existing Turbine PTE (tons/year)	Combined Facility Wide PTE (tons/year)	Major Source threshold (tons/year)
Single HAP	0.02	1.19	1.21	10
Combined HAPs	0.06	1.72	1.78	25

Since the facility emissions are below the major source threshold for HAPs, T-BACT is not required.

E. PREVENTION OF SIGNIFICANT DETERIORATION

Prevention of Significant Deterioration (PSD) is a federal permitting program for new major stationary facilities and modifications to existing major facilities located in areas classified as attainment or in areas that are unclassifiable for any criteria air pollutant.

A PSD permit is a pre-construction permit that is currently administered by EPA Region IX for both Sutter and Yuba Counties. However, EPA has been encouraging local air districts to take on PSD permitting responsibility for projects that occur within their jurisdiction. For an air district to take on PSD permitting, the district needed to adopt a PSD permitting rule that mirrors the federal requirements and have that rule approved by the Air Resources Board (ARB) and EPA for incorporation into the State Implementation Plan (SIP).

In August 2011, the District adopted Rule 10.10 – Prevention of Significant Deterioration, and the District submitted this rule to both the ARB and the EPA for inclusion into the SIP. To date, this rule submittal has not been acted upon by the EPA. Hence, the EPA is still required to administer the PSD program until such time as it acts on the District's submittal.

The Sutter Energy Center was originally issued a PSD permit prior to constructing their gas turbines in 1999 [SAC 98-01]. Calpine petitioned for and received an amended PSD

permit in 2004 for some minor changes to the turbine's operating conditions. The addition of this boiler does not trigger any PSD significant thresholds. However, according to 40 CFR Part 52.21, the facility will be required to submit a minor modification to their existing PSD permit to allow for the installation of the boiler. The District has verified that Calpine has submitted the necessary applications to EPA Region IX. Once EPA acts on the PSD modification, the District can incorporate any relevant permit conditions into the final Title V permit.

F. PERMITTING REQUIREMENTS FOR GREENHOUSE GASES

In addition to the criteria air pollutants, natural gas combustion produces air emissions known as greenhouse gases (GHGs). GHGs are known to contribute to the warming of the earth's atmosphere. These include primarily carbon dioxide, nitrous oxide (N_2O, not NOx, which is commonly known as oxides of nitrogen), and methane.

On July 1, 2011, greenhouse gases became subject to regulation if a facility has the potential to emit more than 100,000 tons per year of carbon dioxide equivalents, as defined in the regulation. The existing turbines at Sutter Energy Center have a potential to emit of approximately 2.1 million tons of CO_2e, but the turbines were built prior to the GHG regulation being applicable.

Modifications at existing facilities that increase GHG emissions by at least 75,000 tons per year are subject to PSD permitting requirements. The proposed boiler is anticipated to emit approximately 67,000 tons per year of GHG emissions at its maximum capacity, as based on emission factors found in AP-42 Section 1.4 [July 1998]. Since the boiler cannot exceed the 75,000 tons per year threshold, the boiler does not need to obtain a PSD permit for GHGs.

In August 2011, the District adopted Rule 10.11 – Permitting Requirements for Stationary Sources Emitting Greenhouse Gases. The District also submitted this rule to both the ARB and the EPA for inclusion into the SIP. To date, this rule submittal has not been acted upon by the EPA. Hence, the GHG requirements are not, at this time, federally enforceable by the District. The facility will still be required to report GHG emissions to CARB, the District, and the EPA in accordance with 40 CFR Part 98.

G. ACID RAIN PERMIT

The Acid Rain Program (Title IV), which was codified in 1990, introduced an allowance trading system that harnesses the incentives of the free market to reduce SOx emissions. Affected utility units are required to use allowances for each ton of SOx emissions produced in a given year. Those utility units that could reduce emissions in a cost-effective manner could sell off their additional, unused allowances to facilities that may have a tougher time reducing their emissions. However, regardless of the number

of allowances a source holds, it may not emit at levels that would violate federal, state, or local limits set to protect public health.

The District adopted Rule 10.12 – Acid Deposition Control, so that the District could enforce the Acid Rain Program as part of the Title V operating permit. The requirements of the Acid Rain Program are outlined in 40 CFR Part 72, which establishes the general provisions and operating permit program requirements for affected sources, such as fossil fuel fired utility units.

The facility has an existing acid rain permit due to the existing turbines. However, the boiler is not an affected unit and does not need to be added to the acid rain permit because the boiler does not serve an electrical generator with nameplate capacity of 25 MW or greater.

VI. OTHER APPLICABLE RULES

A. REGULATION III, RULE 3.21 - INDUSTRIAL, INSTITUTIONAL, COMMERCIAL BOILERS, STEAM GENERATORS, AND PROCESS HEATERS

(adopted 6/5/2006)

District Rule 3.21 sets emission limits and monitoring requirements for all boilers, steam generators, and process heaters with a maximum heat input greater than 1 MMBTU/hr. Pursuant to Rule 3.21, the auxiliary boiler shall not exceed 70 ppmv NOx, 400 ppmv CO, or 20 ppmv ammonia slip, all adjusted to 3% O_2. As shown in previous sections, the proposed emission limits for this boiler are well below the criteria pollutant limits and the ammonia slip will be limited to 5 ppmv.

Rule 3.21 will also require the boiler to be source tested, per EPA methods, once every 8,760 hours of operation, or once every two calendar years; whichever occurs more frequently. To track the boiler's operations, it will be required to have either a non-resettable hour meter or a totalizing fuel flow meter.

B. NSPS - 40 CFR 60 SUBPART DB - INDUSTRIAL/COMMERCIAL/INSTITUTIONAL STEAM GENERATING UNITS

(amended 6/13/2007)

This federal regulation is primarily applicable to steam generating units, such as boilers, with a maximum rated capacity between 100-250 MMBTU/hr and were constructed after June 19, 1984 at a major stationary source. Such boilers will have to meet certain emission limits for NOx and SOx, and have monitoring and recordkeeping requirements to demonstrate compliance. This regulation is applicable to the proposed auxiliary boiler.

The proposed emission limits for this auxiliary boiler are well below the NOx and SOx standards, as listed in 40 CFR §60.42b(k)(1) and §60.44b(a). As for the monitoring requirements, Calpine has opted to install a Continuous Emission Monitoring System (CEMS) for NOx, CO, and O_2, which will meet the requirements of §60.48b(b).

C. 40 CFR PART 64, COMPLIANCE ASSURANCE MONITORING (CAM)

Requirements for enhanced monitoring may apply to emission units that are required to obtain Part 70 (Title V) permits. If applicable, the requirements would apply at the time of issuance of the Title V permit. Although these requirements would not apply at the completion of construction, it is prudent to determine at this time if they will apply so that it can be determined whether the proposed monitoring strategy would comply with CAM.

In general, the requirement applies if an emission unit has uncontrolled emissions of any pollutant greater than the major source thresholds (100 tpy of any regulated air pollutant or 10 tpy of a HAP) and the emissions of that pollutant are abated by a control device. The uncontrolled emissions of the boiler were calculated using emission factors

found in AP-42, Section 1.4 [July 1998]. The uncontrolled emissions are documented in the table below:

Table 7: Uncontrolled Boiler Emissions

Pollutant	Emission Factor (lb/MMscf)	Calculation Assumptions	Annual Uncontrolled Emissions (tons/yr)
VOC	5.5	Natural Gas HHV = 1,020 BTU/scf;	3.08
NOx	100	Boiler input = 130.33 MMBTU/hr;	55.97
SOx	0.6		0.34
PM_{10} / $PM_{2.5}$	7.6	Operation = 8,760 hours/year;	4.25
CO	84		47.01

Because the uncontrolled emissions for the boiler will be less than 100 tons/year for each pollutant, the boiler is not subject to the requirements of 40 CFR 64.

D. PUBLIC NUISANCE (CALIFORNIA H&SC §41700)

None of the project's sources of air contaminants are expected to cause injury, detriment, nuisance, or annoyance to any considerable number of persons or the public with respect to any impacts resulting from the emission of air contaminants regulated by the District.

E. PUBLIC NOTICE, SCHOOLS (CALIFORNIA H&SC §42301.6)

The facility is not within 1,000 feet of a school; and therefore, is not subject to public notice requirements for schools.

F. AUTHORITY TO CONSTRUCT/PERMIT TO OPERATE

The applicant has submitted an application to the District to obtain an Authority to Construct and Permit to Operate for the proposed auxiliary boiler. The permits will be issued after the CEC completes its licensing process.

VII. HEALTH RISK SCREENING ANALYSIS

Toxic Air Contaminants (TACs) are a subset of air pollutants that can be harmful to health and the environment even in small amounts. Pursuant to AB2588, a health risk screening must be conducted to determine the potential impact on public health resulting from the worst-case emissions of TACs from the proposed boiler.

When combusting natural gas, a variety of TAC emissions may be produced, but the majority are emitted in such small amounts that they have no effect on the overall health risk analysis. The top three TACs from natural gas combustion, which are the driving factors for the health risk analysis, and the potential unreacted ammonia from the SCR system are summarized in the table below:

Table 8: Toxic Air Contaminants from the Proposed Boiler

Pollutant	Max Emissions (lbs/hour)	Max Emissions (lbs/year)
Benzene	2.68E-04	2.35
Formaldehyde	9.58E-03	83.9
Toluene	4.34E-04	3.81
Ammonia	0.53	4,640

When performing a health risk analysis, the three main values that are calculated are the cancer risk, the chronic hazard index, and the acute hazard index.

The cancer risk is the probability of contracting cancer over a 70 year lifetime. District guidelines consider projects with a risk of less than 1 in a million to be considered a “low risk” and projects with a risk between 1 to 10 in a million to be an “intermediate risk.” Any project with a calculated risk of over 10 in a million is considered a “significant risk” to the public.

The chronic hazard index measures the non-cancer, adverse health effects from prolonged chemical exposure. The acute hazard index measures the adverse health effects caused by a brief chemical exposure over a short period of time, generally ranging from a 1 to 8 hour period. If either of the hazard indices are calculated to be less than 0.1, then the project is considered a low risk.

The District performed its own calculations in accordance with the requirements of the California Office of Health Hazard Assessment (OEHHA) guidelines. The District performed the calculations for the maximum exposed individual, which is located approximately 0.5 miles northeast of the exhaust stack of the boiler. The impacts of the boiler’s TACs were assessed utilizing SCREEN 3, an EPA approved air pollutant dispersion model.

The health risk analyses for the existing turbines and the proposed boiler are listed in the table below:

Table 9: Health Risk Assessment Data

Pollutant	1999 Applicant calculated risk for the existing turbines	District calculated values for boiler at closest receptor
Cancer Risk	0.02E-06	0.0092E-6
Cancer Burden	-	-
Acute HI	0.01	0.0006
Chronic HI	0.02	0.0005

Please note that the District calculated values for the boiler does not include acrolein, which substantially increases the cancer risk. Currently, the California Air Resources Board (CARB) California Air Toxics Emission Factor (CATEF) database and EPA's AP-42 does not list an acrolein emission factor for natural gas combustion for boilers. Since there are no certified emission factors for acrolein, the District did not include it in the screening assessment.

The District calculated chronic hazard index and the acute hazard index were both found to be less than 0.1, showing that the boiler will be a low risk for non-cancer health effects. The District calculated cancer risk was found to be 0.009 in one million for the maximally exposed resident near the facility. Since this value is less than one in a million, the boiler is considered a low risk for cancer health effects.

VIII. REVIEW OF CEC CONDITION AQ-32

In addition to the application to install the auxiliary boiler, SEC proposes to remove two parts of the CEC License Condition AQ-32, which currently limits the existing CTGs to the following:

- The maximum duration of startups per CTG shall be 400 hours per year and 102 hours per calendar quarter.
- The maximum duration of shutdowns per CTG shall be 300 hours per year, and 76 hours per calendar quarter.

To further describe the emissions profile during startup and shutdowns, the existing permit limits for the each turbine is as follows:

Table 10: SEC turbine generator and duct burner emissions

Pollutant	In all modes of operation, except startup and shutdown (lbs/hour)	Startup (lbs/hour)	Startup (lbs/startup)	Shutdown (lbs/shutdown)
VOC	3.51	16	59	16
NOx	19.1	175	680	80
SOx	4.02	3.7	22.2	3.7
PM_{10} / $PM_{2.5}$	11.5	9	54	9
CO	34.3	902	2,514	100

SEC has requested to maintain the existing permitted emission limits per startup and shutdown. SEC has also requested to maintain the permitted hourly, daily, quarterly, and annual mass emission limits and concentration emission limits as they currently exist in P13005.

Hence, despite the potential to perform more startups and shutdowns per quarter or per year, there will be no permitted increase in turbine emissions. When the turbines were initially permitted, the worst case emissions were modeled and found to be acceptable. Since there is no increase in emissions, the District has no issues with removing the previously mentioned portion of CEC condition AQ-32.

IX. PUBLIC COMMENTS FROM PDOC

The District has received comments regarding the District's Preliminary Determination of Compliance (PDOC) for the proposed Sutter Energy Center modifications. The District has considered all comments that were submitted, and has made a final determination that the proposed project meets all applicable District Regulations as well as applicable State and Federal regulatory requirements. The public comments received on the PDOC are addressed below. The District appreciates the public's interest and values the public's input into this permitting process.

Comment #1 - EPA: Facility emissions, Particulates: Please include emission estimates of PM and PM2.5. FRAQMD indicated it has assumed that PM = PM10 = PM2.5; please cite this in Section IV of the analysis. Therefore, where applicable, these pollutants should be referenced in the proposed permit requirements.

Response #1: Comment noted and incorporated into Section IV and the Proposed Permit Conditions.

Comment #2 - EPA: Source test method specificity: While we understand this was an unintended oversight, FRAQMD has indicated the specific NOx and CO source test methods will be included in the proposed permit "Emission Testing Requirements" subsection.

Response #2: Comment noted. The appropriate condition (#23) was added into the Proposed Permit Conditions to address this issue.

Comment #3 - EPA: NSPS, Subpart A and Db: We note that NSPS-related submittals (*e.g.*, notifications, plans, reports, etc.) are required to be submitted to the FRAQMD Air Pollution Control District; however, U.S. EPA also should be referenced. Therefore, please include a reference to *the Administrator*, which represents U.S. EPA. We are available to discuss this request in more detail.

Response #3: Comment noted. The appropriate conditions were added into the Proposed Permit Conditions.

Comment #4 - EPA: Natural gas: We suggest specifying that the natural gas supply is pipeline quality natural gas (e.g., PUC-quality).

Response #4: Comment noted and incorporated into the Proposed Permit Conditions.

X. PROPOSED PERMIT CONDITIONS

The District is proposing the following permit conditions to ensure that the project complies with all applicable District, state, and federal Regulations. The proposed conditions would limit operational parameters such as fuel use, stack gas emission concentrations, and mass emission rates. The permit conditions specify abatement device operation and performance levels. To aid enforcement efforts, conditions specifying emission monitoring, source testing, and recordkeeping requirements are included.

To provide maximum operational flexibility, no limitations are being proposed on the type or quantity of boiler startups or shutdowns. Instead, the facility would be required to comply with the daily, quarterly, and annual (calendar year) mass emission limits at all times. Compliance with the CO and NOx limitations would be verified by continuous emission monitors (CEMs) that will be in operation during all operating modes, including startup and shutdown. Compliance with the VOC, SOx, and PM_{10} mass emission limits will be verified through source testing.

Proposed Sutter Energy Center Auxiliary Boiler and Abatement Devices

One (1) RENTECH Boiler (or equivalent), nominal rated at 130.33 MMBtu/hr [Natural gas-fired, Low NOx burner, Flue Gas Recirculation]; with NOx emissions abated by a Selective Catalytic Reduction system [Anhydrous Ammonia]

Proposed Sutter Energy Center Permit Conditions:

Facility-Wide: Initial Operations & Commissioning Period

1. The owner/operator shall submit a plan to the District Engineering Division at least two weeks prior to first firing of the boiler that describes the procedures to be followed during the commissioning period. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but not be limited to, the tuning of the burner, the installation and operation of the required emission control systems, the installation, calibration, and testing of the CO and NOx continuous emission monitors, and any activities requiring the firing of the boiler without abatement by the SCR system.
2. Prior to the first firing of the boiler, the owner/operator shall submit to the District valid ERC certificates to offset the following quarterly increases in facility emissions:

Pollutant	January-March (lbs/quarter)	April-June (lbs/quarter)	July-September (lbs/quarter)	October-December (lbs/quarter)	Annual Emissions (tons/yr)
VOC	1,129	1,142	1,154	1,154	2.29
NOx (as NO_2)	1,647	1,665	1,684	1,684	3.34
PM_{10}	1,966	1,987	2,009	2,009	3.99

3. The owner/operator shall notify the District of the date of first firing of the boiler by calling the District Engineering Department at (530) 634-7659. The owner/operator shall also notify the Administrator of the date of initial start-up in accordance with 40 CFR §60.7
4. After the first firing of the boiler, the owner/operator shall have a 180-day commissioning period to conduct tests and perform other necessary initial adjustments on the equipment. During this time, these conditions shall function as a temporary Permit to Operate. Any operation of the equipment beyond this period without receipt of a final Permit to Operate or prior District approval for an extension will be considered operation without a permit and may be subject to enforcement action. [District Rule 4.1]
5. Operating Conditions #12-14 do not apply during the commissioning period. The owner/operator shall still minimize emissions from the boiler to the maximum extent possible during the commissioning period.
6. Prior to issuance of a final Permit to Operate, the owner/operator shall conduct an emissions source test to demonstrate that the boiler will be in compliance with the emission limitations specified in Condition #13. The source test shall determine the VOC, NOx, SOx, PM_{10}, CO, and ammonia (NH_3) emissions during steady state operations.
7. The owner/operator shall submit a Source Test Protocol to both the District and the Administrator for review and approval at least thirty (30) days prior to the source test. The facility shall again notify the District within five (5) days prior to actual date and time of the source test. All tests performed shall conform to U.S. EPA or CARB methodology and procedures.
8. The results from the source test shall be submitted to both the District and the Administrator within forty-five (45) days after testing to show compliance with the requirements of this FDOC.

Equipment Specific Conditions

9. The boiler may operate 24 hours per day and 8,760 hours per calendar year.
10. The boiler shall exclusively use pipeline quality natural gas as a fuel.
11. The boiler shall be equipped with either a non-resettable hour meter to record the cumulative total hours of operation or a totalizing fuel flow meter to record the cumulative total of natural gas combusted.
12. All emission control equipment shall be operated and maintained per manufacturer specifications to effectively abate and minimize the air emissions.
13. The boiler shall not exceed the following emission limits or concentrations:

Pollutant	**Maximum Allowable Emissions:** (c)		
	ppmvd at 3% O_2	lbs/hr	lbs/day (d)
VOC	10	0.52	12.5
NOx (as NO_2) (a)	5	0.73	17.5
NOx (as NO_2) (b)	-	1.12	18.28
SOx (as SO_2)	-	0.39	9.4

Pollutant	Maximum Allowable Emissions: (c)		
	ppmvd at 3% O_2	lbs/hr	lbs/day (d)
PM_{10} / $PM_{2.5}$	-	0.91	21.8
CO	50	4.82	115.7
NH_3	5	-	-

(a) Steady state operations, excluding startups and shutdowns
(b) Worst case emissions, including startups and shutdowns
(c) All emissions are calculated on a dry basis. All emission limits shall be measured on a 3-hour average (an average of three 1-hour tests for the purpose of source testing and a 3-hour rolling average for a continuous emission monitoring (CEM) system).
(d) Calendar day

14. The boiler shall not exceed the following quarterly or annual emission limits:

Pollutant	Maximum Allowable Emissions:				
	January-March (lbs/quarter)	April-June (lbs/quarter)	July-September (lbs/quarter)	October-December (lbs/quarter)	Annual (tons/year)
VOC	1,129	1,142	1,154	1,154	2.29
NOx (as NO_2) (a)	1,647	1,665	1,684	1,684	3.34
SOx (as SO_2)	848	858	867	867	1.72
PM_{10} / $PM_{2.5}$	1,966	1,987	2,009	2,009	3.99
CO	10,415	10,531	10,647	10,647	21.12

(a) Worst case emissions, including startups and shutdowns

15. Startups are defined as the lesser of the following:

    a. The first 60 minutes of continuous fuel flow to the boiler after fuel flow is initiated, or

    b. The period of time from boiler fuel flow initiation until the boiler achieves two consecutive CEM data points in compliance with the emission concentration limits for CO and NOx.

16. Shutdowns are defined as the lesser of the following:

    a. The first 30 minute period immediately prior to the termination of fuel flow to the boiler, or

    b. The period of time from non-compliance with any requirement for CO or NOx until termination of fuel flow to the boiler.

Monitoring Conditions

17. The permittee shall install, maintain, and operate the following continuous emissions monitoring (CEM) systems in the exhaust stack of the boiler:

a. A CEM system to measure stack gas NOx concentrations. The system shall meet EPA monitoring performance specifications (40 CFR 60.13 and 40 CFR Part 60 Appendix B, Performance Specification 2);

b. A CEM system to measure stack gas O_2 concentrations. The system shall meet EPA monitoring performance specifications (40 CFR Part 60 Appendix B, Performance Specification 3); and

c. A CEM system to measure stack gas CO concentrations. The system shall meet EPA monitoring performance specifications (40 CFR Part 60 Appendix B, Performance Specification 4).

18. A quality assurance/quality control (QA/QC) program for the CEM system shall be developed and maintained. At a minimum, the plan shall conform to 40 CFR Part 60 Appendix F.

19. A Relative Accuracy Test Audit (RATA) shall be conducted at least once every four calendar quarters.

a. The RATA for the NOx monitor shall be conducted in accordance with 40 CFR Part 60 Appendix B, Performance Specification 2, Section 7.

b. The RATA for the O_2 monitor shall be conducted in accordance with 40 CFR Part 60 Appendix B, Performance Specification 3, Section 3.

c. The RATA for the CO monitor shall be conducted in accordance with 40 CFR Part 60 Appendix B, Performance Specification 4, Section 3.

20. A Cylinder Gas Audit (CGA) shall be conducted every calendar quarter except during a quarter in which a RATA is performed. The CGA shall be conducted in accordance with 40 CFR Part 60 Appendix F.

21. All non-zero concentration audit gases shall have been certified by comparison to National Bureau of Standards (NBS) Standard Reference Materials, NBS/EPA Certified Reference Materials or EPA Protocol Gases.

a. Documentation shall be made available to the FRAQMD upon request containing gas calibration standard information, including an identification number corresponding to the gas cylinder number, gas mixture constituents and concentrations, and gas cylinder fill and expiration dates.

b. If a gas cylinder expiration date is not provided by the gas vendor, a two (2) year expiration date from the cylinder fill date shall apply.

c. Gas cylinders in use beyond the expiration date will be considered a violation of this permit.

Emission Testing Requirements

22. The facility shall perform a NOx and CO source test of the boiler once every 8,760 hours of operation, or once every two calendar years; whichever occurs more frequently.

23. Each source test shall be conducted using the following methods:

a. NOx - EPA Method 7E or CARB Method 100,

b. CO - EPA Method 10 or CARB Method 100,

c. Stack Gas Oxygen - EPA Method 3A or CARB Method 100.

24. Upon request and written notification from the APCO, the permittee shall perform a VOC, SOx, PM_{10}, and NH_3 source test of the boiler to verify compliance with Condition #13.

25. During each source test, the boiler shall be operated at the maximum firing capacity, defined as ≥ 90% of the heat input capacity achievable at the time of the source test, based on the current ambient and process conditions.

Recordkeeping and Reporting Conditions

26. The following records shall be continuously maintained on site for at least five years from the date the record was created and shall be made available to the APCO upon request.

a. Monthly and Annual natural gas fuel consumption or hours of operation of the boiler.

b. NOx and CO emission concentrations from the boiler. (ppmvd at 3% O_2, 3-hour rolling average)

c. NOx and CO hourly mass emissions from the boiler, as measured by the CEMS. (lbs/hour)

d. NOx and CO quarterly mass emissions from the boiler. (lbs/quarter)

e. NOx and CO yearly mass emissions from the boiler. (lbs/calendar year)

f. Ammonia injection rate to the SCR system. (scf/hour)

g. The occurrence and duration of any:

i. Startup, shutdown, or malfunction in operation of the boiler.

ii. Malfunction of the air pollution control equipment.

iii. Periods during which a continuous monitoring system or monitoring device is inoperative.

iv. Corrective actions taken.

h. Measurements of each CEMS, recorded in a permanent form, including:

i. Monitoring device and performance testing measurements.

ii. CEMS performance evaluations.

iii. CEMS or monitoring device calibration checks.

iv. CEMS adjustments and maintenance.

i. Date and results of each source test performed.

27. For each calendar quarter, the facility shall submit to the APCO a written report within 30 days of the end of the reporting period. Each report shall contain the following information:

a. Quarterly natural gas fuel consumption or hours of operation of the boiler.

b. Quarterly NOx and CO mass emissions from the boiler.

c. Whenever an emission occurs as measured by the required CEMS that is in excess of any emission limitation:

i. The magnitude of excess emissions

ii. The date, time, and duration of each period of excess emissions.

iii. The periods of excess emissions due to any upset, breakdown, or malfunction shall be specifically identified.

iv. The nature and cause of any malfunction, if known, or the best possible cause of any malfunction if not specifically known.

v. The corrective action taken or preventive measures adopted.

28. For each calendar year, the facility shall submit to the APCO a written report within 30 days of the end of the reporting period. Each report shall contain the following information:

    a. Annual natural gas fuel consumption or hours of operation of the boiler.

    b. Annual NOx and CO mass emissions from the boiler.

General Operating Conditions

29. Acceptance of this permit is deemed acceptance of all conditions as specified. Failure to comply with any condition of this permit or the Rules and Regulations of the Feather River AQMD shall be grounds for revocation of this permit. [District Rules 4.0 and 4.5]

30. This permit shall be maintained by the facility and be readily available at all times on the operating premises. Operating staff of this facility shall be advised of and be familiar with all the conditions contained in this permit. [District Rule 4.14]

31. If any provision of this permit is found to be invalid, such finding shall not affect the remaining provisions of this permit. [District Rule 1.2]

32. Any additions, deletions, or alterations of the subject equipment, including a change in the method of operation or a change in the location, shall be reported to the District. Such alterations may require a new Authority to Construct Permit. [District Rule 4.1]

33. The District reserves the right to amend this permit, if the need arises, in order to ensure the compliance of this facility and/or to abate any public nuisance. [CH&S §42301(e)]

34. The physical integrity of all processes and air pollution control equipment shall be maintained at regular intervals to ensure minimal discharge of emissions. If applicable, each process shall not be conducted without its associated control equipment operating as designed. All manufacturer recommendations shall be followed diligently. [District Rule 4.5]

35. This facility shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. [CH&S §41700]

36. Emissions from any one source, including stacks or cyclones, shall not exceed forty (40) percent opacity for any period or periods aggregating three (3) minutes in any one (1) hour period. [District Rule 3.0, CH&S §41701]

37. If any equipment failure or breakdown occurs which causes or may cause excess emissions, the District must be notified within one (1) hour. [District Rule 9.6]

38. Emission source tests on any source may be required at the discretion of the Air Pollution Control Officer. All tests shall be made and the results calculated in accordance with test procedures approved by the Air Pollution Control Officer. [District Rule 9.3]

39. Each permitted source of air pollution shall be inspected or tested at such intervals of time so that no extended periods of violations will occur. The "Right of Entry," as delineated by the California Health and Safety Code: Section 41510, shall apply at all times. [District Rule 9.4]

40. This permit is not transferable from either one location to another, from one piece of equipment to another, or from one person to another without prior District approval. In the event the control of this facility is assumed by a new owner, the District shall be notified in writing within ten (10) days of the change of ownership. [District Rule 4.15]

41. This permit shall be valid for the time period indicated on the permit and may be renewed annually thereafter. Annual renewal fees shall be assessed pursuant to California Health and Safety Code: Section 42311. The person to whom this permit is issued shall be responsible for the payment of annual fees. If the payment of fees is not received within 60 days of the due date, the fee shall be increased by 50%. In the event of facility closure, the owner shall be responsible for any outstanding and/or current fees. [District Rule 7.13]

42. The facility shall submit to the District, on an annual basis or upon request by the District, any records necessary for compiling the district emission inventory. The report shall identify each process and its actual emissions as required by the recordkeeping conditions on the Permit to Operate. [District Rule 9.2, CH&S §40701]

43. Any person who violates any provisions of this part or any order, rule or regulation of the District adopted pursuant to these Rules and Regulations is guilty of a misdemeanor. Every day during any portion of which such violation occurs constitutes a separate offense. [District Rule 8.0]

44. The facility shall not cause or allow fugitive dust emissions from any source to be airborne beyond the facility property lines. [District Rule 3.16]

XI. FINAL DETERMINATION

The District has made a final determination that the proposed modifications to the Sutter Energy Center complies with all applicable District, state and federal air quality rules and regulations as long as the facility complies with the aforementioned permit conditions and offset requirements. This document will be forwarded to the California Energy Commission for inclusion into their licensing process.