

**Bay Area Air Quality Management District**

375 Beale Street, Suite 600  
San Francisco, CA 94105  
(415) 749-5000

**Proposed  
Permit Evaluation  
and  
Statement of Basis**

**Significant and Minor Revisions  
of the  
MAJOR FACILITY REVIEW PERMIT**

for  
**Los Esteros Critical Energy Facility, LLC  
Facility #B3289**

**Facility Address:**

800 Thomas Foon Chew Way  
San Jose, CA 95134

**Mailing Address:**

800 Thomas Foon Chew Way  
San Jose, CA 95134

November 2020

Application Engineer: Brenda Cabral  
Site Engineer: Dennis Jang

Application: 26519

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## **Title V Statement of Basis**

### **A. Background**

This facility is subject to the Operating Permit requirements of Title V of the federal Clean Air Act, Title 70 of Volume 40 of the Code of Federal Regulations (CFR), and BAAQMD Regulation 2, Rule 6, Major Facility Review because it is a major facility as defined by BAAQMD Regulation 2-6-212 and a Phase II Acid Rain facility as defined by BAAQMD Regulation 2-6-217. It is an Acid Rain facility because it burns fossil fuel, serves a generator that is over 25 MW that is used to generate electricity for sale, and was built after November 15, 1990. It is a major facility because it has the “potential to emit,” as defined by BAAQMD Regulation 2-6-218, more than 100 tons per year of ammonia.

Major Facility Operating permits (Title V permits) must meet specifications contained in 40 CFR Part 70 as contained in BAAQMD Regulation 2, Rule 6. The permits must contain all applicable requirements (as defined in BAAQMD Regulation 2-6-202), monitoring requirements, recordkeeping requirements, and reporting requirements. The permit holders must submit reports of all monitoring at least every six months and compliance certifications at least every year.

In the Bay Area, state and District requirements are also applicable requirements and are included in the permit. These requirements can be federally enforceable or non-federally enforceable. All applicable requirements are contained in Sections I through VI of the permit.

Each facility in the Bay Area is assigned a facility identifier that consists of a letter and a 4-digit number. This identifier is also considered to be the identifier for the permit. The identifier for this facility is B3289.

This facility received its initial Title V permit on June 10, 2004. The permit was renewed on June 6, 2012 and May 13, 2018. A significant revision was issued on June 6, 2012. A minor revision was issued on May 19, 2015.

The purpose of this revision is to increase the capacity of S11, Cooling Tower, from 73,000 gallons per minute to 90,000 gallons per minute, and to make various changes and reductions to monitoring for the four power trains. The detail of these changes is in the evaluation for Application 26518, which is attached and forms part of this Statement of Basis and will also be explained in Section C.VI, Permit Conditions. The increase in throughput at S11 is a minor revision to the permit and the reductions in monitoring are a significant revision of the Title V permit. Significant revisions require a public notice.

The proposed permit shows all changes to the permit in strikeout/underline format.

## **B. Facility Description**

The LECEF is an electric generating facility. It is located on the northern edge of the city of San Jose in Santa Clara County. The facility was online and selling electricity to the grid in March of 2003 as a simple-cycle facility consisting of four natural gas-fired turbines and rated at 180 MW.

In January 2012, LECEF ceased operation in simple-cycle mode as part of its conversion to a 320 MW combined-cycle power plant. In a combined-cycle operation, the waste heat in the turbine exhaust is recovered to make steam to turn a steam turbine and generate additional electric power, which increases the plant's overall efficiency. The conversion to combined-cycle operation entailed the addition of four heat recovery steam generators (HRSGs), one steam turbine generator and one six-cell cooling tower. The old simple-cycle operation is referred to as "Phase I", and the new combined-cycle operation is referred to as "Phase II".

The potential increase in emissions due to the increase in the throughput at S11, Cooling Tower, is 1.12 tons per year of PM10.

No increase in emissions is expected to result from the changes in monitoring.

## **C. Permit Content**

The legal and factual basis for the permit follows. The permit sections are described in the order presented in the permit.

### **I. Standard Conditions**

This section contains administrative requirements and conditions that apply to all facilities. The section will contain a standard condition pertaining to Title IV (Acid Rain) requirements for fossil-fuel fired electrical generating facilities and the accidental release (40 CFR § 68) since these programs apply. Many of these conditions derive from 40 CFR § 70.6, Permit Content, which dictates certain standard conditions that must be placed in the permit. The language that the District has developed for many of these requirements has been adopted into the BAAQMD Manual of Procedures, Volume II, Part 3, Section 4, and therefore must appear in the permit.

The standard conditions also contain references to BAAQMD Regulation 1 and Regulation 2. These are the District's General Provisions and Permitting rules.

#### Changes to permit

No changes in this action.

## **II. Equipment**

This section of the permit lists all permitted or significant sources. Each source is identified by an S and a number (e.g., S24).

Permitted sources are those sources that require a BAAQMD operating permit pursuant to BAAQMD Rule 2-1-302.

Significant sources are those sources that have a potential to emit of more than 2 tons per year of a “regulated air pollutant” (as defined in BAAQMD Rule 2-6-222) or 400 pounds per year of a “hazardous air pollutant” (as defined in BAAQMD Rule 2-6-210).

All abatement (control) devices that control permitted or significant sources are listed. Each abatement device whose primary function is to reduce emissions is identified by an A and a number (e.g., A-24). If a source is also an abatement device, such as when an engine controls VOC emissions, it will be listed in the abatement device table but will have an “S” number. An abatement device may also be a source (such as a thermal oxidizer that burns fuel) of secondary emissions. If the primary function of a device is to control emissions, it is considered an abatement (or “A”) device. If the primary function of a device is a non-control function, the device is considered to be a source (or “S”).

The equipment section is considered to be part of the facility description. It contains information that is necessary for applicability determinations, such as fuel types, contents or sizes of tanks, etc. This information is part of the factual basis of the permit.

Each of the permitted sources has previously been issued an authority to construct or a permit to operate pursuant to the requirements of BAAQMD Regulation 2, Permits. These permits are issued in accordance with state law and the District’s regulations. The capacities in the permitted sources table are the maximum allowable capacities for each source, pursuant to Standard Condition I.J and Regulation 2-1-403.

Changes to permit

The only change is that the cooling tower throughput has been increased from 73,000 to 90,000 gal/min.

**Table II-A - Permitted Sources**

Each of the following sources has been issued a permit to operate pursuant to the requirements of BAAQMD Regulation 2, Permits. The capacities in this table are the maximum allowable capacities for each source, pursuant to Standard Condition I.J and Regulation 2-1-301.

S#	Description	Make or Type	Model	Capacity
11	Six Cell Cooling Tower			<del>73,000</del> 90,000 gallons per minute

### **III. Generally Applicable Requirements**

This section of the permit lists requirements that generally apply to all sources at a facility including insignificant sources and portable equipment that may not require a District permit. If a generally applicable requirement applies specifically to a source that is permitted or significant, the standard will also appear in Section IV and the monitoring for that requirement will appear in Sections IV and VII of the permit. Parts of this section apply to all facilities (e.g., particulate, architectural coating, odorous substance, and sandblasting standards). In addition, standards that apply to insignificant or unpermitted sources at a facility (e.g., refrigeration units that use more than 50 pounds of an ozone-depleting compound) are placed in this section.

Unpermitted sources are exempt from normal District permits pursuant to an exemption in BAAQMD Regulation 2, Rule 1. They may, however, be specifically described in a Title V permit if they are considered “significant sources” as defined in BAAQMD Rule 2-6-239.

#### Changes to Permit:

No changes in this action.

### **IV. Source-Specific Applicable Requirements**

This section of the permit lists the applicable requirements that apply to permitted or significant sources. These applicable requirements are contained in tables that pertain to one or more sources that have the same requirements. The order of the requirements is:

- District Rules
- SIP Rules (if any) are listed following the corresponding District rules. SIP rules are District rules that have been approved by EPA for inclusion in the California State Implementation Plan. SIP rules are “federally enforceable” and a “Y” (yes) indication will appear in the “Federally Enforceable” column. If the SIP rule is the current District rule, separate citation of the SIP rule is not necessary and the “Federally Enforceable” column will have a “Y” for “yes”. If the SIP rule is not the current District rule, the SIP rule or the necessary portion of the SIP rule is cited separately after the District rule. The SIP portion will be federally enforceable; the non-SIP version will not be federally enforceable, unless EPA has approved it through another program.
- Other District requirements, such as the Manual of Procedures, as appropriate.
- Federal requirements (other than SIP provisions)
- BAAQMD permit conditions. The text of BAAQMD permit conditions is found in Section VI of the permit.
- Federal permit conditions. The text of Federal permit conditions, if any, is found in Section VI of the permit.

Section IV of the permit contains citations to all applicable requirements. The text of the requirements is found in the regulations, which are readily available on the District's or EPA's websites, or in the permit conditions, which are found in Section VI of the permit. All monitoring requirements are cited in Section IV. Section VII is a cross-reference between the limits and monitoring requirements. A discussion of monitoring is included in Section C.VII of this permit evaluation/statement of basis.

#### CHANGES TO PERMIT

##### Table IV-A, Turbines and Heat Recovery Steam Generators

Parts 1 through 11 of Condition 23688 have been deleted because they pertain to commissioning activities, which are complete:

Part 16, Notification of Commencement of Operations, has been deleted because it is obsolete.

Part 35, Emissions Offsets, has been deleted because the offsets have been provided.

##### Table IV-C, Cooling Towers

Condition 23688, part 47: Citation of the maximum capacity has been added.

#### **V. Schedule of Compliance**

A schedule of compliance is required in all Title V permits pursuant to BAAQMD Regulation 2-6-409.10 which provides that a major facility review permit shall contain the following information and provisions:

“409.10 A schedule of compliance containing the following elements:

- 10.1 A statement that the facility shall continue to comply with all applicable requirements with which it is currently in compliance;
- 10.2 A statement that the facility shall meet all applicable requirements on a timely basis as requirements become effective during the permit term; and
- 10.3 If the facility is out of compliance with an applicable requirement at the time of issuance, revision, or reopening, the schedule of compliance shall contain a plan by which the facility will achieve compliance. The plan shall contain deadlines for each item in the plan. The schedule of compliance shall also contain a requirement for submission of progress reports by the facility at least every six months. The progress reports shall contain the dates by which each item in the plan was achieved and an explanation of why any dates in the schedule of compliance were not or will not be met, and any preventive or corrective measures adopted.”

Since the District has not determined that the facility is out of compliance with an applicable requirement at this time, the schedule of compliance for this permit contains only sections 2-6-409.10.1 and 2-6-409.10.2.

#### Changes to permit

No changes in this action.

## **VI. Permit Conditions**

During the Title V permit development, the District has reviewed the existing permit conditions, deleted the obsolete conditions, and, as appropriate, revised the conditions for clarity and enforceability. Each permit condition is identified with a unique numerical identifier, up to five digits.

When necessary to meet Title V requirements, additional monitoring, recordkeeping, or reporting has been added to the permit.

All changes to existing permit conditions are clearly shown in “strike-out/underline” format in the proposed permit. When the permit is issued, all ‘strike-out’ language will be deleted and all “underline” language will be retained, subject to consideration of comments received.

The existing permit conditions are derived from previously issued District Authorities to Construct (A/C) or Permits to Operate (P/O). Permit conditions may also be imposed or revised as part of the annual review of the facility by the District pursuant to California Health and Safety Code (H&SC) § 42301(e), through a variance pursuant to H&SC § 42350 *et seq.*, an order of abatement pursuant to H&SC § 42450 *et seq.*, or as an administrative revision initiated by District staff. After issuance of the Title V permit, permit conditions will be revised using the procedures in Regulation 2, Rule 6, Major Facility Review.

The regulatory basis is listed following each condition. The regulatory basis may be a rule or regulation. The District is also using the following terms for regulatory basis:

- **BACT:** This term is used for a condition imposed by the Air Pollution Control Officer (APCO) to ensure compliance with the Best Available Control Technology in Regulation 2-2-301.
- **Cumulative Increase:** This term is used for a condition imposed by the APCO, which limits a source’s operation to the operation described in the permit application pursuant to BAAQMD Regulation 2-1-403.
- **Offsets:** This term is used for a condition imposed by the APCO to ensure compliance with the use of offsets for the permitting of a source or with the banking of emissions from a source pursuant to Regulation 2, Rules 2 and 4.
- **PSD:** This term is used for a condition imposed by the APCO to ensure compliance with a Prevention of Significant Deterioration permit issued pursuant to Regulation 2, Rule 2.
- **Regulation 2, Rule 5:** This term is used for a condition imposed by the APCO to ensure compliance with limits based on Regulation 2, Rule 5 New Source Review of Toxic Air Contaminants.



Changes to permit:

The revised condition 23688 can be seen in the proposed permit and in the permit evaluation for Application 26518, which is attached to this Statement of Basis in Appendix B and forms part of this Statement of Basis. A more complete rationale for the changes can be found in the permit evaluation for Application 26518.

The definitions of commissioning activities and commissioning period have been removed because the commissioning is complete.

The maximum throughput of the six-cell cooling tower, S11, has been increased to 90,000 gallons per minute.

Parts 1 through 11 of the conditions have been deleted because they concern the commissioning of the equipment, which is now complete.

Part 16, Notification of Commencement of Operations, has been deleted because it is obsolete.

Part 19d: The District has agreed to change the POC limit to a clock hour average.

Part 24a: The District has agreed to allow the facility to use PG&E's sulfur data because it is more accurate. The facility will still take measurements during any source test.

Part 26a has been amended to delete obsolete requirements.

Part 26b has been amended to reduce the source test frequency from annually to every 8,000 hours of operation or every three years, whichever is sooner. In addition, if a power train is not operating when the 8,000 hours or three years are up, the facility may postpone testing until the power train starts up. The facility requested a reduction in source testing because the power trains are not being used full time.

Parts 26b.f and g have been amended to require sulfur analysis for source tests

Part 27 has been amended to reduce the source test frequency from annually to every 8,000 hours of operation or every three years, whichever is sooner.

Part 34.g has been amended to allow the facility to use PG&E's sulfur data.

Part 35, Emissions Offsets, has been deleted because the offsets have been provided.

Part 45 has been amended to delete the requirements for testing formaldehyde and acetaldehyde. The condition allowed the facility to discontinue testing if three consecutive tests showed that emissions were below the triggers in the BAAQMD Toxic Risk Management Policy.

Part 47 has been amended to allow a throughput of 90,000 gpm at the cooling tower, S11, and to delete obsolete conditions.

## **VII. Applicable Limits and Compliance Monitoring Requirements**

This section of the permit is a summary of numerical limits and related monitoring requirements for each source. The summary includes a citation for each monitoring requirement, frequency of monitoring, and type of monitoring. The applicable requirements for monitoring are completely contained in Sections IV, Source-Specific Applicable Requirements, and VI, Permit Conditions, of the permit.

The District has reviewed the limits for which there is no monitoring required and has determined that additional monitoring is not required. The District has also examined the monitoring for other limits and has determined that the monitoring is adequate to provide a reasonable assurance of compliance. Calculations for potential to emit are provided in the discussion when no monitoring is proposed due to the size of a source.

Monitoring decisions are typically the result of a balancing of several different factors including: 1) the likelihood of a violation given the characteristics of normal operation, 2) degree of variability in the operation and in the control device, if there is one, 3) the potential severity of impact of an undetected violation, 4) the technical feasibility and probative value of indicator monitoring, 5) the economic feasibility of indicator monitoring, and 6) whether there is some other factor, such as a different regulatory restriction applicable to the same operation, that also provides some assurance of compliance with the limit in question.

These factors are the same as those historically applied by the District in developing monitoring for applicable requirements. It follows that, although Title V calls for a re-examination of all monitoring, there is a presumption that these factors have been appropriately balanced and incorporated in the District's prior rule development and/or permit issuance. It is possible that, where a rule or permit requirement has historically had no monitoring associated with it, no monitoring may still be appropriate in the Title V permit if, for instance, there is little likelihood of a violation. Compliance behavior and associated costs of compliance are determined in part by the frequency and nature of associated monitoring requirements. As a result, the District will generally revise the nature or frequency of monitoring only when it can support a conclusion that existing monitoring is inadequate.

An exhaustive discussion of the monitoring is contained in the Statement of Basis for the renewal of the permit on May 30, 2018 pursuant to Application 28412. This Statement of Basis will only discuss the changes in monitoring.

Source testing for various pollutants and parameters has been reduced from annually to every 8,000 hours or every three years, whichever is sooner. The reason is that the power trains are not in constant use. Every 8,000 hours is roughly equivalent to a year of use.

Source testing for formaldehyde and acetaldehyde has been eliminated. The original condition state that the tests could be eliminated if three consecutive biennial source tests demonstrated that the annual emission rates for formaldehyde and acetaldehyde were less than the BAAQMD Toxic Risk Management Policy trigger levels.

<b><u>Reduced Source Testing for S1, S2, S3, &amp; S4, S14, Combustion Gas Turbines</u></b> <b><u>S7, S8, S9, S10, HRSGs</u></b>			
<b>Limit</b>	<b>Emission Limit Citation</b>	<b>Federally Enforceable Emission Limit</b>	<b>Monitoring</b>
PM10	BAAQMD condition #23688, part 22	38.5 tons/year PM10 for all turbines and HRSGs combined including startup and shutdown.	Source test every 8,000 hours or every 3 years, whichever is sooner
NOx	BAAQMD 9-9-301.1.3	9 ppmv @ 15% O2, dry	CEM and source test every 8,000 hours or every 3 years, whichever is sooner
CO	BAAQMD Condition #23688 Part 19c	2 ppmv @ 15% O2, dry 1-hr average except during turbine startup or shutdown	CEM and source test every 8,000 hours or every 3 years, whichever is sooner
CO	BAAQMD Condition #23688 Part 19c	2.85 lb CO/hr for each turbine/HRSG, 1-hr average except during turbine startup or shutdown	CEM and source test every 8,000 hours or every 3 years, whichever is sooner
POC	BAAQMD condition #23688, part 19d	1 ppmv @ 15% O2, dry, 1-hr average except during turbine startup or shutdown	Source test every 8,000 hours or every 3 years, whichever is sooner
POC	BAAQMD condition #23688, part 22	20.2 lb/day for each turbine including startup and shutdown	Source test every 8,000 hours or every 3 years, whichever is sooner, records, and calculations
POC	BAAQMD condition #23688 part 22	80.8 lb/day for all turbines combined, including startup and shutdown	Source test every 8,000 hours or every 3 years, whichever is sooner, records, and calculations

<b><u>Reduced Source Testing for S1, S2, S3, &amp; S4, S14, Combustion Gas Turbines S7, S8, S9, S10, HRSGs</u></b>			
<b>Limit</b>	<b>Emission Limit Citation</b>	<b>Federally Enforceable Emission Limit</b>	<b>Monitoring</b>
POC	BAAQMD condition #23688 part 22	12.3 tons/year for all turbines combined including startup and shutdown.	Source test every 8,000 hours or every 3 years, whichever is sooner, records, and calculations
POC	BAAQMD condition #23688 part 20	2 lb/turbine/startup during startup not to exceed 120 minutes	Source test every 8,000 hours or every 3 years, whichever is sooner, records, and calculations
NH3	BAAQMD condition #23688, part 19b	5 ppmv @ 15% O2, dry, averaged over 3 hrs except during turbine startup or shutdown	Source test every 8,000 hours or every 3 years, whichever is sooner, records, and calculations
NH3	BAAQMD condition #23688 part 22	56.9 tons/year for all turbines combined including startup and shutdown.	Source test every 8,000 hours or every 3 years, whichever is sooner, records, and calculations
Formaldehyde	BAAQMD condition #23688 part 43 (combined cycle)	6490 pounds/year for all turbines combined	None
Acetaldehyde	BAAQMD condition #23688 part 43 (combined cycle)	3000 pounds/year for all turbines combined	None

The requirement to test the fuel for sulfur on a monthly basis has been removed. The facility will rely on the utility's quarterly results for sulfur in fuel. PG&E measures sulfur at more than eleven locations in the Bay Area using online sulfur chromatographs. PG&E reports an average and a high value for each quarter. Calpine analyzes a monthly sample by ASTM Method D5504. The gas chromatograph method is considered to be more accurate. Calpine will still analyze the sulfur in a sample of the fuel for each source test.

<b><u>Reduced Sulfur Analysis for S1, S2, S3, &amp; S4, S14, Combustion Gas Turbines S7, S8, S9, S10, HRSGs</u></b>			
<b>S# &amp; Description</b>	<b>Emission Limit Citation</b>	<b>Federally Enforceable Emission Limit</b>	<b>Monitoring</b>
SO2	BAAQMD 9-1-302	300 ppm (dry)	Fuel Gas Total sulfur content analysis by utility
SO2	BAAQMD condition #23688, part 22 (combined cycle)	6.43 tons/calendar year for All turbines combined including startup and shutdown of turbines except during commissioning	Fuel Gas Total sulfur content analysis by utility, calculations, source test every 8,000 hours or every 3 years, whichever is sooner

**Changes to permit:**

Table VII-A will be changed as follows:

- The commissioning limits for NOx, CO, POC, and unabated firing will be deleted.
- The source test frequency for the emissions and parameters below has been reduced to every 8000 hours of operation or every 3 years, whichever is sooner. The source test may be postponed if the power train is not operating on the deadline date. A sulfur analysis has been added to the periodic source test.
  - NOx
  - CO
  - SO2
  - PM10
  - POC
  - Ammonia
  - Ammonia injection rate
  - Sulfuric acid mist
  - Heat input
  - MW output
  - Gas temperature
  - Stack gas flow
  - Water injection rate
- The periodic monitoring for sulfur in fuel has been changed from monthly analyses by the owner/operator to quarterly vendor data.
- The 1 ppmvd @ 15% O2 POC concentration limit has been changed from an hourly basis to a clock-hour basis.
- The source test requirement for formaldehyde and acetaldehyde have been removed.

- The frequency of the fuel composition analysis requirement for monitoring of the heat input limit has been corrected from monthly to quarterly in the line for monitoring the heat input limit of 639 MMbtu/hr for each turbine/duct burner train. Condition 25d required quarterly analyses, so this correction is a typo and the frequency is cited correctly in other parts of the table.

Table VII-C will be changed as follows:

- The one-cell tower will be described as exempt from permits.
- The 90,000 gpm limit will be added for S11, Six-Cell Cooling Tower.

### **VIII. Test Methods**

This section of the permit lists test methods that are associated with standards in District or other rules. It is included only for reference. In most cases, the test methods in the rules are source test methods that can be used to determine compliance but are not required on an ongoing basis. They are not applicable requirements.

If a rule or permit condition requires ongoing testing, the requirement will also appear in Section IV of the permit.

#### Changes to permit

No changes in this action.

### **IX. Acid Rain**

#### Changes to permit

No changes in this action.

### **X. Permit Shield**

The District rules allow two types of permit shields. The permit shield types are defined as follows: (1) A provision in a major facility review permit explaining that specific federally enforceable regulations and standards do not apply to a source or group of sources, or (2) A provision in a major facility review permit explaining that specific federally enforceable applicable requirements for monitoring, recordkeeping and/or reporting are subsumed because other applicable requirements for monitoring, recordkeeping, and reporting in the permit will assure compliance with all emission limits.

The second type of permit shield is allowed by EPA's White Paper 2 for Improved Implementation of the Part 70 Operating Permits Program. The District uses the second type of permit shield for all streamlining of monitoring, recordkeeping, and reporting requirements in Title V permits. The District's program does not allow other types of streamlining in Title V permits.

This facility does not have permit shields.

Changes to permit

No changes in this action.

**XI. Revision History**

This section details the revision history of the facility's Title V permit.

Changes to permit:

The revision history will be updated when the permit is revised.

**XII. Glossary**

This section contains terms that may be unfamiliar to the general public or EPA.

Changes to permit

Definitions of CPM (CEC Compliance Project Manager) and NH<sub>3</sub> (ammonia) have been added.

**XIII. Title IV Permit Application**

The Acid Rain permit application for the facility is part of the Title V permit. The current Title IV permit application has been appended to the Title IV permit in section IX of the Title V permit.

**D. Alternate Operating Scenarios**

No alternate operating scenario has been requested for this facility.

**E. Compliance Status**

Changes to permit

No changes in this action.

***APPENDIX A***

***Glossary***



**ACT**

Federal Clean Air Act

**APCO**

Air Pollution Control Officer

**ARB**

Air Resources Board

**BAAQMD**

Bay Area Air Quality Management District

**BACT**

Best Available Control Technology

**Basis**

The rule or regulation that gives the District authority to impose requirements

**CAA**

The federal Clean Air Act

**CAAQS**

California Ambient Air Quality Standards

**CAPCOA**

California Air Pollution Control Officers Association

**CEQA**

California Environmental Quality Act

**CFR**

The Code of Federal Regulations - 40 CFR contains the implementing regulations for federal environmental statutes such as the Clean Air Act. Parts 50-99 of 40 CFR contain the requirements for air pollution programs.

**CO**

Carbon Monoxide

**Cumulative Increase**

The sum of permitted emissions from each new or modified source since a specified date pursuant to BAAQMD Rule 2-1-403, Permit Conditions (as amended by the District Board on 7/17/91) and SIP Rule 2-1-403, Permit Conditions (as approved by EPA on 6/23/95). Cumulative increase is used to determine whether threshold-based requirements are triggered.

**District**

The Bay Area Air Quality Management District

**dscf**

Dry Standard Cubic Feet

**EPA**

The federal Environmental Protection Agency.

**Excluded**

Not subject to any District regulations.

**Federally Enforceable, FE**

All limitations and conditions which are enforceable by the Administrator of the EPA including those requirements developed pursuant to 40 CFR Part 51, subpart I (NSR), Part 52.21 (PSD), Part 60 (NSPS), Part 61 (NESHAPs), Part 63 (MACT), and Part 72 (Permits Regulation, Acid Rain), including limitations and conditions contained in operating permits issued under an EPA-approved program that has been incorporated into the SIP.

**FP**

Filterable Particulate as measured by BAAQMD Method ST-15, Particulate.

**HAP**

Hazardous Air Pollutant. Any pollutant listed pursuant to Section 112(b) of the Act. Also refers to the program mandated by Title I, Section 112, of the Act and implemented by 40 CFR Part 63.

**Major Facility**

A facility with potential emissions of: (1) at least 100 tons per year of regulated air pollutants, (2) at least 10 tons per year of any single hazardous air pollutant, and/or (3) at least 25 tons per year of any combination of hazardous air pollutants, or such lesser quantity of hazardous air pollutants as determined by the EPA administrator.

**MFR**

Major Facility Review. The District's term for the federal operating permit program mandated by Title V of the Federal Clean Air Act and implemented by District Regulation 2, Rule 6.

**MOP**

The District's Manual of Procedures.

**NAAQS**

National Ambient Air Quality Standards

**NESHAPS**

National Emission Standards for Hazardous Air Pollutants. See in 40 CFR Parts 61 and 63.

**NMHC**

Non-methane Hydrocarbons (Same as NMOC)

**NH3**

Ammonia

**NMOC**

Non-methane Organic Compounds (Same as NMHC)

**NOx**

Oxides of nitrogen.

**NSPS**

Standards of Performance for New Stationary Sources. Federal standards for emissions from new stationary sources. Mandated by Title I, Section 111 of the Federal Clean Air Act, and implemented by 40 CFR Part 60 and District Regulation 10.

**NSR**

New Source Review. A federal program for pre-construction review and permitting of new and modified sources of pollutants for which criteria have been established in accordance with Section 108 of the Federal Clean Air Act. Mandated by Title I of the Federal Clean Air Act and implemented by 40 CFR Parts 51 and 52 and District Regulation 2, Rule 2. (Note: There are additional NSR requirements mandated by the California Clean Air Act.)

**Offset Requirement**

A New Source Review requirement to provide federally enforceable emission offsets for the emissions from a new or modified source. Applies to emissions of POC, NOx, PM10, and SO2.

**Phase II Acid Rain Facility**

A facility that generates electricity for sale through fossil-fuel combustion and is not exempted by 40 CFR 72 from Titles IV and V of the Clean Air Act.

**POC**

Precursor Organic Compounds

**PM**

Particulate Matter

**PM10**

Particulate matter with aerodynamic equivalent diameter of less than or equal to 10 microns

**PSD**

Prevention of Significant Deterioration. A federal program for permitting new and modified sources of those air pollutants for which the District is classified "attainment" of the National Air Ambient Quality Standards. Mandated by Title I of the Act and implemented by both 40 CFR Part 52 and District Regulation 2, Rule 2.

**SIP**

State Implementation Plan. State and District programs and regulations approved by EPA and developed in order to attain the National Air Ambient Quality Standards. Mandated by Title I of the Act.

**SO2**

Sulfur dioxide

**THC**

Total Hydrocarbons (NMHC + Methane)

**Title V**

Title V of the federal Clean Air Act. Requires a federally enforceable operating permit program for major and certain other facilities.

**TOC**

Total Organic Compounds (NMOC + Methane, Same as THC)

**TPH**

Total Petroleum Hydrocarbons

**TSP**

Total Suspended Particulate

**VOC**

Volatile Organic Compounds

**Units of Measure:**

bhp	=	brake-horsepower
btu	=	British Thermal Unit
cfm	=	cubic feet per minute
g	=	grams
gal	=	gallon
gpm	=	gallons per minute
hp	=	horsepower
hr	=	hour
lb	=	pound
in	=	inches
max	=	maximum
m <sup>2</sup>	=	square meter
min	=	minute
mm	=	million
MMbtu	=	million btu
MMcf	=	million cubic feet
ppmv	=	parts per million, by volume
ppmw	=	parts per million, by weight
psia	=	pounds per square inch, absolute
psig	=	pounds per square inch, gauge
scfm	=	standard cubic feet per minute
yr	=	year



**Appendix B, Evaluation for Application 26518**

**FINAL EVALUATION REPORT**  
**Los Esteros Critical Energy Facility, LLC**  
**Facility B3289, Application 26518**  
**800 Thomas Foon Chew Way**  
**San Jose, CA 95134**

**Background**

Los Esteros Critical Energy Facility, LLC, (Los Esteros) has applied to increase the throughput at the following source from 73,000 gpm to 90,000 gpm:

S11 Six-cell Cooling Tower

Calpine is the applicant's parent company.

Calpine has also applied for various changes to the permit conditions. These changes would affect the following sources:

- S1 Combustion Gas Turbine #1, 500 MMbtu/hr, natural gas fired, abated by A-9 Oxidation Catalyst and A-10 Selective Catalytic Reduction System.
- S2 Combustion Gas Turbine #2, 500 MMbtu/hr, natural gas fired, abated by A-11 Oxidation Catalyst and A-12 Selective Catalytic Reduction System.
- S3 Combustion Gas Turbine #3, 500 MMbtu/hr, natural gas fired, abated by A-13 Oxidation Catalyst and A-14 Selective Catalytic Reduction System.
- S4 Combustion Gas Turbine #4, 500 MMbtu/hr, abated by A-15 Oxidation Catalyst and A-16 Selective Catalytic Reduction System.
- S7 Heat Recovery Steam Generator #1, 139 MMbtu/hr, natural gas fired, abated by A-9 Oxidation Catalyst and A-10 Selective Catalytic Reduction System.
- S8 Heat Recovery Steam Generator #2, 139 MMbtu/hr, natural gas fired, abated by A-11 Oxidation Catalyst and A-12 Selective Catalytic Reduction System.
- S9 Heat Recovery Steam Generator #3, 139 MMbtu/hr, natural gas fired, abated by A-13 Oxidation Catalyst and A-14 Selective Catalytic Reduction System.

S10 Heat Recovery Steam Generator #4, 139 MMbtu/hr, natural gas fired, abated by A-15 Oxidation Catalyst and A-16 Selective Catalytic Reduction System.

S14, Combustion Gas Turbine, 500 MMbtu/hr, natural gas fired, abated by Oxidation Catalyst and Selective Catalytic Reduction System.

A list of the desired changes follows:

1. Add definition of "Annual" meaning "within a calendar year."
2. Revise of definition of "Clock Hour" to include: "Unless otherwise defined, any reference to the word hour is a clock hour."
3. Delete Condition 21, because "Gas Turbine Shutdown Mode" is defined in the definitions and in Condition 21 and the definitions are inconsistent.
4. Delete the requirement for monthly monitoring of sulfur in natural gas (or obtaining the results of the analyses of the vendor) and rely on quarterly vendor analyses.
5. Delete the requirement for quarterly monitoring of the higher heating value of the fuel and rely on vendor analyses.
6. Reduce the frequency of sulfuric acid mist (SAM) source tests from twice a year to once every 8,000 hours of operation per power train or every three years, whichever is earlier.
7. Reduce the frequency of testing for criteria pollutants in part 26b to once every 8,000 hours of operation per power train or every three years, whichever is earlier.
8. Delete the definitions for commissioning activities since these are obsolete.
9. Delete the commissioning conditions since these are obsolete.
10. Delete other obsolete conditions

Any of the above changes must first be approved by the California Energy Commission (CEC) because the CEC is the primary permitting authority.

Following is a discussion of the desired changes:

1. The owner/operator wishes to define the term "annual" as meaning "within a calendar year." The term "annual" appears in the following places in the permit conditions:
  - a. Part 22, which mentions annual mass emission limits
  - b. Part 24, which mentions annual NOx and CO emission limits
  - c. Part 26a, which mentions annual RATAs for the CEMs
  - d. Part 26b, which mentions annual source testing
  - e. Part 27, which mentions semi-annual source testing for SAM
  - f. Part 32, which mentions annual recordkeeping for fuel usage

Response: The mass emission limits in parts 22 and 24 are defined as being on a 12-consecutive month basis. The yearly fuel input limit in part 24a is on a yearly basis, which is defined as every 12-consecutive month period. This means that the owner/operator must be below the limits in every 12-consecutive month period. Therefore, the term "annual" in parts 22 and 24 cannot be defined as a calendar year.

The problem that the owner/operator is trying to solve is the problem of testing equipment that is not operating due to an operational or maintenance problem or due to market conditions on an annual basis. The District proposes to solve the problem by requiring testing every twelve months but allowing a test to be postponed if the equipment is not operating.

2. The owner/operator wishes to change the definition of the term “clock hour” to include: “Unless otherwise defined, any reference to the word hour is a clock hour.” The term “hour” appears in the following places in the permit conditions:

- a. Definition of Calendar Day
- b. Definition of Firing Hours
- c. Description of heat input of HRSG
- d. Part 18-visible emissions limit
- e. Part 19a, NO<sub>x</sub> concentration and mass emission limits on 1 hour rolling average
- f. Part 19b, NH<sub>3</sub> concentration emission limit on 3 hour rolling average
- g. Part 19c, CO concentration and mass emission limits on 1 hour rolling average
- h. Part 19d, POC concentration and mass emission limits on 1 hour average
- i. Part 22, calculation for mass emission limits

Response: A clock hour is not appropriate for rolling averages. The POC limits in 19d could be on a clock hour average. The District declines to change the definition, but will change the limits in part 19d to clock hour averages.

3. The owner/operator wishes to delete Condition 21, because “Gas Turbine Shutdown Mode” is defined in the definitions and in Condition 21 and the definitions are inconsistent.

Response: The definition, which is before the permit conditions, is: “The lesser of the 30-minute period immediately prior to the termination of fuel flow to the Gas Turbine or the period of time from non-compliance with any requirement listed in subparts 19(a) through 19(d) until termination of fuel flow to the Gas Turbine.” Following is the wording of Condition 21: “Turbine Shutdown: The project owner shall operate the gas turbines so that the duration of a shutdown does not exceed 30 minutes per event, or other time period based on good engineering practice that has been approved in advance by the BAAQMD.”

Condition 21 is a limit that does not contradict the definition. The District declines to make this change.

4. The owner/operator wishes to delete the requirement for monthly monitoring of sulfur in natural gas (or obtaining the results of the analyses



of the vendor) and rely on quarterly vendor analyses on PG&E's website at [https://www.pge.com/pipeline/operations/sulfur/sulfur\\_info\\_values/index.page](https://www.pge.com/pipeline/operations/sulfur/sulfur_info_values/index.page).

Response: CEC staff requested information on the sulfur monitoring conducted by the vendor, PG&E. The responses are attached in Appendix A. PG&E measures sulfur at more than eleven locations in the Bay Area using online sulfur chromatographs. PG&E reports an average and a high value for each quarter. The specification for PG&E gas is 1.0 grain sulfur/100 scf of gas, but the average is usually about 0.25 grain sulfur/100 scf of gas. The highest level reported since 2006 was 0.713 grain sulfur/100 scf of gas for the third quarter of 2009.

Calpine analyzes a monthly sample by ASTM Method D5504. The gas chromatograph method is considered to be more accurate. However, the Calpine analyses were more frequent and were taken at the source. Due to the improved accuracy, District staff has decided to allow Calpine to use PG&E's data, with the exception of the data used for the source tests that are performed every 8,000 hours of operation or every three years, whichever is sooner.

5. The owner/operator wishes to delete the requirement for quarterly monitoring of the higher heating value of the fuel and to rely on vendor analyses at:

[https://www.pge.com/pipeline/operations/therms/heat\\_value.page](https://www.pge.com/pipeline/operations/therms/heat_value.page).

Response: PG&E's analyses of the higher heating value should be sufficient to determine compliance with the hourly, daily, and annual heat input limits. The District proposes to make the change.

6. The owner/operator wishes to reduce the frequency of sulfuric acid mist (SAM) source tests from twice a year to once every 8,000 hours of operation per power train or every three years, whichever is earlier.  
Response: The permit condition was written to allow for this reduction in the variability of the sulfuric acid mist concentration was low. The four tests in 2016 vary from 0.0004 grains/MMbtu to 0.0005 grains/MMbtu. At 0.0005 grains/MMbtu and full capacity, the power trains would emit about 5.6 tpy of SAM. Performance could also deteriorate in the future.

On the other hand, the throughput at this facility has decreased significantly in 2016 and 2017, lowering the SAM emissions. On February 14, 2018, the facility suggested changing the frequency to once every 8,000 hours or every three years, whichever is sooner. This is equivalent to once for every year of running time. The District finds this proposal to be acceptable.

7. The owner/operator wishes to reduce the frequency of testing for criteria pollutants in part 26b to once every 8,000 hours of operation per power train or every three years, whichever is earlier.

Response: The throughput at this facility has decreased significantly in 2016 and 2017, lowering emissions. On February 14, 2018, the facility suggested changing the frequency to once every 8,000 hours or every three years, whichever is sooner. This is equivalent to once for every year of running time. The District finds this proposal to be acceptable.

8. On March 1, 2018, the owner/operator proposed deleting the testing requirement for formaldehyde and acetaldehyde in part 45 of the condition because the condition allowed for deletion of the requirement if the formaldehyde was below 132 lb/yr and the acetaldehyde was below 288 lb/yr for three tests or more.

Response: The District agrees to this change.

9. The owner/operator wishes to delete the definitions for commissioning activities since these are obsolete.

Response: The District concurs.

10. The owner/operator wishes to delete the commissioning conditions since these are obsolete.

Response: The District concurs.

11. The owner/operator wished to delete other obsolete conditions, such as initial source testing conditions.

Response: The District concurs.

## **Emissions**

### Cooling Tower, S11

Following are the particulate emissions as calculated for the second renewal of the Authority to Construct issued pursuant to Application 8859.

#### Emissions for Six Cell Cooling Tower

It is conservatively assumed that all particulate matter emissions are PM<sub>10</sub>.

Cooling tower circulation rate: 73,000 gpm

maximum total dissolved solids: 6,000 ppm

Drift Rate: 0.0005 %

Water mass flow rate:

$$(73,000 \text{ gal/min})(60 \text{ min/hr})(8.34 \text{ lb/gal}) = 36,529,200 \text{ lb/hr}$$

Cooling Tower Drift:

$$(36,529,200 \text{ lb/hr})(0.000005) = 182.65 \text{ lb/hr}$$

$$\text{PM}_{10} = (6,000 \text{ ppm})(182.65 \text{ lb/hr})/(10^6)$$

$$= 1.096 \text{ lb/hr}$$

$$= 26.30 \text{ lb/day} \quad (24 \text{ hr/day operation})$$

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= 9600 lb/yr (8,760 operating hours per year)  
 = 4.80 ton/yr

If the flow of water increases from 73,000 gpm to 90,000 gpm, the particulate emissions will increase to 5.92 tpy, a difference of 1.12 tpy.

The increase for toxic air contaminants was not included in Application 8859. However, chloroform is emitted from the water due to the addition of hypochlorite to the water.

For both towers  
 48 gal hypochlorite/day  
 13 gal sulfuric acid/day

Hypochlorite addition, daily	48	gal/day
Hypochlorite addition, annual	17520	gal/yr
NaOCL	12.50%	wt percent
Specific gravity NaOCl solution	1.2	
Density of water	8.34	lb/gal
Quantity NaOCl	1.25	lb/gal
Quantity Cl	0.6	lb/gal
Emission factor <sup>1</sup>	0.0034	lb chloroform/lb chlorine eq.
Factor to convert Cl in NaOCl to Cl eq. <sup>2</sup>	0.9525	
Total chlorine	10512	lb/yr
Total chlorine eq.	10013	lb/yr
Estimated chloroform	34.0	lb/yr
Toxic Trigger	20	lb/yr

Note 1: "Proposed Identification of Chloroform as a Toxic Air Contaminant, Part A, Exposure Assessment", Page 4-53.

Note 2: "Proposed Identification of Chloroform as a Toxic Air Contaminant, Part A, Exposure Assessment", Page 4-8.

In addition, the owner/operator now has concentrations of TACs in the water as follows:

Constituent	Conc in cooling water	
	return	units
Ammonia	3	ppb
Arsenic	1.4	ppb
Cadmium	2.9	ppb
Chromium (III)	2.4	ppb
Copper	12.3	ppb

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Lead	3.2	ppb
Mercury	0.26	ppb
Nickel	22.6	ppb
Silver	1	ppb
Zinc	144	ppb

Following are the TAC emissions from S11 based on a drift of 0.0005%, which is equivalent to 225.18 lb water/hr lost.

TAC	lb/hr	lb/yr
Ammonia	6.76E-07	5.92E-03
Arsenic	3.15E-07	2.76E-03
Cadmium	6.53E-07	5.72E-03
Chromium (III)	5.40E-07	4.73E-03
Copper	2.77E-06	2.43E-02
Lead	7.21E-07	6.31E-03
Mercury	5.85E-08	5.13E-04
Nickel	5.09E-06	4.46E-02
Silver	2.25E-07	1.97E-03
Zinc	3.24E-05	2.84E-01
Chloroform	3.30E-03	2.89E+01

Following are the TAC emissions from the exempt cooling tower based on a drift of 0.0005%, which is equivalent to 3.98 lb water/hr lost.

TAC	lb/hr	lb/yr
Ammonia	1.19E-08	1.05E-04
Arsenic	5.57E-09	4.88E-05
Cadmium	1.15E-08	1.01E-04
Chromium (III)	9.55E-09	8.37E-05
Copper	4.90E-08	4.29E-04
Lead	1.27E-08	1.12E-04
Mercury	1.03E-09	9.06E-06
Nickel	8.99E-08	7.88E-04
Silver	3.98E-09	3.49E-05
Zinc	5.73E-07	5.02E-03
Chloroform	0.00E+00	5.13E+00

**Plant Cumulative Increase (tons/year)/Offsets**

Application #	Post-1991 PM10 increases
3213	44.20
8859	18.20
26518 (new)	1.12

Total 63.52

BAAQMD Regulation 2-2-303 does not require offsets for PM10 until a facility has a potential to emit over 100 tpy of PM10. Therefore, there is no BAAQMD offset requirement for the previous or new increases.

However, the California Energy Commission (CEC) did require mitigation of the PM10 emissions. The applicant supplied 47.84 tpy of SO2 offsets to mitigate the PM emissions from Application 8859.<sup>1</sup> For Application 3213, issued in 2002, the CEC required 22.229 tpy of PM10 emissions from October through March in Condition AQ-SC4, quoted below:<sup>2</sup>

**AQ-SC4** The project owner shall provide emission reductions sufficient to mitigate the project PM10 emissions of 44,238 lbs/year from October through March. This mitigation shall preferably be combustion sources within CPM approved proximity of the project site. This mitigation will be preferably targeted for the months of October through March of each year. This mitigation shall be approved by the CPM in total and initiated prior to first fire and must be fully realized prior to the second year of operation. This mitigation shall be developed from the following sources in order of preference:

1. The Bay Area Air Quality Management District, Wood Stove Retrofit or Replacement Program.
2. The Lower-Emission School Buses Program.
3. Other mitigation measures approved by the CPM via written CEC Air Quality Staff review.
4. The California Air Resources Board, Carl Moyer Program.
5. Emission Reduction Credits banked with the Bay Area Air Quality Management District and approved by the CPM via written CEC Air Quality Staff review.

### Toxic Risk Screening

Following are the total TAC emissions from both cooling towers compared to the acute and annual triggers in BAAQMD Regulation 2, Rule 5, New Source Review for Toxic Air Contaminants, as of January 6, 2010:

TAC	lb/hr	Trigger	lb/yr	Trigger
Ammonia	6.87E-07	7.10E+00	6.02E-03	7.70E+03
Arsenic	3.21E-07	4.40E-04	<b>2.81E-03</b>	<b>1.60E-03</b>

<sup>1</sup> CEC Final Commission Decision on Los Esteros Critical Energy Facility II-Phase 2, October 2006, Page 166

<sup>2</sup> CEC Commission Decision on Los Esteros Critical Energy Facility Project, July 2002, Pages 121-122, 130-131

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Cadmium	6.65E-07	none	5.82E-03	1.90E-02
Chromium (III)	5.50E-07	none	4.82E-03	none
Copper	2.82E-06	2.20E-01	2.47E-02	none
Lead	7.33E-07	none	6.42E-03	2.10E-01
Mercury	5.96E-08	1.30E-03	5.22E-04	2.70E-01
Nickel	5.18E-06	3.10E-05	4.54E-02	3.10E-01
Silver	2.29E-07	none	2.01E-03	none
Zinc	3.30E-05	none	2.89E-01	none
Chloroform	3.30E-03	3.30E-01	<b>3.40E+01</b>	<b>2.00E+01</b>

Results of the health risk screening analysis are a maximum cancer risk of 0.002 in a million, a chronic hazard index of 0.00009, and an acute hazard index of 0.0002. In accordance with Regulation 2, Rule 5, these risks are considered to be acceptable.

### Public Notification

Since this plant is not located within 1000 ft. of a school, public notification for the purposes of District Regulation 2-1-412 is not required. However, the change will undergo a public notice process that will be handled by the California Energy Commission.

### Statement of Compliance

A thorough discussion of applicable requirements is contained in the Final Determination of Compliance published on June 2, 2005, which is available upon request, and the Statement of Basis for the significant revision of the Title V permit, issued on June 6, 2012, which is available on the District's website at: <http://www.baaqmd.gov/Divisions/Engineering/Title-V-Permit-Programs/Title-V-Permits/Santa-Clara/B3289/Los-Esteros-Critical-Energy-Facility.aspx>.

The proposed changes to the permit conditions will not change applicable requirements.

### CEQA

The California Energy Commission (CEC) is the state permitting agency for power plants. The CEC has a process that is equivalent to CEQA review. The CEC concluded that the changes would not result in a significant impact on the environment or cause the project to not comply with applicable laws, ordinances, regulations, and standards. The changes were noticed on CEC's website on August 20, 2020, and because there were no comments, were considered final on September 4, 2020.

### Best Available Control Technology (BACT)

Turbines/HRSGs

The proposed changes in permit conditions will not change the daily or annual emissions. Therefore, these sources are not subject to a new BACT determination.

#### Cooling towers

S11, Cooling Tower, can emit up to 29.3 lb PM10/day and is subject to BACT. The existing requirements of a drift of 0.0005% and a dissolved solids limit of 6,000 ppm are considered to be BACT. Therefore, the source complies with BACT.

The exempt cooling tower is not subject to BACT.

#### **PSD, Prevention of Significant Deterioration**

PSD does not apply to this project. PSD applies to a project that causes a “significant” increase in the emissions of air pollutants defined in 40 CFR 51.166(b)(23)(i) and (ii).

#### **Title V**

The increase in capacity of S11 is considered to be a minor revision of the Title V permit.

The reductions in monitoring are considered to be a significant revision of the Title V permit. BAAQMD Regulation 2-6-226.3 defines the following as a significant revision to the Title V permit:

“Any significant change or relaxation of any applicable monitoring, reporting or recordkeeping condition.”

The facility can act on any minor revisions as soon as they are approved in accordance with BAAQMD Regulation 2-6-406. The facility must wait for public notice and EPA review before acting on the significant revisions.

However, the District cannot approve any revisions until after CEC approval.

#### **CEC Requirements**

The California Energy Commission (CEC) is the primary permitting authority for power plants of this size in California. Calpine submitted a petition for changes on August 22, 2018. The District submitted a final analysis of the proposed changes to CEC on February 24, 2020. The proposed changes were posted on CEC’s website on August 20, 2020 at the following address: <https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=03-AFC-02C> for 14 days. The CEC determined that a public hearing at a Business Meeting of the Energy Commission was not necessary. The Commission considers the proposed changes approved on September 4, 2020, if there are no comments. No comments were received.

## **PERMIT CONDITIONS**

In addition to the changes discussed in the “Background” section above, the following changes were made to the condition.

The diction in part 28 was corrected.

In part 26(b), the condition has been changed to add the CPM as a recipient of source test to match the wording of the condition as written by the California Energy Commission.

In part 26(b)(g), the details on the containers used for samples to determine the sulfur content of the fuel has been changed to match the wording of the condition as written by the California Energy Commission.

Part 35, which required the owner/operator to provide NOx emission credits, has been deleted since the offsets have been provided.

### **Permit Conditions:**

Condition 23688

### **Definitions:**

Clock Hour:	Any continuous 60-minute period beginning on the hour.
Calendar Day:	Any continuous 24-hour period beginning at 12:00 AM or 0000 hours.
Year:	Any consecutive twelve-month period of time
Heat Input:	All heat inputs refer to the heat input at the higher heating value (HHV) of the fuel, in BTU/scf.
Firing Hours:	Period of time, during which fuel is flowing to a unit, measured in fifteen-minute increments.
MM BTU:	million British thermal units
Gas Turbine Start-up Mode:	The lesser of the first 120 minutes of continuous fuel flow to the Gas Turbine after fuel flow is initiated or the period of time from Gas Turbine fuel flow initiation until the Gas Turbine achieves two consecutive CEM data points in compliance with the emission concentration limits of subparts 19(a) and 19(c) and is in compliance with the emission limits contained in subparts 19(a) and 19(c).



Gas Turbine Shutdown Mode: The lesser of the 30-minute period immediately prior to the termination of fuel flow to the Gas Turbine or the period of time from non-compliance with any requirement listed in subparts 19(a) through 19(d) until termination of fuel flow to the Gas Turbine

Corrected Concentration: The concentration of any pollutant (generally NO<sub>x</sub>, CO or NH<sub>3</sub>) corrected to a standard stack gas oxygen concentration. For a Gas Turbine emission point, the standard stack gas oxygen concentration is 15% O<sub>2</sub> by volume on a dry basis

~~Commissioning Activities (initial startup): All testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to insure safe and reliable steady state operation of the gas turbines, heat recovery steam generators, steam turbine, and associated electrical delivery systems.~~

~~Commissioning Period (initial startup): The Period shall commence when all mechanical, electrical, and control systems are installed and individual system start-up has been completed, or when a gas turbine is first fired following the installation of the duct burners and associated equipment, whichever occurs first. The period shall terminate when the plant has completed performance testing, is available for commercial operation, and has initiated sales of power to the grid. The Commissioning Period shall not exceed 180 days under any circumstances.~~

Alternate Calculation: A District approved calculation used to calculate mass emission data during a period when the CEM or other monitoring system is not capable of calculating mass emissions.

Precursor Organic Compounds (POCs): Any compound of carbon, excluding methane, ethane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate

**Equipment Description:**

1. This Authority to Construct is issued and is valid for this equipment only while it is in the configuration set forth in the following description:

Four Combined-Cycle Gas Turbine Generator Power Trains consisting of:

- a. Combustion Gas Turbine, General Electric LM6000PC, Maximum Heat Input 500 MMbtu/hr (HHV), 49.4 MW (nominal), Natural Gas-Fired

- b. Heat Recovery Steam Generator, equipped with low-NOx duct burners, 139 MMbtu/hour, Natural Gas Fired
- c. Selective Catalytic Reduction (SCR) NOx Control System.
- d. Ammonia Injection System.  
(including the ammonia storage tank and control system)
- e. Oxidation Catalyst (OC) System.
- f. Continuous emission monitoring system (CEMS) designed to continuously record the measured gaseous concentrations, and calculate and continuously monitor and record the NOx and CO concentrations in ppmvd corrected to 15% oxygen on a dry basis. The CEM shall also calculate, using District approved methods, and log any mass limits required by these conditions.

2. Clarke JW6H-UF40 fire pump and fire pump engine ~~or, at the owner/operator's option, either a 2012 or later model year John Deere Family CJDXL13.5103 or Cummins Family ACEXL0540AAB fire pump and fire pump engine, which Los Esteros may construct at its option to replace existing S5, Fire Pump Engine.~~

3. Six Cell Cooling Tower, ~~73,000-90,000~~ gallons per minute with drift eliminator of 0.0005% removal efficiency.

4. One spare Gas Turbine, General Electric LM6000PC, Maximum Heat Input 500 MMbtu/hr (HHV), 49.4 MW (nominal), Natural Gas-Fired

### **Permit Conditions:**

#### **Conditions for the Commissioning Period:**

1. ~~The owner/operator of the Los Esteros Critical Energy Facility shall minimize the emissions of carbon monoxide and nitrogen oxides from S1, S2, S3 and S4 Gas Turbines and S7, S8, S9, and S10 Heat Recovery Steam Generators to the maximum extent possible during the commissioning period. Parts 1 through 11 shall only apply during the commissioning period as defined above. Unless noted, parts 12 through 47 shall only apply after the commissioning period has ended. (basis: cumulative increase) Deleted Application 26518.~~
2. ~~At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the owner/operator shall tune the S1, S2, S3 and S4 Gas Turbine combustors to minimize the emissions of carbon monoxide and nitrogen oxides. (basis: cumulative increase) Deleted Application 26518.~~
3. ~~At the earliest feasible opportunity and in accordance with the recommendations of the equipment manufacturers and the construction~~

~~contractor, the owner/operator shall install, adjust and operate the SCR Systems (A10, A12, A14 & A16) and OC Systems (A9, A11, A13 & A15) to minimize the emissions of nitrogen oxides and carbon monoxide from S1, S2, S3 and S4 Gas Turbines and S7, S8, S9, and S10 Heat Recovery Steam Generators. (basis: cumulative increase) Deleted Application 26518.~~

- ~~4. Coincident with the steady-state operation of SCR Systems (A10, A12, A14 & A16) and OC Systems (A9, A11, A13 & A15) pursuant to part 3, the owner/operator shall operate the facility in such a manner that the Gas Turbines (S1, S2, S3 and S4) comply with the NO<sub>x</sub> and CO emission limitations specified in parts 19a and 19c. (basis: BACT, offsets) Deleted Application 26518.~~
- ~~5. The owner/operator of the Los Esteros Critical Energy Facility shall submit a plan to the District Permit Services Division at least two weeks prior to first firing of S1, S2, S3 & S4 Gas Turbines and/or S7, S8, S9, & S10 HRSGs describing the procedures to be followed during the commissioning of the turbines in the combined-cycle configuration. 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 water injection, the installation and operation of the required emission control systems, the installation, calibration, and testing of the CO and NO<sub>x</sub> continuous emission monitors, and any activities requiring the firing of the Gas Turbines (S1, S2, S3 and S4) without abatement by their respective SCR Systems. The Gas Turbines (S1, S2, S3 and S4) shall be fired in combined cycle mode no sooner than fourteen days after the District receives the commissioning plan. (basis: cumulative increase) Deleted Application 26518.~~
- ~~6. During the commissioning period, the owner/operator of the Los Esteros Critical Energy Facility shall demonstrate compliance with parts 8 through 10 through the use of properly operated and maintained continuous emission monitors and data recorders for the following parameters:
  - ~~a. firing hours~~
  - ~~b. fuel flow rates~~
  - ~~c. stack gas nitrogen oxide emission concentrations,~~
  - ~~d. stack gas carbon monoxide emission concentrations~~
  - ~~e. stack gas oxygen concentrations.~~~~
- ~~6. The monitored parameters shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation) for the S1, S2, S3 and S4 Gas Turbines and S7, S8, S9, and S10 Heat Recovery Steam Generators. The owner/operator shall use District-approved methods to calculate heat input rates, nitrogen dioxide mass emission rates, carbon monoxide mass emission rates, and NO<sub>x</sub> and CO emission concentrations, summarized for each clock hour and each calendar day. All records shall be retained on site for at least 5 years from the date of~~

~~entry and made available to District personnel upon request. If necessary to ensure that accurate data is collected at all times, the owner/operator shall install dual span emission monitors. (basis: cumulative increase) Deleted Application 26518.~~

7. ~~The owner/operator shall install, calibrate and make operational the District-approved continuous monitors specified in part 6 prior to first firing of each turbine (S1, S2, S3 and S4 Gas Turbines) and HRSG (S7, S8, S9, and S10 Heat Recovery Steam Generators). After first firing of the turbine, the owner/operator shall adjust the detection range of these continuous emission monitors as necessary to accurately measure the resulting range of CO and NOx emission concentrations. The type, specifications, and location of these monitors shall be subject to District review and approval. If necessary to ensure accurate data is collected at all times, the owner/operator shall install dual span monitors. (basis: BAAQMD 9-9-501, BACT, offsets) Deleted Application 26518.~~
8. ~~The owner/operator shall not operate the facility such that the number of firing hours of S1, S2, S3 and S4 Gas Turbines and/or S7, S8, S9, and S10 Heat Recovery Steam Generators without abatement by SCR or OC Systems exceeds 250 hours for each power train during the commissioning period. Such operation of the S1, S2, S3 and S4 Gas Turbines without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR or OC system in place. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 250 firing hours without abatement shall expire. (basis: offsets) Deleted Application 26518.~~
9. ~~The total mass emissions of nitrogen oxides, carbon monoxide, precursor organic compounds, PM<sub>10</sub>, and sulfur dioxide that are emitted by the S1, S2, S3 and S4 Gas Turbines and S7, S8, S9, and S10 Heat Recovery Steam Generators during the commissioning period shall accrue towards the consecutive twelve-month emission limitations specified in part 22. (basis: offsets) Deleted Application 26518.~~
10. ~~The owner/operator shall not operate the facility such that the pollutant mass emissions from each turbine (S1, S2, S3 and S4 Gas Turbines) and corresponding HRSG (S7, S8, S9, and S10 Heat Recovery Steam Generators) exceed the following limits during the commissioning period. These emission limits shall include emissions resulting from the start-up and shutdown of the S1, S2, S3 and S4 Gas Turbines.~~

	<u>Without Controls</u>		<u>With Controls</u>	
a. NO <sub>x</sub> (as NO <sub>2</sub> )	1464 lb/day	102 lb/hr	1464 lb/day	61 lb/hr
b. CO	1056 lb/day	88 lb/hr	984 lb/day	41 lb/hr
c. POC (as CH <sub>4</sub> )	288 lb/day		114 lb/day	

~~(basis: cumulative increase) Deleted Application 26518.~~

- ~~11. Within one hundred and twenty (120) days of startup, the owner/operator shall conduct a District approved source test using external continuous emission monitors to determine compliance with part 20. The source test shall determine NOx, CO, and POC emissions during start-up and shutdown of the gas turbines. The results of the source test must be submitted within 165 days of startup. The POC emissions shall be analyzed for methane and ethane to account for the presence of unburned natural gas. The source test shall include a minimum of three start-up and three shutdown periods. Thirty (30) days before the execution of the source tests, the owner/operator shall submit to the District a detailed source test plan designed to satisfy the requirements of this part. The owner/operator shall be notified of any necessary modifications to the plan within 20 working days of receipt of the plan; otherwise, the plan shall be deemed approved. The Owner/Operator shall incorporate the District comments into the test plan. The owner/operator shall notify the District within ten (10) days prior to the planned source testing date. Source test results shall be submitted to the District within 60 days of the source testing date. These results can be used to satisfy applicable source testing requirements in Part 26 below. (basis: offsets) [Deleted Application 26518.](#)~~
12. Consistency with Analyses: Operation of this equipment shall be conducted in accordance with all information submitted with the application (and supplements thereof) and the analyses under which this permit is issued unless otherwise noted below. (Basis: BAAQMD 2-1-403)
13. Conflicts Between Conditions: In the event that any part herein is determined to be in conflict with any other part contained herein, then, if principles of law do not provide to the contrary, the part most protective of air quality and public health and safety shall prevail to the extent feasible. (Basis: BAAQMD 1-102)
14. Reimbursement of Costs: All reasonable expenses, as set forth in the District's rules or regulations, incurred by the District for all activities that follow the issuance of this permit, including but not limited to permit condition implementation, compliance verification and emergency response, directly and necessarily related to enforcement of the permit shall be reimbursed by the owner/operator as required by the District's rules or regulations. (Basis: BAAQMD 2-1-303)
15. Access to Records and Facilities: As to any part that requires for its effective enforcement the inspection of records or facilities by representatives of the District, the Air Resources Board (ARB), the U.S. Environmental Protection Agency (U.S. EPA), or the California Energy Commission (CEC), the owner/operator shall make such records available or provide access to such facilities upon notice from representatives of the District, ARB, U.S. EPA, or CEC. Access shall mean access consistent with California Health and Safety Code Section 41510 and Clean Air Act Section 114A. (Basis: BAAQMD 1-440, 1-441)

16. Notification of Commencement of Operation: ~~— The owner/operator shall notify the District of the date of anticipated commencement of turbine operation not less than 10 days prior to such date. Temporary operations under this permit are granted consistent with the District's rules and regulations. (Basis: BAAQMD 2-1-302) Deleted Application 26518~~
17. Operations: The owner/operator shall insure that the gas turbines, HRSGs, emissions controls, CEMS, and associated equipment are properly maintained and kept in good operating condition at all times. (Basis: BAAQMD 2-1-307)
18. Visible Emissions: The owner/operator shall insure that no air contaminant is discharged from the LECEF into the atmosphere for a period or periods aggregating more than three minutes in any one hour, which is as dark as or darker than Ringelmann 1 or equivalent 20% opacity. (Basis: BAAQMD 6-1-301; SIP 6-301)
19. Emissions Limits: The owner/operator shall operate the facility such that none of the following limits are exceeded:
- a. The emissions of oxides of nitrogen (as NO<sub>2</sub>) from emission points P1, P2, P3, and P4 (combined exhaust of gas turbine/HRSG power trains S1 & S7, S2 & S8, S3 & S9, and S4 & S10, respectively) each shall not exceed 2.0 ppmvd @ 15% O<sub>2</sub> (1-hour rolling average), except during periods of gas turbine startup and shutdown as defined in this permit; and shall not exceed 4.68 lb/hour (1-hour rolling average) except during periods of gas turbine startup as defined in this permit. The NO<sub>x</sub> emission concentration shall be verified by a District-approved continuous emission monitoring system (CEMS) and during any required source test. (basis: BACT)
  - b. Emissions of ammonia from emission points P1, P2, P3, and P4 (combined exhaust of gas turbine/HRSG power trains S1 & S7, S2 & S8, S3 & S9, and S4 & S10, respectively) each shall not exceed 5 ppmvd @ 15% O<sub>2</sub> (3-hour rolling average), except during periods of start-up or shutdown as defined in this permit. The ammonia emission concentration shall be verified by the continuous recording of the ammonia injection rate, the NO<sub>x</sub> inlet emissions into the SCR control system, , the NO<sub>x</sub> outlet rate at the stack, and the total heat input of the combustion turbine and duct burner, using a District-approved ammonia slip calculation. (basis: Regulation 2, Rule 5)
  - c. Emissions of carbon monoxide (CO) from emission points P1, P2, P3, and P4 (combined exhaust of gas turbine/HRSG power trains S1 & S7, S2 & S8, S3 & S9, and S4 & S10, respectively) each shall not exceed 2.0 ppmvd @ 15 % O<sub>2</sub> (1-hour rolling average), except during periods of start-up or shutdown as defined in this permit; and shall not exceed 2.85 lb/hr (1-hour rolling average) except during periods of start-up as defined in this permit. The CO emission concentration shall be verified by a District-approved CEMS and during any required source test. (basis: BACT)

- d. Emissions of precursor organic compounds (POC) from emission points P1, P2, P3, and P4 (combined exhaust of gas turbine/HRSG power trains S1 & S7, S2 & S8, S3 & S9, and S4 & S10, respectively) each shall not exceed 1 ppmvd @ 15% O2 (1 clock hour average), except during periods of gas turbine start-up or shutdown as defined in this permit; and shall not exceed 0.81 lb/hr (1 clock hour average) except during periods of start-up as defined in this permit. The POC emission concentration shall be verified during any required source test. (basis: BACT)

20. Turbine Start-up: The project owner shall ensure that the regulated air pollutant mass emission rates from each of the Gas Turbines (S1, S2, S3, and S4) during a start-up do not exceed the limits established below. (Basis: BACT, Cumulative increase)

	Duration (Minutes)	NOx (lb/Event)	CO (lb/event)	POC (lb/event)
Start-Up	120	41	20	2

21. Turbine Shutdown: The project owner shall operate the gas turbines so that the duration of a shutdown does not exceed 30 minutes per event, or other time period based on good engineering practice that has been approved in advance by the BAAQMD. (Basis: Cumulative increase)

22. Mass Emission Limits: The project owner shall operate the LECEF so that the mass emissions from the S1, S2, S3 & S4 Gas Turbines and S7, S8, S9, & S10 HRSGs do not exceed the daily and annual mass emission limits specified below. The project owner shall implement process computer data logging that includes running emission totals to demonstrate compliance with these limits so that no further calculations are required.

Mass Emission Limits (Including Gas Turbine Start-ups and Shutdowns)

Pollutant	Each Turbine/HRSG Power Train (lb/day)	All 4 Turbine/HRSG Power Trains (lb/day)	All 4 Turbine/HRSG Power Trains (ton/yr)
NOx (as NO <sub>2</sub> )	175.6	702.4	94.1
POC	20.2	80.8	12.3
CO	97.0	388.0	53.4
SOx (as SO <sub>2</sub> )			6.43
PM <sub>10</sub>			38.5
NH <sub>3</sub>	104	416	56.9

The daily mass limits are based upon calendar day per the definitions section of the permit conditions. Compliance with the daily limits shall be based on one-hour readings through the use of process monitors (e.g., fuel use meters), CEMS, source test results, and the monitoring, recordkeeping and reporting conditions of this permit. If any part of a CEM or parametric monitor involved in the mass emission calculations is inoperative for more than a clock hour of plant operation, the mass data for the period of inoperation shall be calculated using a District-approved alternate calculation method. The annual mass limits are based upon a rolling 12 calendar month period. Compliance with the annual limits for NOx, POC, and CO shall be demonstrated in the same manner as for the daily limits. Compliance with the daily and annual emissions limits for POC from each gas turbine/HRSG train shall be calculated by multiplying turbine and HRSG fuel usage times an emission factor determined by source testing of the turbine/HRSG conducted in accordance with part 26. Compliance with the annual emissions limits for PM<sub>10</sub> and SO<sub>2</sub> from each gas turbine/HRSG shall be calculated by multiplying turbine/HRSG fuel usage times an emission factor determined by source testing of the turbine/HRSG conducted in accordance with Part 26. The emission factor for each turbine shall be based on the average of the emissions rates observed during the 4 most recent source tests on that turbine/HRSG (or, prior to the completion of 4 source tests on a turbine/HRSG, on the average of the emission rates observed during all source tests on the turbine/HRSG). (Basis: cumulative increase, recordkeeping)

23. Sulfuric Acid Mist Limit: The project owner shall operate the LECEF so that the sulfuric acid mist emissions (SAM) from S1, S2, S3, S4, S7, S8, S9, ~~and S10, and S14~~ combined do not exceed 7 tons totaled over any consecutive four quarters. (Basis: Regulation 2-2-306)

24. Operational Limits: In order to comply with the mass emission limits of this rule, the project owner shall operate the gas turbines and HRSGs so that they comply with the following operational limits:

a. Heat input limits (Higher Heating Value):

	Each Gas Turbine w/o Duct Burner	Each Gas Turbine w/Duct Burner
Hourly:	500 MMbtu/hr	639 MMbtu/hr
Daily:	12,000 MMbtu/day	15,336 MMbtu/day
Four Turbine/HRSG Power Trains combined:		18,215,000 MMbtu/year

b. Only PUC-Quality natural gas (General Order 58-a) shall be used to fire the gas turbines and HRSGs. The total sulfur content of the natural gas



shall not exceed 1.0 gr/100 scf. To demonstrate compliance with this sulfur content limit, the owner/operator shall use the quarterly sulfur data on PG&E's website except during any source tests. ~~sample and analyze the gas from each supply source at least monthly to determine the sulfur content of the gas, in addition to any monitoring requirements specified in part 29. The owner/operator may obtain the data from each source of natural gas monthly. In this case, the data must be real data based on actual sulfur analyses performed by the supplier of natural gas and not assurances that the natural gas meets all specifications. If the owner/operator uses data obtained from the source of the natural gas, then the data must demonstrate that the sulfur content is below 1.0 gr/100 scf for each day of the month the facility is in operation. (Basis: BACT for SO<sub>2</sub> and PM<sub>10</sub>.)~~

- c. The owner/operator of the gas turbines and HRSGs shall demonstrate compliance with the daily and annual NO<sub>x</sub> and CO emission limits listed in part 22 by maintaining running mass emission totals based on CEM data. (Basis: Cumulative increase)

25. Monitoring Requirements: The owner/operator shall ensure that each gas turbine/HRSG power train complies with the following monitoring requirements:

- a. The gas turbine/HRSG exhaust stack shall be equipped with permanent fixtures to enable the collection of stack gas samples consistent with EPA test methods.
- b. The ammonia injection system shall be equipped with an operational ammonia flow meter accurate to plus or minus five percent at full scale, which shall be calibrated at least once every twelve months, and an injection pressure indicator.
- c. The gas turbine/HRSG exhaust stacks shall be equipped with continuously recording emissions monitor(s) for NO<sub>x</sub>, CO and O<sub>2</sub>. Continuous emissions monitors for CO shall comply with the requirements of 40 CFR Part 60, Appendices B and F. Continuous emissions monitors for NO<sub>x</sub> and O<sub>2</sub> shall comply with the requirements of 40 CFR Part 75. All CO, NO<sub>x</sub>, and O<sub>2</sub> monitors shall be capable of monitoring concentrations and mass emissions during normal operating conditions and during gas turbine startups and shutdowns.
- d. The fuel heat input rate shall be continuously recorded using District-approved fuel flow meters along with quarterly fuel compositional analyses for the fuel's higher heating value (wet basis).

26. a. RATA: ~~Within one hundred and twenty (120) days of the initial startup of the gas turbines and HRSGs, and at a minimum~~ On an annual basis thereafter, the owner/operator shall perform a relative accuracy test audit (RATA) on the CO CEM in accordance with 40 CFR Part 60, Appendix B,

Performance Specifications, and on the NO<sub>x</sub> and O<sub>2</sub> CEMs in accordance with 40 CFR 75.

b. Source Testing: A source test shall be performed on each power train every 8,000 hours of operation or every three years, whichever is sooner. However, if a power train is not operating when the period has expired, the source test may be postponed until the power train starts up again. Additional source testing may be required at the discretion of the District to address or ascertain compliance with the requirements of this permit. The written test results of the source tests shall be provided to the District and the CPM within sixty days after testing. A complete test protocol shall be submitted to the District no later than 30 days prior to testing, and notification to the District at least ten days prior to the actual date of testing shall be provided so that a District observer may be present. The source test protocol shall comply with the following: measurements of NO<sub>x</sub>, CO, POC, and stack gas oxygen content shall be conducted in accordance with ARB Test Method 100; measurements of PM<sub>10</sub> shall be conducted in accordance with ARB Test Method 5; and measurements of ammonia shall be conducted in accordance with Bay Area Air Quality Management District test method ST-1B. Alternative test methods, and source testing scope, may also be used to address the source testing requirements of the permit if approved in advance by the District. The ~~initial and~~ periodic source tests shall be conducted to show compliance with parts 19(a), 19(b), 19(c) and 19(d), and shall include those parameters specified in the approved test protocol, and shall at a minimum include the following:

- a. NO<sub>x</sub> – ppmvd at 15% O<sub>2</sub>, lb/MMbtu, and lb/hr (as NO<sub>2</sub>)
- b. Ammonia – ppmvd at 15% O<sub>2</sub> (Exhaust)
- c. CO – ppmvd at 15% O<sub>2</sub>, lb/MMbtu, and lb/hr (Exhaust)
- d. POC – ppmvd at 15% O<sub>2</sub>, lb/MMbtu, and lb/hr (Exhaust)
- e. PM<sub>10</sub> – lb/hr (Exhaust)
- f. SO<sub>x</sub> – lb/hr (~~based on sulfur content of fuel as measured by utility~~)
- g. Natural gas consumption, fuel High Heating Value (HHV), and total fuel sulfur content (Based on analysis of sample obtained during source test. The owner/operator shall obtain prior approval for the type of container used to transport the sample to the laboratory.) The owner/operator shall use Summa canisters with an inner coating of Silcosteel or Sulfinert or a District approved equivalent for the sample.
- h. Turbine load in megawatts
- i. Stack gas flow rate (DSCFM) calculated according to procedures in U.S. EPA Method 19
- j. Exhaust gas temperature (°F)
- k. Ammonia injection rate (lb/hr or moles/hr)
- l. Water injection rate for each turbine at S1, S2, S3, & S4

(Basis: source test requirements & monitoring)

27. ~~Within 120 days of start-up of the LECEF in combined cycle configuration and~~  
~~On a semi-annual basis thereafter, Every 8,000 hours of operation or every~~  
~~three years, whichever is sooner, the project owner/operator shall conduct a~~  
District approved source test on exhaust points P1, P2, P3, and P4 while each  
Gas Turbine/HRSG power train is operating at maximum load to demonstrate  
compliance with the SAM emission limit specified in part 23. However, if a  
power train is not operating when the test is required, the source test may be  
postponed until the power train starts up again. Subsequent Source tests  
must be submitted within 60 days of the date of the source test. The  
owner/operator shall test for SO<sub>3</sub> evaluated as H<sub>2</sub>SO<sub>4</sub> and sulfuric acid mist  
(SAM). ~~After acquiring one year of source test data on these units, the~~  
~~owner/operator may petition the District to switch to annual source testing if test~~  
~~variability is acceptably low as determined by the District.~~ (Basis: Regulation  
2-2-306, SAM Periodic Monitoring)
28. The owner/operator shall prepare a written quality assurance program, which  
must be established in accordance with 40 CFR Part 75, Appendix B and 40  
CFR Part 60, Appendix F. (Basis: continuous emission monitoring)
29. deleted
30. The owner/operator shall notify the District of any breakdown condition  
consistent with the District's breakdown regulations. (Basis: Regulation 1-  
208)
31. The owner/operator shall notify the District in writing in a timeframe  
consistent with the District's breakdown regulations following the correction  
of any breakdown condition. The breakdown condition shall include a  
description of the equipment malfunction or failure, the date and cause of the  
initial failure, the estimated emissions in excess of those allowed, and the  
actions taken to restore normal operations. (Basis: Regulation 1-208)
32. Recordkeeping: The owner/operator shall maintain the following  
records. The format of the records is subject to District review and approval:
- hourly, daily, quarterly and annual quantity of fuel used and corresponding  
heat input rates
  - the date and time of each occurrence, duration, and type of any startup,  
shutdown, or malfunction along with the resulting mass emissions during  
such time period
  - emission measurements from all source testing, RATAs and fuel analyses
  - daily, quarterly and annual hours of operation
  - hourly records of NO<sub>x</sub> and CO emission concentrations and hourly  
ammonia injection rates and ammonia/NO<sub>x</sub> ratio
  - for the continuous emissions monitoring system: evaluations, calibrations,  
checks, maintenance, adjustments, and any period of non-operation of  
any continuous emissions monitor

(Basis: record keeping)

33. The owner/operator shall maintain all records required by this permit for a minimum period of five years from the date of entry and shall make such records readily available for District inspection upon request. (Basis: record keeping)
34. Reporting: The owner/operator shall submit to the District a written report for each calendar quarter, within 30 days of the end of the quarter, which shall include all of the following items:
  - a. Daily and quarterly fuel use and corresponding heat input rates
  - b. Daily and quarterly mass emission rates for all criteria pollutants during normal operations and during other periods (startup/shutdown, breakdowns)
  - c. Time intervals, date, and magnitude of excess emissions
  - d. Nature and cause of the excess emission, and corrective actions taken
  - e. Time and date of each period during which the CEM was inoperative, including zero and span checks, and the nature of system repairs and adjustments
  - f. A negative declaration when no excess emissions occurred
  - g. ~~Results of quarterly fuel analyses for HHV and total sulfur content.~~Quarterly sulfur as reported by PG&E

(Basis: recordkeeping & reporting)

35. ~~Emission Offsets: The project owner shall provide 23.35 tons of valid NOx emission reduction credits prior to the issuance of the Authority to Construct. The owner/operator shall deliver the ERC certificates to the District Engineering Division at least ten days prior to the issuance of the authority to construct. (Basis: Offsets)~~Deleted Application 26518
36. District Operating Permit: The owner/operator shall apply for and obtain all required operating permits from the District in accordance with the requirements of the District's rules and regulations. (Basis: Regulation 2, Rules 2 & 6)
37. Deleted
38. Deleted June 22, 2004.
39. The project owner shall not operate S5 Fire Pump Diesel Engine more than 50 hours per year for reliability-related activities. (Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(A)(3) or (e)(2)(B)(3), offsets).
40. The project owner shall operate S5 Fire Pump Diesel Engine only for the following purposes: to mitigate emergency conditions, for emission testing to demonstrate compliance with a District, state or Federal emission limit, or for reliability-related activities (maintenance and other testing, but excluding emission testing). Operating hours while mitigating emergency conditions or while emission testing to show compliance with District, state or Federal

- emission limits is not limited. (Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(A)(3) or (e)(2)(B)(3)).
41. The project owner shall operate S5 Fire Pump Diesel Engine only when a non-resettable totalizing meter (with a minimum display capability of 9,999 hours) that measures the hours of operation for the engine is installed, operated and properly maintained. (Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(4)(G)(1), cumulative increase).
  42. Records: The project owner shall maintain the following monthly records in a District-approved log for at least 60 months from the date of entry. Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request.
    - a. Hours of operation for reliability-related activities (maintenance and testing).
    - b. Hours of operation for emission testing to show compliance with emission limits.
    - c. Hours of operation (emergency).
    - d. For each emergency, the nature of the emergency condition.
    - e. Fuel usage for each engine(s). (Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(4)(I), cumulative increase)
  - \*43. The project owner shall operate the facility such that maximum calculated annual toxic air contaminant emissions (pursuant to part 45) from the gas turbines and HRSGs combined (S1, S2, S3, S4, S7, S8, S9, and S10) do not exceed the following limits:
    - 6490 pounds of formaldehyde per year
    - 3000 pounds of acetaldehyde per year
    - 3.2 pounds of Specified polycyclic aromatic hydrocarbons (PAHs) per year
    - 65.3 pounds of acrolein per yearunless the following requirement is satisfied:

The project owner shall perform a health risk assessment using the emission rates determined by source test and the most current Bay Area Air Quality Management District approved procedures and unit risk factors in effect at the time of the analysis. This analysis shall be submitted to the District and the CEC CPM within 60 days of the source test date. The project owner may request that the District and CEC CPM revise the carcinogenic compound emission limits specified above. If the project owner demonstrates to the satisfaction of the APCO that these revised emission limits will result in a cancer risk of not more than 1.0 in one million, the District and CEC CPM may, at their discretion, adjust the carcinogenic compound emission limits listed above. (Basis: Regulation 2, Rule 5)

44. To demonstrate compliance with Part 43, after each source test performed pursuant to part 43, the project owner shall calculate and record the maximum projected annual emissions for the compounds specified in part 43 using the maximum heat input of 18,215,000 MMbtu/year and the highest emission factor (pound of pollutant per MMbtu) determined by any source test of the S1, S2, S3 & S4 Gas Turbines and S7, S8, S9, and S10 HRSGs. If this calculation method results in an unrealistic mass emission rate the applicant may use an alternate calculation, subject to District approval. (Basis: Regulation 2, Rule 5)

~~45. Within 120 days of initial start-up of the Los Esteros Critical Energy Facility and~~ On a biennial (once every two years) basis thereafter, the project owner shall conduct a District-approved source test at exhaust point P1, P2, P3, or P4 while the Gas Turbines are at maximum allowable operating rates to demonstrate compliance with Part 44. The results of the initial source test must be submitted within 165 days of startup. Subsequent source tests must be submitted within 60 days of the date of the source test. If three consecutive biennial source tests demonstrate that the annual emission rates for any of the compounds listed above calculated pursuant to part 45 are less than the BAAQMD Toxic Risk Management Policy trigger levels shown below, then the owner/operator may discontinue future testing for that pollutant.

Formaldehyde	<	132 lb/yr
Acetaldehyde	<	288 lb/yr
Specified PAHs	<	0.18 lb/yr
Acrolein	<	15.6 lb/yr

(Basis: BAAQMD 2-1-316, Regulation 2, Rule 5)

46. The project owner shall properly install and maintain the cooling towers to minimize drift losses. The owner/operator shall equip the cooling towers with high-efficiency mist eliminators with a maximum guaranteed drift rate of 0.0005%. The maximum total dissolved solids (TDS) measured at the base of the cooling towers or at the point of return to the wastewater facility shall not be higher than 6,000 ppmw (mg/l). The project owner shall sample and test the cooling tower water at least once per day to verify compliance with this TDS limit. (Basis: cumulative increase; Regulation 2-1-319)

47. The owner/operator shall perform a visual inspection of the cooling tower drift eliminators at least once per calendar year, and repair or replace any drift eliminator components which are broken or missing. ~~Prior to the initial operation of the combined cycle Los Esteros Critical Energy Facility, the owner/operator shall have the cooling tower vendor's field representative inspect the cooling tower drift eliminators and certify that the installation was performed in accordance with the manufacturer's design and specifications. Within 60 days of the initial operation of the cooling tower, the owner/operator shall perform an initial performance source test to determine the PM<sub>10</sub> emission rate from the cooling tower to verify compliance with the~~

~~vendor-guaranteed drift rate specified in part 46.~~ The CPM may, in years 5 and 15 of cooling tower operation, require the owner/operator to perform source tests to verify continued compliance with the vendor-guaranteed drift rate specified in part 46. The owner/operator shall ensure that the throughput at S11 does not exceed 90,000 gal/min. (Basis: cumulative increase; Regulation 2-1-319)

48. S14 is a GE LM6000 turbine that is equivalent to the existing gas turbines and is used as a substitute when one of the existing turbines is being maintained. The owner/operator may substitute S14, Combustion Gas Turbine #5 into any of the four power trains at any time (S1/S7, S2/S8, S3/S9, and S4/S10). The owner/operator shall ensure that the power train operating with S14 complies with all permit conditions for that power train. The owner/operator shall operate no more than four turbines at any time. (Basis: Cumulative Increase)

## RECOMMENDATION

It is recommended that a change in conditions for the following equipment be granted for the following sources:

- S1 Combustion Gas Turbine #1, 500 MMbtu/hr
- S2 Combustion Gas Turbine #2, 500 MMbtu/hr
- S3 Combustion Gas Turbine #3, 500 MMbtu/hr
- S4 Combustion Gas Turbine #4, 500 MMbtu/hr
- S7 Heat Recovery Steam Generator #1, 139 MMbtu/hr
- S8 Heat Recovery Steam Generator #2, 139 MMbtu/hr
- S9 Heat Recovery Steam Generator #3, 139 MMbtu/hr
- S10 Heat Recovery Steam Generator #4, 139 MMbtu/hr
- S11 Six-cell Cooling Tower
- S14, Combustion Gas Turbine, 500 MMbtu/hr

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Brenda Cabral  
Supervising Engineer

## Appendix A, PG&E Responses to Questions on Sulfur Monitoring



**PACIFIC GAS AND ELECTRIC COMPANY  
Gas Operations Data Response**

PG&E Data Request Index No.:	12055		
Request Date:	05-08-2018	Date Sent:	06-14-2018
Requesting Party:	Government Relations		
External Requester:	Gerry Bemis, California Energy Commission	PG&E Contact:	Vasilis Siskos

**QUESTION 12055.01:** Exactly where are these samples obtained (i.e., where are the “delivery points” mentioned in the response below)?

**RESPONSE 12055.01:** These online sulfur chromatographs are located at PG&E’s Topock Compressor Station (CS), Hinkley CS, Burney CS, and at the Gill Ranch, Questar, McDonald Island, Lodi Sherman Island, Lodi Kirby Hills, Los Medanos, Wild Goose Gridley, and Wild Goose Delevan interconnects. Additionally, PG&E receives live total sulfur data from GTN and Ruby Pipeline from their online sulfur analyzers.

**QUESTION 12055.02:** Can we get data for individual sites, and if so, are they near CEC-licensed Bay Area power plants (Los Medonas, Metcalf, Delta, Russell City, Los Esteros)?

**RESPONSE 12055.02:** PG&E has data for the sulfur chromatograph locations listed in Response 12055.01. This data is updated regularly and PG&E can provide it upon request for the specific locations and time frames. Additionally, PG&E can only provide estimates of the sulfur content of the gas feeding the CEC-licensed power plants from the data we already collect from other locations as we do not have our own sulfur analyzers located at any of the CEC-licensed Bay Area power plants.

**QUESTION 12055.03:** Why are these data “unavailable” for Q2 of 2010 and Q4 of 2009, and are there likely to be future quarters with unavailable data?

**RESPONSE 12055.03:** PG&E believes some of the sulfur analyzers were most likely out of service during these quarters. PG&E does not expect to have unavailable data during future quarters.

**QUESTION 12055.04:** What is the timing of these quarterly tests (are they collected on same day at each site, or different days)? One of your responses below says you measure the sulfur content “continuously”. How are quarterly data obtained from these continuous measurements?

**RESPONSE 12055.04:** PG&E performs quarterly tests on the gas supplied to PG&E’s power plants, specifically at the Colusa Generating Plant and Contra Costa Power Plant. These tests are separate from the continuous measurements conducted at the locations listed in Response 12055.01 and are used to verify that the gas delivered to PG&E is compliant with our gas quality standards.

**QUESTION 12055.05:** How many sites are tested, and does the number of sites tested vary from quarter to quarter?

**RESPONSE 12055.05:** See Response 12055.04.

**QUESTION 12055.06:** You mention that California production accounts for only about 1% of your overall supply. However, for individual power plants located near that California production (i.e., Delta), the in-state contribution could be a larger fraction of the fuel received at that power plant. Correct?

**RESPONSE 12055.06:** Yes, for individual power plants located near that California production, the in-state contribution could be a larger fraction of the fuel received at that power plant.

**PACIFIC GAS AND ELECTRIC COMPANY  
Gas Operations Data Response**

PG&E Data Request Index No.:	12124		
Request Date:	05-29-2018	Date Sent:	06-12-2018
Requesting Party:	Government Relations		
External Requester:	Gerry Bemis, California Energy Commission	PG&E Contact:	Vasilis Siskos

**QUESTION 12124.01:** What is the methodology used by PG&E to measure the sulfur content and how is this done continuously?

**RESPONSE 12124.01:** The individual sulfur compounds are measured using a gas chromatograph which is manufactured by Medor and is specifically designed to measure the concentrations of these compounds in natural gas.

**QUESTION 12124.02:** When looking at the data reported by the Calpine facilities, there seems to be a lot of variability that is not showing up in PG&E data.

**RESPONSE 12124.02:** PG&E cannot speak to the variability in data reported by the Calpine facilities without seeing the data and learning about the type of instrument used for its analysis.