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CEC-57 (Revised 1/19)

STATEMENT OF STAFF APPROVAL OF PROPOSED CHANGE

POST-CERTIFICATION PROJECT CHANGE
LOS ESTEROS CRITICAL ENERGY FACILITY
(03-AFC-02C)

On August 22, 2018, Los Esteros Critical Energy Facility, LLC (project owner), filed a petition (TN #: 224569) for a post-certification change with the California Energy Commission (CEC). The petition requests changes to the Los Esteros Critical Energy Facility Phase 2 (LECEF) Final Decision (Decision) conditions of certification (COCs) to increase the water circulation rate through the cooling tower and amend the air quality COCs to align with the Bay Area Air Quality Management District (BAAQMD) Title V Operating Permit.

LECEF is a combined-cycle, natural gas-fired, 320-megawatt (MW) facility, located in north San Jose at 800 Thomas Foon Chew Way. The site is bounded by State Route 237 on the south side, Zanker Road on the west, and Coyote Creek on the east, within the City of San Jose, California. The project was certified in two phases by the CEC, the first phase in July 2002, began commercial operation in March 2003. The second phase was approved by the CEC in October 2006 and began commercial operation on August 9, 2013.

CEC staff reviewed the petition pursuant to Title 20, California Code of Regulations, section 1769 (Post Certification Amendments and Changes) and concluded that the requested 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 (LORS).

DESCRIPTION OF PROPOSED CHANGES

The changes proposed in this petition include the following:

- An increase in the water circulation rate through the cooling tower from 73,000 gallons per minute (GPM) up to 90,000 GPM. The increased GPM rate is to optimize the current cooling tower design and increase the circulation rate to the design capacity.
- Changes to air quality conditions of certification in the CEC Decision to alignthem with the BAAQMD's proposed Title V Operating Permit and to delete provisions associated with initial compliance testing and monitoring for the periods immediately following facility commissioning, where these conditions are no longer applicable.

The Energy Commission's webpage for this facility, https://ww2.energy.ca.gov/sitingcases/losesteros2/index.html, has a link to the petition and the Staff Analysis.

ENERGY COMMISSION STAFF REVIEW AND CONCLUSIONS

Title 20, California Code of Regulations, section 1769 states that a project owner shall petition the CEC for approval of any change it proposes to the project design, operation, or performance requirements.

CEC staff reviewed the petition for potential environmental effects and consistency with applicable LORS. Staff has concluded that the following technical areas are not affected by the proposed changes: Biological Resources, Cultural Resources, Facility Design, Land Use, Noise and Vibration, Traffic and Transportation, Efficiency, Geological and Paleontological Resources, Hazardous Materials Management, Public Health, Reliability, Socioeconomics, Transmission Line Safety and Nuisance, Transmission System Engineering, Worker Safety and Fire Protection, and Waste Management.

In the technical areas of Air Quality, Soil and Water Resources and Visual Resources, staff has concluded that impacts on the environment are less than significant and the project would remain in compliance with all applicable LORS with the continued implementation of existing conditions of certification in the CEC Decision. In addition,Air Quality staff recommended adoption of modified conditions of certification to continue to comply with all applicable BAAQMD rules and regulations. The changes would not cause the project to fail to comply with any applicable LORS. The project change would not affect any population including the environmental justice population as shown in **Environmental Justice Figure 1, Figure 2**, and **Table 1**.

NECESSITY FOR THE PROPOSED CHANGES

The requested changes would modify the water throughput rate of the LECEF Phase 2 cooling tower up to 90,000 gallons per minute (GPM). The facility was installed with pumps rated at 90,000 GPM but is currently operating at the 73,000 GPM circulation rate identified by the Authority to Construct Renewal. The purpose of the modification is to optimize the current cooling tower design and increase the circulation rate to the design capacity. There is no physical modification necessary to achieve an increase in the circulation rate.

The petition also seeks to align theairquality conditions with the proposed New Source Review (NSR) and Title V Operating Permits issued by BAAQMD. Originally, the project owner proposed to modify Conditions of Certification AQ-19, AQ-19c, AQ-19d, AQ-25b, and AQ-26 to align these conditions of certification with the NSR and Title V Operating Permit requirements for the facility. The project owner also proposes to modify certain definitions and additional conditions as reflected in the NSR and Title V Operating Permit definitions. After the petition was filed with the CEC, and upon further review byCECand BAAQMD staff, additional Air Quality COC changes were determined to be necessary that went beyond what the original petition had requested. These additional changes were necessary because those requested by the project owner and shown above had affected other Air Quality

conditions of certification that were not anticipated by the project owner in the original request.

The change proposes to delete provisions associated with initial compliance testing and monitoring for the periods immediately following facility commissioning, where these conditions are no longer applicable. The following air quality staff conditions all contain language associated with initial compliance testing following the post-construction commissioning activities when LECEF went online in 2013. Thus, the following permit conditions that require initial plant startup testing are no longer needed and can be marked as

"Deleted per Amendment":

- AQ-1
- AQ-2
- AQ-3
- AQ-4
- AQ-5
- AQ-6
- AQ-7
- AQ-8
- AQ-9
- AQ-10
- AQ-11

Additional modifications to the Air Quality conditions of certification were necessary since the petition was originally docketed due to interactions between the facility project owner and BAAQMD. These were further evaluated by CEC and BAAQMD staff to reflect the current Title V regulation requirements:

- AQ-SC7
- AQ-16
- AQ-19(d)
- AQ-23 adding (S14)
- AQ-24(b)
- AQ-26(a)
- AQ-26(b)
- AQ-27
- AQ-34(g)
- AQ-43
- AQ-35
- AQ-40
- AQ-45
- AQ-47 (adding S11)

None of these changes are based on information known by the project ownerduring the certification proceeding.

STAFF'S ASSESSMENT OF THE PROPOSED AMENDMENT

CEC staff reviewed the petition for potential environmental effects and consistency with applicable LORS. A summary of staff's conclusions reached for each affected technical area is summarized below.

Staff concludes the following for the technical areas affected by the proposed changes:

- **Air Quality.** Staff has reviewed a draft engineering evaluation from the BAAQMD for the project's proposed Title V permit, and the project would comply with all applicable BAAQMD rules and regulations. The final BAAQMD permit for the project is not yet available; however, the final permit is expected to be finalized by BAAQMD after the CEC renders a decision on this petition. This change would not have a significant effect on the environment.

  With the adoption of the modified conditions of certification recommended by staff in this staff analysis, the project is expected to continue to comply with all applicable BAAQMD rules and regulations. The change would not cause the project to fail to comply with any applicable LORS.

  The project changes would result in a small increase in PM_{10} emissions; however, the facility's actual emissions are far less than the PM_{10} potential to emit (PTE). Therefore, the small emissions increase from the proposed change would not result in any increases indaily, quarterly, annual, or other emission limits because the facility's actual emissions would still be well below the PM_{10} emission limits.

  These changes to the air quality conditions of certification can be approved as staff-approved changes per Title 20, California Code of Regulations, section 1769(a)(3)(A) and (B).

- **Public Health**. Staff has analyzed potential public health risks associated with the changes proposed in the LECEF's petition. Staff does not expect any significant adverse cancer, short-term, or long-term health effects on any members of the public, including low income and minority populations, from the project's toxic emissions. Staff also concludes that there is no need to add or change any Public Health condition of certification and that LECEF would remain in compliance with all applicable LORS.

- **Soil and Water Resources**. The currently permitted pump system already has the capacity to supply water circulation at the increased proposed rate. Therefore, there

would be no physical modifications at the facility in order to achieve the increase in the circulation rate.

LECEF uses recycled water for industrial purposes. The recycled water is supplied from the South Bay Water Recycling (SBWR) Program in the city of San Jose. SBWR has not placed any restrictions on LECEF that would prohibit the proposed increase in use. Use of recycled water for industrial purposes is encouraged consistent with CECwater policy. Also, the San Jose/Santa Clara Water Pollution Control Plant has not placed any restrictions on LECEF that would prohibit disposal of the proposed increase or change in quality of the wastewater discharge (LECEF 2018b).

Staff reviewed the project's conditions of certification and found that none of the conditions would require modification as a result of the proposed change. The project will also continue to report its water use in an annual summary, which will include the monthly range and monthly average of daily usage in gallons per day, and total water used by the project on a monthly and annual basis in acre-feet, in accordance with Condition of Certification SOIL&WATER-6.

- **Visual Resources**. Staff reviewed the frequency fogging curve information associated with a 73,000 GPM circulation rate, as originally adopted in the CEC Decision.

  With the cooling tower plume abatement on, visible plume frequencies are expected to be reduced. As depicted in Figures 1 and 2 more extreme weather conditions would be necessary in order for a visible plume to form with the increase in cooling tower recirculating rate. Staff concludes the project would continue to comply with VIS-6, and this condition requires no modification.

ENVIRONMENTAL JUSTICE

Environmental Justice Figure 1 shows 2010 census blocks in the six-mile radius of the LECEF site with a minority population greater than or equal to 50 percent. The population in these census blocks represents an environmental justice (EJ) population based on race and ethnicity as defined in the United States Environmental Protection Agency's *Guidance on Considering Environmental Justice During the Development of Regulatory Actions*. Staff conservatively obtains demographic data within a six-mile radius around a project site based on the parameters for dispersion modeling used in staff's air quality analysis. Air quality impacts are generally the type of project impacts that extend the furthest from a project site. Beyond a six-mile radius, air emissions have either settled out of the air column or mixed with surrounding air to the extent the potential impacts are less than significant. The area of potential impacts would not extend this far from the project site for most other technical areas included in staff's EJ analysis.

Based on California Department of Education data in the **Environmental Justice – Table 1**,staff concluded that the percentage of those living in the Orchard Elementary, San Jose Unified, and Santa Clara Unified school districts (in a six-mile radius of the project site) and enrolled in the free or reduced price meal programs are larger than those in the reference geographies, and thus are considered an EJ population based on low income as defined in *Guidance on Considering Environmental Justice During the Development of Regulatory Actions*. **Environmental Justice – Figure 2** shows where the boundaries of the school districts are in relation to the six-mile radius around the LECEF site.

Environmental Justice – Table 1
Low Income Data within the Project Area

SCHOOL DISTRICTS IN SIX-MILE RADIUS	Enrollment Used for Meals	Free or Reduced Price Meals	
Berryessa Union Elementary	7,102	2,459	34.6%
Milpitas Unified	10,318	3,452	33.5%
Orchard Elementary	875	442	50.5%
San Jose Unified	31,713	14,479	45.7%
Santa Clara Unified	15,509	6,402	41.3%
Sunnyvale	6,575	2,282	34.7%
REFERENCE GEOGRAPHY			
Santa Clara County	272,155	102,647	33.5%
Fremont Unified	35,777	6,692	18.7%
REFERENCE GEOGRAPHY			
Alameda County	228,361	100,280	43.9%
Source: CDE 2018. California Department of Education, DataQuest, Free or Reduced Price Meals, District level data for the year 2017-2018, <http://dq.cde.ca.gov/dataquest/>.			

The following technical areas (if affected by a project change) consider impacts to EJ populations: Air Quality, Cultural Resources (indigenous people), Hazardous Materials Management, Land Use, Noise and Vibration, Public Health, Socioeconomics, Soil and Water Resources, Traffic and Transportation, Transmission Line Safety and Nuisance, Visual Resources, Waste Management, and Worker Safety and Fire Protection.

ENVIRONMENTAL JUSTICE CONCLUSIONS

For the technical areas of Hazardous Materials Management, Land Use, Noise and Vibration, Public Health, Socioeconomics, Soil and Water Resources, Traffic and Transportation, Transmission Line Safety and Nuisance, Visual Resources, Waste Management, and Worker Safety and Fire Protection, staff concludes that impacts would be less than significant, and

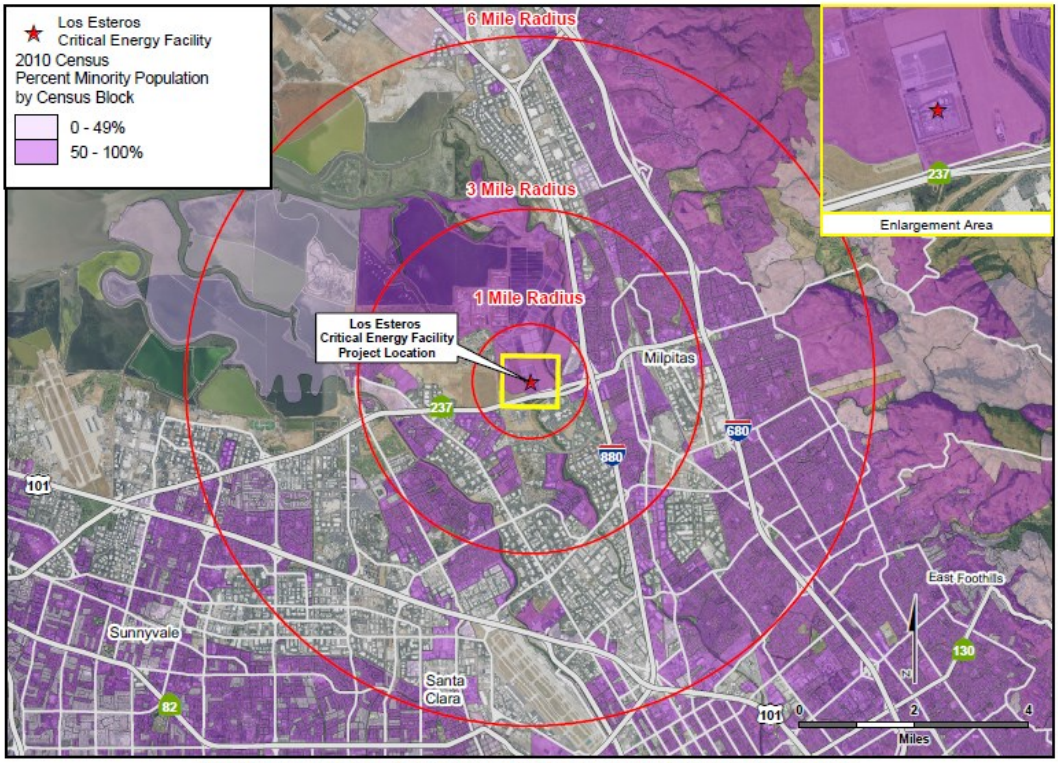
thus would be less than significant on the EJ population represented in **Environmental Justice Figure 1**, **Figure 2**, and **Table 1**.

For Cultural Resources (indigenous people), staff reviewed the ethnographic and historic literature to determine whether any EJ populations use or reside in the project area. No known hunting and gathering areas would be impacted by the proposed project change, therefore Native Americans are not considered members of the EJ population in the project area.

In the technical areas of Air Quality, Soil and Water Resources and Visual Resources, staff has concluded that impacts on the environment are less than significant and the project would remain in compliance with all applicable LORS with the continued implementation of existing conditions of certification in the CEC Decision. In addition,Air Quality staff recommended adoption of modified conditions of certification to continue to comply with all applicable BAAQMD rules and regulations. Staff has determined that by adopting the proposed changes to the existing conditions of certification, the project change would not cause significant air quality impacts for any population in the project's six-mile radius, including the EJ population as shown in **Environmental Justice Figure 1, Figure 2**, and **Table 1**.

ENVIRONMENTAL JUSTICE - FIGURE 1

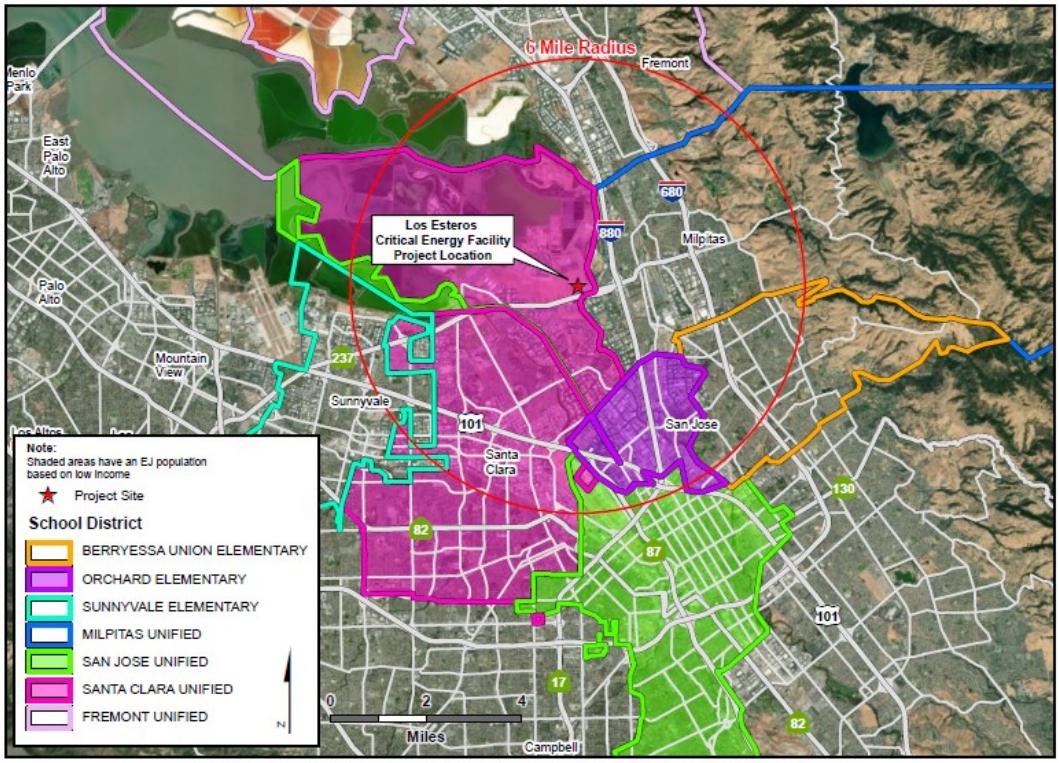
Los Esteros Critical Energy Facility Phase II - Census 2010 Minority Population by Census Block



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCES: Census 2010 PL 94-171 Data

ENVIRONMENTAL JUSTICE - FIGURE 2
Los Esteros Critical Energy Facility Phase II - Environmental Justice Population Based on Low Income



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: TIGER Data, S1701 ACS 5-Year Estimates, CA Dept. of Education Data Quest

STAFF RECOMMENDATIONS AND CONCLUSIONS

Staff concludes that the project modification would not result in significant adverse environmental impacts, and with new and revised air quality conditions of certification the project would remain in compliance with all applicable laws, ordinances, regulations, and standards. Staff also concludes that none of the required findings in Title 20, California Code of Regulations, section 1748(b) are applicable to this petition.

Staff also concludes that the proposed changes do not meet the criteria requiring production of subsequent or supplemental review as specified in Title 14, California Code of Regulations, sections 15162(a) and 15163(a).

ENERGY COMMISSION STAFF DETERMINATION

Pursuant to Title 20, California Code of Regulations, section 1769(a)(3)(A), CEC staff has determined for this petition that approval by the CEC at a noticed business meeting or hearing is not required and the proposed changes meet the criteria for approval by staff because:

i. there is no possibility that the change may have a significant impact on the environment,

ii. the change would not cause the project to fail to comply with any applicable laws, ordinances, regulations, or standards; and

iii. the change will not require a change to, or deletion of, a condition of certification adopted by the CEC in the final decision or subsequent amendments.

In accordance with 1769(a)(3)(B), CEC staff has determined, in consultation with the Bay Area Air Quality Management District, that the proposed changes to the air quality conditions of certification meets the criteria for approval at the staff level because:

i. the criteria in subdivisions (a)(3)(A)(i) and (ii) are met; and

ii. no daily, quarterly, annual or other emission limit will be increased as a result of the change.

WRITTEN COMMENTS

Any person may file an objection to staff's determination within 14 days of the date of this statement on the grounds that the project change does not meet the criteria set forth in sections 1769(a)(3)(A) and (B). As specified in 1769(a)(3)(C), any such objection must make a showing supported by facts that the change does not meet the criteria. Absent any such objection, this petition will be approved 14 days after this statement is docketed.

This statement is being provided to interested parties and property owners adjacent to the facility site, is being mailed to the LECEF mail list, and sent electronically to the LECEF listserv. Any person may comment on the petition. To use the CEC's electronic commenting feature, go to the CEC's webpage for this facility, cited above, click on the "Submit e-Comment" link, and follow the instructions in the on-line form. Be sure to include the facility name in your comments.

Written comments or objections may also be mailed to:

California Energy Commission
Docket Unit, MS-4
Docket No. 03-AFC-02C
1516 Ninth Street
Sacramento, CA 95814-5512

All comments and materials filed with the Dockets Unit will be added to the facility Docket Log and will be publicly accessible on the CEC's webpage for the facility.

If you have questions about this statement, please contact John Heiser, Compliance Project Manager, at (916) 653-8236 or via email at John.Heiser@energy.ca.gov

For information on participating in the CEC's review of the Los Esteros Critical Energy Facility petition, please contact the CEC's Public Advisor at (916) 654-4489, or at (800) 822-6228 (toll-free in California). The Public Advisor's Office can also be contacted via email at publicadvisor@energy.ca.gov.

News media inquiries should be directed to the CEC's Media Office at (916) 654-4989, or by email at mediaoffice@energy.ca.gov.

Attachments
Air Quality, Public Health, Soil and Water Resources, and Visual Plume Technical Area Analysis

Listserv:Los Esteros

STATEMENT OF STAFF APPROVAL OF PROJECT CHANGE
LOS ESTEROS CRITICAL ENERGY FACILITY (PHASE II) (03-AFC-2C)

Air Quality
Prepared by
Jacquelyn Record

INTRODUCTION

The Los Esteros facility is located at the intersection of State Route 237 and Zanker Road, in the city of San Jose, California. The Energy Commission approved Los Esteros 1 (Docket 01-AFC-12) on July 2, 2002, as a 180 MW "peaker" power plant with a limited three-year period of operation from its on-line date of March 2003. In October of 2006, the Energy Commission approved Phase II of a recertification to convert Los Esteros into a 320 MW combined-cycle facility (Docket 03-AFC-2).

On August 22, 2018, Los Esteros Critical Energy Facility, LLC, a subsidiary of Calpine Corporation (Petitioner), docketed a Petition to Amend (PTA) the Final Decision for the Los Esteros Critical Energy Facility Phase II (LECEF) (03-AFC-2C). This petition with the Energy Commission is requesting to modify the Los Esteros Critical Energy Facility Phase II (LECEF Phase II or the project) conditions of certification to maintain uniformity between the Bay Area Air Quality Management District and Energy Commission requirements. These requested changes would:

- Increase the water circulation rate also called throughput through the cooling tower from 73,000 gallons per minute (GPM) to 90,000-GPM.
- Delete provisions associated with initial compliance testing and monitoring for the periods immediately following facility commissioning, since these conditions are no longer applicable.
- Modify the air quality conditions to align with the proposed NSR and Title V Operating Permits.

The Bay Area Air Quality Management District (BAAQMD or District) has drafted an engineering evaluation for each of the requested changes.

ANALYSIS OF IMPACTS

Energy Commission staff have reviewed the requested project change for potential environmental effects and consistency with applicable LORS. Based on this review, staff determined that the petitioner's requests to amend the October 2006 Energy Commission Decision to align several air quality conditions of certification with the BAAQMD's permits which require a modification. This modification would also renew the project's Title V permit. The purpose of this review is to assure the facility would continue to meet all the

current requirements. The Energy Commission has jurisdiction over the siting and permitting of thermal power plants in California that generate 50 or more MW, including Los Esteros.

COOLING TOWER CIRCULATION RATE INCREASE

This project change requests approval to increase the water throughput rate of the LECEF Phase II cooling tower, from a rate of 73,000-gallons per minute (GPM) to a rate of 90,000-GPM. The project owner installed a pump rated for 90,000-GPM, but is operating it at the 73,000-GPM circulation rate limited by their license. According to the petition, the purpose of the increased pumping rate is to "optimize the current cooling tower design and increase the circulation rate to the design capacity" (LECEF 2018a). In accordance with the BAAQMD Regulation 2, Rule 2, section 206, the facility's cooling tower currently meets the requirement of Best Available Control Technology (BACT), which limits emissions of particulate matter with an aerodynamic diameter of 10 microns equal to or less (PM_{10}) by utilizing a drift rate of 0.0005 percent of the circulation rate. There would be no physical modification necessary in order to achieve an increase in the circulation rate.

Emissions

Cooling Tower

The following are the particulate matter (pm) emissions as calculated for the cooling tower rate increase from 73,000-GPM to 90,000-GPM. The full load operation of the facility expects to generate a potential increase of around 1.12 tons per year (tpy) in PM_{10}. The calculation is as follows.

Emissions for Six Cell Cooling Tower

It is conservatively assumed that all PM emissions are PM_{10}.
Current cooling tower circulation rate: 73,000-GPM
Maximum total dissolved solids: 6,000 ppm
Drift Rate: 0.0005%

Water mass flow rate:
(73,000 gal/min)(60 min/hr)(8.34 lb/gal) = 36,529,200 lb/hr

Current Cooling Tower Drift:
(36,529,200 lb/hr)(0.000005) = 182.65 lb/hr

Current PM_{10} Annual Emissions = (6,000 ppm)(182.65 lb/hr)/(10^6)
= 1.096 lb/hr
= 26.30 lb/day (assume 24 hr/day operation)
= 9600 lb/yr (assume 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 from 4.80 tpy to 5.92 tpy, a potential increase of 1.12 tpy.
The mass emission increase for PM_{10} due to the proposed cooling tower modification is equivalent to around 3 percent of the current permit limitation from the condition of certification **AQ-22**, which limits the facility's annual PM_{10} potential to emit (PTE) emissions to 38.5 tpy.

Staff reviewed the project's past three years of quarterly reports, specifically looking at actual, reported PM_{10} emissions. **Air Quality Table 2** shows the project's past three years of actual reported PM_{10} emissions.

Air Quality Table 2
Facility Wide Actual Reported PM_{10} Emissions (tpy)

Year	All Units PM10		Percent of Permit Limit [a]
	Lbs.	Tons	
2018	3,552	1.8	5%
2017	2,465	1.3	3%
2016	1,986	0.9	2%

[a] Annual permit limit for PM_{10} in **AQ-22** is 38.5 tons per year; percents are rounded to the nearest integer.

As demonstrated in **Air Quality Table 2**, the project's actual reported PM_{10} emissions from the facility are far less than the PTE for the project at the time of original permitting. Staff issued Data Requests on October 30, 2018, and the petitioner filed data responses on November 30, 2018. The project owner stated that "[t]he small increase in actual particulate matter emissions from the increased water circulation rate would result in an emission level below the facility's PTE. Therefore, the small emissions increase from the proposed modification would not result in a greater or different emissions impact from the facility, and will be more than covered by the existing mitigation" (LECEF 2018b). To calculate the project total increase in PTE, staff assumed the facility would operate every hour of the year, resulting in an increase in PTE of 1.12 tpy. Actual hours of operation are much lower and the actual increase in emissions would be lower. See **Air Quality Table 3**, on page 10 below, for recent capacity factors for LECEF. Staff concurs with the petitioner because the project provided PM_{10} mitigation through the surrendering of SO_2 offsets at a 3:1 ratio for PM_{10} mitigation. No additional mitigation is necessary for the potential PM_{10} increase.

Staff reviewed the previously provided mitigation required by **AQ-SC4** and **AQ-SC7** from the original Energy Commission license. **AQ-SC4** is not a part of the requested changes by the project owner and therefore would remain unchanged as part of this project change. The Deletion of **AQ-SC7** is among the changes requested by the petitioner. Staff agrees

the condition is no longer necessary because the facility provided the mitigation in March of 2011.

As part of this project change, there would be a modification to the **Equipment Description** preceding the permit section for stationary source number 11 (**S11**) to show the increase in cooling water circulation rate from 73,000-GPM to 90,000-GPM. Air Quality Condition of Certification **AQ-47,** would be increased to allow no more than 90,000-GPM.

The petitioner did not evaluate the associated increase in toxic air contaminants (TACs) as part of this project change. However, due to the addition of hypochlorite to the water, chloroform could potentially be a concern. Please see the **Public Health Section** of this analysis for the evaluation of TACs.

ALIGN CONDITIONS OF CERTIFICATION WITH THE BAAQMD TITLE V OPERATING PERMIT

The petitioner proposes to change several conditions of certification in order to align Energy Commission license conditions with the most recently proposed Title V Operating Permit requirements for the facility. LECEF also proposes to change certain definitions and additional conditions to align the proposed Title V Operating Permit definitions. The BAAQMD made revisions to the facility's proposed Title V operating permit. Staff has reviewed these changes and a discussion of each is below. The changes vary from correcting typographical errors to removing reporting requirements. The project owner has demonstrated more frequent reporting is no longer necessary. The air quality conditions of certification allow for this change the frequency of reporting when the project has demonstrated compliance with this condition.
The petitioner's requested changes are summarized as follows:

1. Add a definition of "Annual" meaning "within a calendar year".

2. Revise the definition of "Clock Hour": "Unless otherwise defined, any reference to the word hour is a clock hour."

3. Delete **AQ-21**. "Gas Turbine Shutdown Mode" is defined in the definitions and not needed in **AQ-21.** The current 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 **AQ-26(b)** to once every 8,000 hours of operation per power train or every three years, whichever is earlier.

8. Delete the testing requirement for formaldehyde and acetaldehyde in **AQ- 45**.

9. Delete provisions associated with initial compliance testing and commissioning activities.

The requested changes to the permit conditions also affects the following source due to being inadvertentlyomitted from past amendments:

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

No.1 – add the definition of "Annual" meaning "within a calendar year"

The mass emission limits in **AQ-22** and **AQ-24** are defined on a 12-consecutive month basis. The yearly fuel input limit in **AQ-24(a)** on an annual basis, and is defined as every 12-consecutive month period. This means that the project owner must be below the limits in every 12-consecutive month period. Therefore, the term "annual" in **AQ-22** and **AQ-24** cannot be defined as a calendar year.

The problem that the project owner 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 and CEC staff propose to solve this problem by requiring testing every twelve months but allowing a test postponement if the equipment is not operating. The District and CEC staff recommend declining to define "annual" as meaning "within a calendar year".

No. 2 – Revise the definition of "Clock Hour" to include: "Unless otherwise defined, any reference to the word hour is a clock hour.

A clock hour is not appropriate for rolling averages. The precursor organic compound (POC) limits in **AQ-19(d)** could be on a clock hour average. The District and Energy Commission staff recommend declining to change the definition, but rather to change the limits in **AQ-19(d)** to clock hour averages.

No. 3 – Delete AQ-21, because "Gas Turbine Shutdown Mode" is defined in the definitions and in AQ-21 and the definitions are inconsistent.

The definition, which is contained in the text that precedes the permit conditions, is stated as follows: "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 **AQ-19(a)** through **AQ-19(d)** until termination of fuel flow to the Gas Turbine." The following is the wording of **AQ-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."

Air Quality condition of certification **AQ-21** as currently in force does not contradict the definition. The District and Energy Commission staff recommend declining to make this change.

No. 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 on PG&E's website athttps://www.pge.com/pipeline/operations/sulfur/sulfur_info_values/index.page.

Staff requested additional information in the October 30, 2018, Data Requests regarding the facility's sulfur data results. The petitioner provided additional information requested by staff docketed on November 30, 2018 (LECEF 2018c). **Air Quality Figure 1** and **Air Quality Figure 2** show the facility's sulfur data results over the past five years. The project's total sulfur limit is 1.0-grain (gr) sulfur/100 standard cubic foot (scf).

Air Quality Figure 1 shows the total sulfur content of the fuel used at the facility. The results from years 2014 to 2018 were reported on a monthly frequency as required by the condition of certification. Over the most recent five years of testing results reported, all sampling results have been below the total sulfur content limit of 1.0-grain (gr) sulfur/100 standard cubic foot (scf).

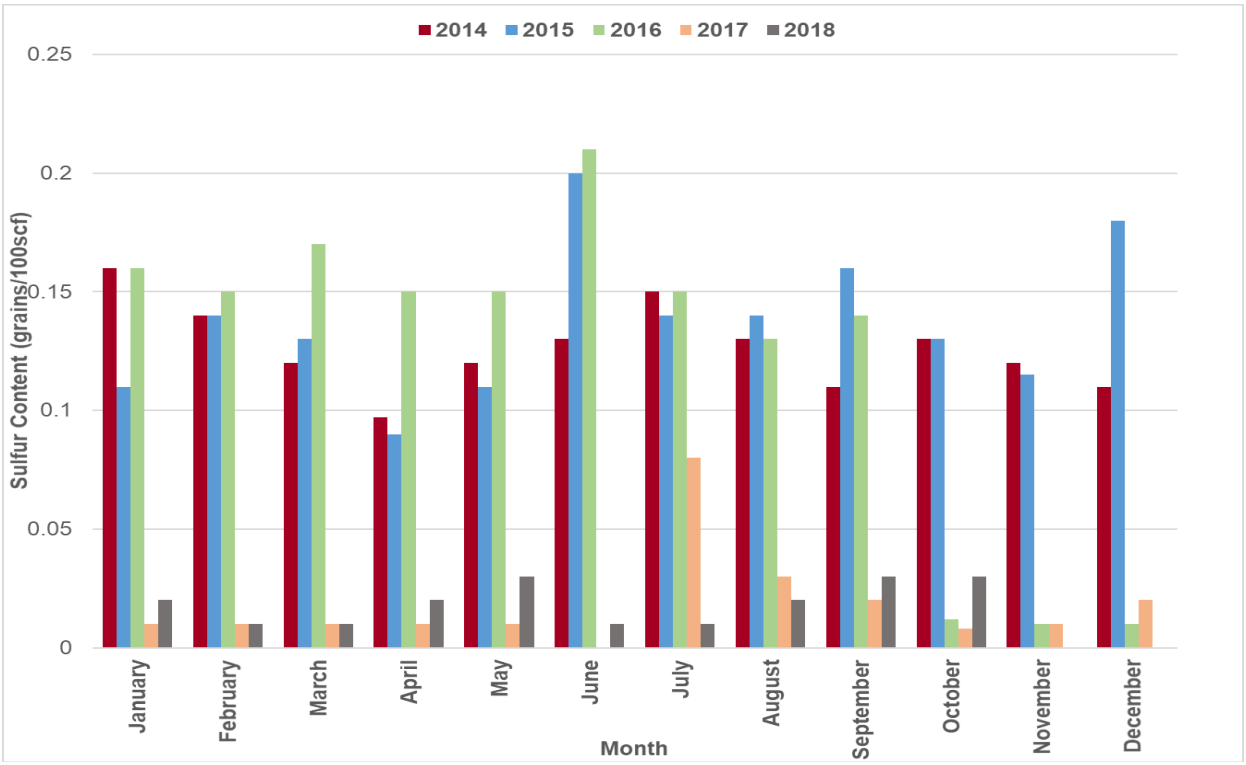
Air Quality Figure 2 shows the total sulfur content of natural gas system-wide for PG&E's monthly average results. PG&E measures sulfur at more than eleven locations in the Bay Area using online sulfur chromatographs. PG&E reports an average and a high value for each quarter. PG&E is allowed to have a maximum of no more than 1.0-grain sulfur/100 scf of gas, but the system-wide average is usually less than 0.25 grain sulfur/100 scf of gas as shown in **Air Quality Figure 2**. PG&E reports an average and a high value for each quarter.

The highest level reported since 2006 was 0.713-grain sulfur/100 scf of gas for the third quarter of 2009, below the maximum allowed, which is 1.0-grain sulfur/100 scf. PG&E displays the reported maximum values and system average values on their online database.

Onsite results for sulfur show a good correlation between sulfur content of gas measured by the facility onsite and system average values. Staff recommends allowing LECEF to use a system average value to report sulfur content of the gas they use. However, during source tests, LECEF must measure onsite sulfur content.

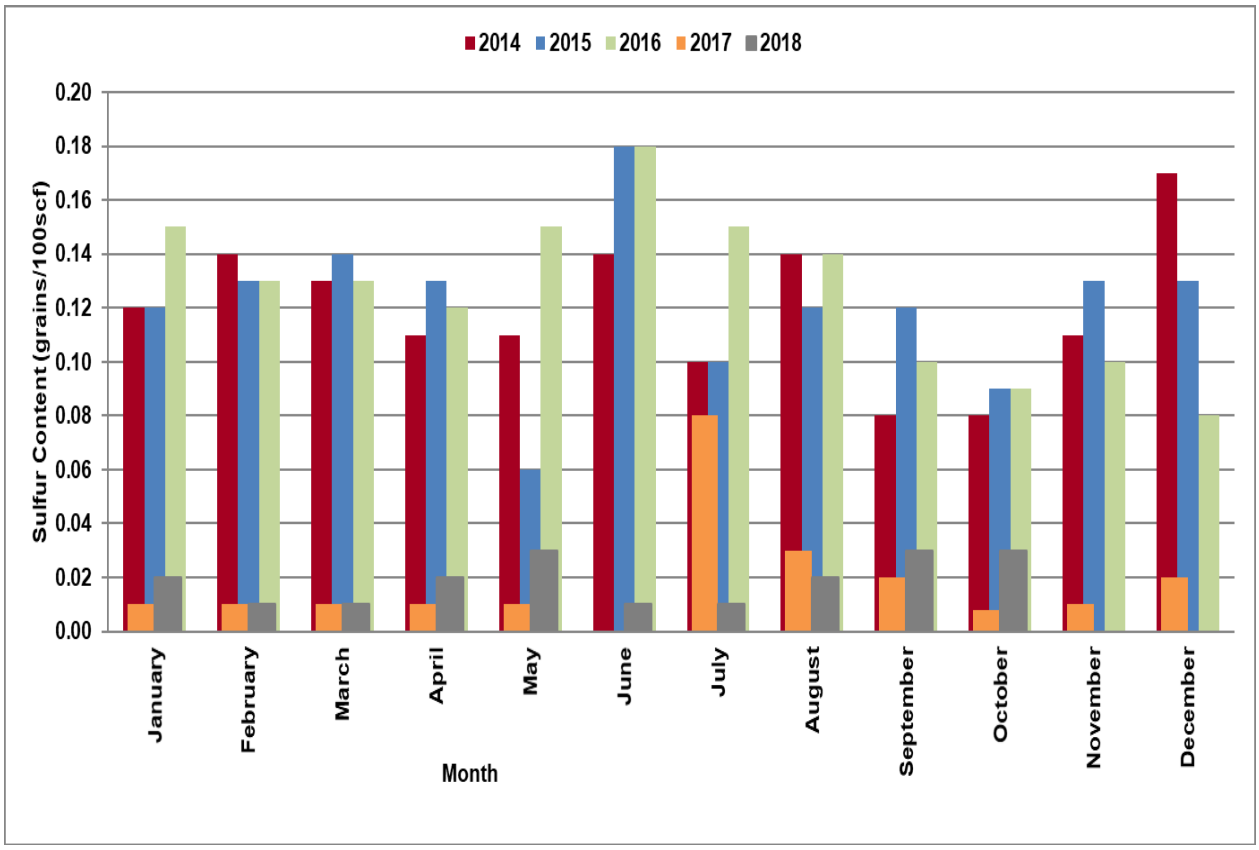
The petitioner analyzes a monthly natural gas sample at the project site using the American Society for Testing and Materials (ASTM) Method D5504, which uses gas chromatography and is accurate. This modification would affect **AQ-34(g)**. Due to the improved accuracy, the District staff along with Energy Commission staff recommend that the Energy Commission allow Calpine to use PG&E's natural gas sulfur 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.

Air Quality Figure 1
LECEF Total Sulfur Content Results



Source: Data from Data Responses from Petitioner (LECEF 2018b)

Air Quality Figure 2
PG&E Total System-Wide Average Sulfur Content Results



Source: Data are from PG&E's Gas System Sulfur Survey Results[1]

No. 5 – Delete the requirement for quarterly monitoring of the higher heating value of the fuel and rely on vendor analyses.

PG&E's analyses of the higher heating value should be sufficient to determine compliance with the hourly, daily, and annual heat input limits. This deletion would affect **AQ-24(b)**. The District and Energy Commission staff recommend this change.

No. 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.

The permit condition of certification **AQ-27** was written to allow for this change if the as-measured sulfuric acid mist concentration was low. In the most recent 2018 SAM source test, results for sulfuric acid in pounds (lb) per one million British thermal units (MMBtu)

[1] https://www.pge.com/pipeline/operations/sulfur/sulfur_info_values/index.page

vary from 0.0005 lb/MMBtu to 0.0011 lb/MMBtu. The annual estimated tons per year of sulfuric mist are calculated by averaging the lb/MMBtu emissions for each unit, multiplying the resultant average by the facility-wide maximum yearly heat input (18,215,000 MMBtu/year limited by **AQ-24**(a)) and then dividing by 2,000 lbs/ton. An average for all four turbines is calculated to be 0.00055 lb/MMBtu. The resultant emissions equal about 5.0 tpy of SAM.

Furthermore, operations of this facility have decreased significantly over the past few years, lowering annual SAM emissions. The facility has requested to change the frequency to once every 8,000 hours or every three years, whichever is sooner. This modification would affect **AQ-27**. The District and Energy Commission staff recommend this proposal.

No. 7 – Reduce the frequency of testing for criteria pollutants in AQ-26(b) to once every 8,000 hours of operation per power train or every three years, whichever is earlier.

The operations at LECEF have decreased significantly in 2016 and 2017, lowering air pollutant emissions. The facility has requested to change the frequency of criteria air pollutant testing to once every 8,000 hours or every three years, whichever is sooner. Staff has provided in **Air Quality Table 3** below the facility's annual capacity factor from 2013 to 2017; the annual capacity factor has ranged from five to twelve percent. This change would affect **AQ-26(b)**, and would likely result in testing being done every three years since it is not likely that the 8,000 hours (about a year of continuous operation) would ever be achieved. The District and Energy Commission staff recommend this proposal as acceptable.

Air Quality Table 3
Annual Capacity Factor for LECEF

2017	8%
2016	5%
2015	12%
2014	9%
2013	10%

Source: QFER database for LECEF using net MWh, from combined combustion and steam turbines.

No. 8 – Delete the testing requirement for formaldehyde and acetaldehyde in AQ- 45.

The Petitioner has proposed deleting the testing requirement for formaldehyde and acetaldehyde required by **AQ-43** and **AQ-45** because the conditions allow for deletion of the requirement if the formaldehyde is below 132 lb/yr and the acetaldehyde is below 288

lb/yr for three tests or more. Since the startup of LECEF, the project has been required to submit results once every two years to document total pounds per year of formaldehyde and acetaldehyde. According to sources tests provided to the Energy Commission, all of the results for formaldehyde and acetaldehyde have been below the permit limits in **AQ-45**. According to the results in **Air Quality Table 4**, since 2013 the project's formaldehyde and acetaldehyde annual emissions have all been well below their respective limits. The District and Energy Commission staff agree with this change.

Air Quality Table 4
Biannual Source Test Results for Formaldehyde and Acetaldehyde

	2013	2015	2017	Permit Limits in AQ-45
	pounds per year (lb/yr)	pounds per year (lb/yr)	pounds per year (lb/yr)	
Formaldehyde	<24.4	68	50	<132 lb/yr
Acetaldehyde	<24.4	68	50	<288 lb/yr

Source: Biannual Compliance Tests and RATA for 2013, 2015, and 2017.

No. 9 – Delete provisions associated with initial compliance testing and commissioning activities.

The project change request proposes to delete provisions associated with initial compliance testing and monitoring for the periods immediately following facility commissioning since these conditions are no longer applicable. The project change request proposes to delete references in the permit that discuss or impose limits on "Commissioning Activities" or "Commissioning Period" during the initial startup.

There are no physical modifications necessary nor are there any changes to facility emissions associated with this requested change. Deleting references to Commissioning Activities or Commissioning Period would not affect power plant equipment or the facility design because the facility has already met this requirement. Air Quality conditions of certification that would be affected by this modification are **AQ-1** through **AQ-11**. In the **definition section** of the District permit, which is located before the equipment section of the permit, the definitions define "Commissioning Activities" and "Commission Periods" during the initial startup. Staff agrees with the Petitioner that deleting the references to "Commissioning Activities" and "Commission Periods" are appropriate because the wording is obsolete and these activities have already taken place. The project change request also proposes to delete provisions associated with notification for the period immediately following facility commissioning and commencement of operations because these conditions are no longer applicable. Air Quality condition of certification **AQ-16** is associated with

"Notice of Commencement of Operation", which occurred in 2005. The Petitioner has requested this condition be deleted.

Staff recommends all of the above commissioning and initial startup activities be deleted because these activities are completed. The proposed modifications do not negatively affect air quality and would remain consistent with what was required in the original decision and subsequent amendments.

CONCLUSIONS

- Staff has reviewed a draft engineering evaluation from the BAAQMD for the project's proposed Title V permit, and the project would comply with all applicable BAAQMD rules and regulations. The final BAAQMD permit for the project is not yet available; however, the final permit is expected to be finalized by BAAQMD after the Energy Commission renders a decision. This change would not have a significant effect on the environment.
- With the adoption of the modified staff conditions recommended in this staff analysis, the project is expected to continue to comply with all applicable BAAQMD rules and regulations. The change would not cause the project to fail to comply with any applicable LORS.
- The amended project would result in a small increase in PM_{10} emissions; however, the facility's annual PM_{10} PTE is far less than its actual emissions. Therefore, the small emissions increase from the proposed modification would not result in any daily, quarterly, annual, or other emission limits to increase because the facility's PTE would still be well below the PM_{10} emission limits.
- These changes can be approved as staff-approved changes per Title 20, California Code of Regulations, section 1769(a)(3).

CONDITIONS OF CERTIFICATION CHANGES

Below is a list of the revised Air Quality conditions of certification, which were originally contained in the Decision for LECEF Phase II (Energy Commission 2006b), and a brief discussion of each proposed change. Once the Energy Commission has agreed to these changes, the BAAQMD will issue a Title V Permit for this facility including permit conditions that are included below as Air Quality conditions of certification. Strikeout designates deleted language and **underline and bold** indicates new language.

The modified Conditions of Certification for this project change request are as follows:

- In the **Equipment Description** preceding the permit section for the stationary source number 11 (**S11**) would be modified to show the increase in throughput from 73,000 to 90,000 gallons per min (GPM).

- In the **Equipment Description** preceding the permit section, the petitioner requests to remove all other options for various manufactures of fire pump engines. The emergency engine has been procured and the other options are no longer under consideration.
- In the **Definition Section** preceding the permit section, staff recommends deleting Commissioning Activities (initial startup) and Commissioning Period (initial startup) because these activities have already occurred.
- Delete **AQ-SC7**, because the condition has already been satisfied.
- Delete **AQ-1** through **AQ-11**, which were associated with initial compliance testing and monitoring for the period immediately following commissioning, because these have all been completed.
- Delete **AQ-16** "Notice of Commencement of Operation", because this step has already been completed.
- Modify **AQ-19(d)** to include "clock" hour.
- Administrative clean up to **AQ-23** to include stationary source number fourteen (**S14**), which was inadvertently omitted in previous amendments.
- Modify **AQ-24(b)** to allow for use of quarterly sulfur data obtained from PG&E's website, except during source tests.
- Delete language in **AQ-26(a)**, **AQ-26(b)**, **AQ-27**, **AQ-45**,and **AQ-47** that relates to initial startup.
- Modify language to allow for a new source test frequency in **AQ-26(b),** and **AQ-27,** to allow source testing to occur every three years or every 8,000 hours of operation, whichever occurs first, rather than annually.
- Modify **AQ-28**, to add the word "which" to correct a previous grammatical error.
- Modify **AQ-34(g)** to allow for use of quarterly sulfur data, as reported by PG&E, to be used in quarterly reports.
- Delete **AQ-35** regarding emission offsets, because this condition has been satisfied.
- Delete the number nine in **AQ-40**, as part of the California Code of Regulations referenced at the end of this condition of certification. The number nine was a typographical error.
- Delete the requirement for reporting formaldehyde and acetaldehyde in **AQ-45** because three consecutive biennial source tests demonstrated that the annual emission rates for these two compounds are far less than the limits in **AQ-45**.
- Modify **AQ-47** to ensure the project's cooling tower flow rate (which is called "throughput" in the condition) for **S11** does not exceed 90,000 gallons per minute (gal/min).

Equipment Description Changes

S-5 Fire Pump Diesel Engine, Clarke Model JW6H-UF40, 300 BHP, 14.5 gal/hr fuel consumption rate. ~~of either a 2012 or later model year, John Deere Family CJDXL13.5103 or Cummins Family ACEXL0540AAB, which Los Esteros may construct at its option to replace existing S-5, Fire Pump Engine~~

S-11 Six-Cell Cooling Tower, ~~73,000~~**90,000** gallons per minute with drift eliminator of 0.005% removal efficiency.

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.
MMBTU:	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 Condition of Certification **AQ-19** subparts a and c and is in compliance with the emission limits contained in subparts a and 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 Condition of Certification **AQ-19** subparts a through d until termination of fuel flow to the gas turbine.
Corrected Concentration:	The concentration of any pollutant (generally NOx, CO or NH_3) corrected to a standard stack gas oxygen concentration. For a gas turbine emission point, the standard stack gas oxygen concentration is 15% O_2 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 (during initial startup):~~	~~The period shall commence when all mechanical, electrical, and control systems are installed and individual system 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.

Requested Changes to Conditions of Certification:

~~AQ-SC7~~ ~~The project shall surrender the emission offset credits listed below or a modified list, as allowed by this condition, at the time that surrender is required by condition **AQ-35** (district permit Part 35). The project owner may request CPM approval for any substitutions or modification of credits. The CPM, in consultation with the District, may approve any such change to the ERC list provided that the project remains in compliance with all applicable laws, ordinances, regulations, and standards, the requested change(s) clearly will not cause the project to result in a significant environmental impact, and each requested change is consistent with applicable federal and state laws and regulations.~~ **Deleted**

~~Required Emission Reduction Credits~~

~~ERC Number~~	**~~Source Location (City)~~**	**~~Date Banked~~**	**~~Source Type~~**	**~~NO_x (tpy)~~**	**~~POC (tpy)~~**
~~1201~~	~~San Francisco~~	~~9/30/85~~	~~Potrero Power Plant~~	~~304.594~~	~~-~~
~~Total ERC Available~~				~~304.594~~	**~~-~~**
~~Los Esteros Phase 2 ERC Requirement~~				**~~23.35~~**	**~~-~~**

~~Verification~~: ~~The project owner shall submit to the CPM a list of ERCs to be surrendered to the District at least 60 days prior to initial startup. If the CPM, in consultation with the District, approves a substitution or modification, the CPM shall file a statement of the approval with the commission docket and mail a copy of the statement to every person on~~

~~the post-certification mailing list. The CPM shall maintain an updated list of approved ERCs for the project.~~

~~**COMMISSIONING CONDITIONS OF CERTIFICATION**~~

~~**AQ-1**~~ ~~The owner/operator of the Los Esteros Critical Energy Facility shall minimize the emissions of carbon monoxide and nitrogen oxides from S-1, S-2, S-3 and S-4 Gas Turbines and S-7, S-8, S-9, and S-10 Heat Recovery Steam Generators to the maximum extent possible during the commissioning period. **AQ-1** through **AQ-11** shall only apply during the commissioning period as defined above. Unless noted, **AQ-12** through **AQ-49** shall only apply after the commissioning period has ended. (Basis: cumulative increase)~~ **Deleted**

Verification: ~~The project owner/operator shall specifically demonstrate compliance with this Condition of Certification as part of the Commissioning Plan and Monthly Commissioning Emissions Reports required by **AQ-5** and **AQ-10** respectively.~~

~~**AQ-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 S-1, S-2, S-3 and S-4 Gas Turbine combustors to minimize the emissions of carbon monoxide and nitrogen oxides. (Basis: cumulative increase)~~ **Deleted**

Verification: ~~The project owner/operator shall specifically demonstrate compliance with this Condition of Certification as part of the Commissioning Plan and Monthly Commissioning Emissions Reports required by **AQ-5** and **AQ-10** respectively.~~

~~**AQ-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 (A-10, A12, A-14 & A-16) and OC Systems (A-9, A-11, A-13 & A-15) to minimize the emissions of nitrogen oxides and carbon monoxide from S-1, S-2, S-3 and S-4 Gas Turbines and S-7, S-8, S-9, and S-10 Heat Recovery Steam Generators. (Basis: cumulative increase.)~~ **Deleted**

Verification: ~~The project owner/operator shall specifically demonstrate compliance with this Condition of Certification as part of the Commissioning Plan and Monthly Commissioning Emissions Reports required by **AQ-5** and **AQ-10** respectively.~~

~~**AQ-4** Coincident with the steady-state operation of SCR Systems (A-10, A-12, A-14, & A-16) and OC Systems (A-9, A-11, A-13, & A-15) pursuant to **AQ-3**, the owner/operator shall operate the facility in such a manner that the Gas Turbines~~

~~(S-1, S-2, S-3 and S-4) comply with the NO_x and CO emission limitations specified in **AQ-19a** and **AQ-19c**. (Basis: BACT, offsets.)~~ **Deleted**

~~**Verification**: The project owner/operator shall specifically demonstrate compliance with this Condition of Certification as part of the Commissioning Plan and Monthly Commissioning Emissions Reports required by **AQ-5** and **AQ-10** respectively.~~

~~**AQ-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 S-1, S-2, S-3 & S-4 Gas Turbines and/or S-7, S-8, S-9, & S-10 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_x continuous emission monitors, and any activities requiring the firing of the Gas Turbines (S-1, S-2, S-3 and S-4) without abatement by their respective SCR Systems. The Gas Turbines (S-1, S-2, S-3 and S-4) shall be fired in combined cycle mode no sooner than fourteen days after the District receives the commissioning plan. (Basis: cumulative increase.)~~ **Deleted**

~~**Verification**: The project owner/operator shall submit a Commissioning Plan to the District Permit Services Division and the CPM for approval at least two weeks prior to first fire of S-1, S-2, S-3 and S-4.~~

~~**AQ-6** During the commissioning period, the owner/operator of the Los Esteros Critical Energy Facility shall demonstrate compliance with **AQ-8** through **AQ-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.~~

~~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 S-1, S-2, S-3 and S-4 Gas Turbines and S-7, S-8, S-9, and S-10 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_x 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 project owner shall install dual span emission monitors. (Basis: cumulative increase.)~~ **Deleted**

~~Verification~~: ~~The project owner/operator shall specifically demonstrate compliance with this Condition of Certification as part of the Commissioning Plan and Monthly Commissioning Emissions Reports required by **AQ-5** and **AQ-10** respectively.~~

~~AQ-7~~ ~~The owner/operator shall install, calibrate and make operational the District-approved continuous monitors specified in **AQ-6** prior to first firing of each turbine (S-1, S-2, S-3 and S-4 Gas Turbines) and HRSG (S-7, S-8, S-9, and S-10 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 NOxemission 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 project owner shall install dual-span monitors. (Basis: BAAQMD 9-9-501, BACT, offsets.)~~ **Deleted**

~~Verification~~: ~~The project owner/operator shall notify the District and CPM of the date of expected first fire at least 30 days prior to first fire and shall make the project site available for inspection if desired by either the District or CPM.~~

~~AQ-8~~ ~~The owner/operator shall not operate the facility such that the number of firing hours of S-1, S-2, S-3 and S-4 Gas Turbines and/or S-7, S-8, S-9, and S-10 Heat Recovery Steam Generators without abatement by SCR or OC systems exceed 250 hours for each power train during the commissioning period. Such operation of the S-1, S-2, S-3 and S-4 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**

~~Verification~~: ~~The owner/operator shall provide written notice to the CPM and the District Permit Services & Enforcement Divisions within five business days of completion of all commissioning activities, at which time the unused balance of the 250 firing hours without abatement shall expire.~~

~~**AQ-9** The total mass emissions of nitrogen oxides, carbon monoxide, precursor organic compounds, PM_{10}, and sulfur dioxide that are emitted by the S-1, S-2, S-3 and S-4 Gas Turbines and S-7, S-8, S-9, and S-10 Heat Recovery Steam Generators during the commissioning period shall accrue towards the consecutive twelve-month emission limitations specified in **AQ-22**. (Basis: offsets.)~~ **Deleted**

~~**Verification**: The project owner/operator shall specifically demonstrate compliance with this Condition of Certification as part of each Monthly Commissioning Emissions Report required by **AQ-10** and as part of the first Quarterly Operations Report required by **AQ-34** after the completion of commissioning.~~

~~**AQ-10** The owner/operator shall not operate the facility such that the pollutant mass emissions from each turbine (S-1, S-2, S-3, and S-4 Gas Turbines) and corresponding HRSG (S-7, S-8, S-9, and S-10 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 S-1, S-2, S-3, and S-4 Gas Turbines.~~ **Deleted**

	~~**Without Controls**~~		~~**With Controls**~~	
~~a. NOx (as NO_2)~~	~~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_4)~~	~~288 lb/day~~		~~60 lb/day~~	
~~(basis: cumulative increase)~~				

~~**Verification**: The project owner/operator shall submit to the CPM for approval, a Monthly Commissioning Emissions Report that includes fuel use, turbine operation, post combustion control operation, ammonia use and CEM readings on an hourly and daily basis.~~

~~**AQ-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 initial 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 twenty (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 sixty (60) days of the source testing date. These results can be used to satisfy applicable source testing requirements in **AQ-26** below (Basis: offsets.)~~**Deleted**

~~**Verification**: The project owner/operator shall submit the source test plan and results as required in the time frames indicated in this Condition of Certification.~~

OPERATIONS CONDITIONS OF CERTIFICATION

~~**AQ-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**

AQ-19 Emissions Limits: The project owner shall operate the facility such that none of the following limits are exceeded:

d. Emissions of precursor organic compounds (POC) from emission points P-1, P-2, P-3, and P-4 (combined exhaust of gas turbine/HRSG power trains S-1 & S-7, S-2 & S-8, S-3 & S-9, and S-4 & S-10, respectively) each shall not exceed 1 ppmvd @ 15% O_2 (1-**clock** hour average), except during periods of gas turbine start-up or shut-down 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.)

Verification: The project owner shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification **AQ-34**.

AQ-23 Sulfuric Acid Mist Limit: The owner/operator shall operate the LECEF so that the sulfuric acid mist emissions (SAM) from S-1, S-2, S-3, S-4, S-7, S-8, S-9, ~~and~~ S-10**, and S14** combined do not exceed 7 tons totaled over any consecutive four quarters. (Basis: Regulation 2-2-306.)

Verification: The project owner/operator shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification **AQ-34**.

AQ-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:

b. Only PUC-Quality natural gas (General Order 58a) 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 project owner shall **use the quarterly sulfur data on PG&E's website except during any source test.** ~~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 **AQ-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.~~ (Basis: BACT for SO_2 and PM_{10}.).

Verification: The project owner shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification **AQ-34**. ~~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.~~

AQ-26 a. RATA: ~~Within one hundred and twenty (120) days of the initial startup of the gas turbines and HRSGs, and at a minimum o~~**O**n an annual basis ~~thereafter~~, the owner/operator shall perform a relative accuracy test audit (RATA) on the CO CEMS in accordance with 40 CFR Part 60 Appendix B, Performance Specifications, and on the NOx and O_2 CEMs in accordance with 40 CFR Part 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.** ~~an annual basis~~. **However, if a power train is not operating when the period has expired, the source test may be postponed until no later than 60 days after 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 within sixty days after testing. A complete 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 NOx, CO, POC, and stack gas oxygen content conducted in accordance with ARB Test Method 100; measurements of PM10 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 Conditions 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:

i. NOx – ppmvd at 15% O_2, lb/MMBtu and lb/hr (as NO_2)

ii. Ammonia – ppmvd at 15% O_2 (Exhaust)

iii. CO – ppmvd at 15% O_2, lb/MMBtu and lb/hr (Exhaust)

iv. POC – ppmvd at 15% O_2, lb/MMBtu and lb/hr (Exhaust)

v. PM10 – lb/hr (Exhaust)

vi. SOx– lb/hr~~(Based on sulfur content of fuel as measured by utility)~~

vii. 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 use Summa canisters with an inner coating of Silcosteel or Sulfinert or a District approved equivalent for the sample.)**

viii. Turbine load in megawatts

ix. Stack gas flow rate (DSCFM) calculated according to procedures in U.S. EPA Method 19

x. Exhaust gas temperature (°F)

xi. Ammonia injection rate (lb/hr or moles/hr)

xii. Water injection rate for each turbine at S1, S2, S3, & S4

(Basis: source test requirements & monitoring)

Verification: At least 30 days prior to the date of each source test, the owner/operator shall submit a source test protocol to the District and the CPM for approval. At least 10 days prior to the testing date, the owner/operator shall notify the District and the CPM of the date of the source test. **The written test results of the source test shall be provided to the District and CPM within sixty days**

after testing. ~~No more than 30 days after the date of the source test, the owner/operator shall submit the results of the RATA and source test to the District and the CPM for approval.~~

AQ-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 P-1, P-2, P-3, and P-4 while each Gas Turbine/HRSG power train is operating at maximum load to demonstrate compliance with the SAM emission limit specified in **AQ-23**. **However, if a power train is not operating when the test is required, the source test may be postponed until no later than 60 days after the power train starts up again.** ~~The results of the initial source test must be submitted within 165 days of startup. Subsequent source test must be submitted within 60 days of the date of the source test.~~**The written test results of the source test shall be provided to the District and the CPM within sixty day after testing.** The project owner shall test for SO3 evaluated as H_2SO_4 and sulfuric acid mist (SAM). ~~After acquiring one year of source test data on these units, the project owner 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)

Verification: The project owner shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification **AQ-34**.

AQ-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.)

Verification: The owner/operators shall make access available to the facility and records upon request as set forth in Condition of Certification **AQ-15**.

AQ-34 **Reporting**: The owner/operator shall submit to the District **and the CPM** 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.~~**Deleted**
(Basis: recordkeeping & reporting)

Verification: The owner/operator shall submit to the District and the CPM for approval, written reports for each calendar quarter, within thirty (30) days of the end of the quarter. Each quarterly report will also include, at a minimum, all required compliance documentation for the following conditions**: AQ-12**, **13**, **19**, **20**, **21**, **22**, **23**, **24**, **27**, **30**, **31**, **36**, **37**, **39**, **40**, **46,** and **47**. The report submitted in January of each year shall include an annual summary of the four quarterly reports of the preceding year.

AQ-35 ~~**Emissions Offsets**: The owner/operator 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**

Verification: ~~At least 10 days prior to the issuance of the ATC, the project owner/operator shall submit all necessary ERC certificates to the District and provide copies of all documentation to the CPM at the same time.~~

AQ-40 The project owner shall operate S-5 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 ~~9~~**(**e)(2)(A)(3) or (e)(2)(B)(3)).

Verification: The project owner/operator shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification **AQ-34**

AQ-45 ~~Within 120 days of initial start-up of the Los Esteros Critical Energy Facility and~~ **O**n a biennial (once every two years) basis ~~thereafter~~, the project owner shall conduct a District-approved source test at exhaust point P-1, P-2, P-3, or P-4 while the Gas Turbines are at maximum allowable operating rates to demonstrate compliance with **AQ-44**. The results of the initial source test must be submitted within 165 days of initial startup. Subsequent source test results 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 5 are less than the BAAQMD Toxic Risk Management Policy trigger levels shown below, then the project owner 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 2-5)

Verification: At least 20 days prior to the intended source test date, the project owner shall submit a source testing methodology to the District and CPM for review and approval. Within 30 days of the source testing date, all test results shall be submitted to the District and the Energy Commission CPM.

AQ-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_{10} emission rate from the cooling tower to verify compliance with the vendor-guaranteed drift rate specified in **AQ-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 **AQ-46**. **The owner/operator shall ensure that the throughput at S11 does not exceed 90,000 gal/min**(Basis: ~~BACT,~~**Regulation 2-1-319,** cumulative increase.)

Verification: The project owner/operator shall verify compliance with this Condition of Certification in the fourth quarter report of each year required by Condition of Certification **AQ-34**.

References

LECEF 2018a – Los Esteros Critical Energy Facility, LLC, Los Esteros Critical Energy Facility Application for Amendment No. 6 for 03-AFC-2C. TN #224569. Docketed August 22, 2018.

LECEF 2018b – Los Esteros Critical Energy Facility, LLC, Los Esteros Critical Energy Data Response. Docket Number 03-AFC-02C. TN #225546. Docketed October 30, 2018.

LECEF 2018c – Applicant's Responses to Staff's Data Requests, Set 1, A1 through A8. Docket Number 03-AFC-02C. TN #225991. Docketed November 30, 2018.

QFER 2019 - QFER CEC-1304 Power Plant Owner Reporting Database. https://www.energy.ca.gov/almanac/electricity_data/web_qfer/. Accessed January 2019.

PG&E – Pacific Gas and Electric, Gas System Sulfur Survey Results. https://www.pge.com/pipeline/operations/sulfur/sulfur_info_values/index.page. Accessed February 2019.

STATEMENT OF STAFF APPROVAL OF PROJECT CHANGE
LOS ESTEROS CRITICAL ENERGY FACILITY (PHASE II) (03-AFC-2C)

Public Health

Prepared by
Huei-An (Ann) Chu, Ph.D.

INTRODUCTION

As stated by the facility owner, the purpose of the modification is to optimize cooling tower design as needed to meet the plant performance requirements of the project. The October 2006 Energy Commission Final Decision included one Public Health condition of certification to mitigate potential growth of bacteria, especially Legionella, in the cooling tower system basin. The increased flow rate would not affect this condition.

CONSTRUCTION

The existing pump system at the facility was designed to handle the increased flow rate. There would be no construction associated with the increase in the circulation rate of the cooling tower water and no construction related emissions would occur. Staff concludes that there would be no construction period and no construction impacts.

OPERATION

Toxic Air Contaminants (TACs)

For the proposed cooling system water flow rate increase, there would be increased toxic air contaminant (TAC) emissions from the routine operation of the modified LECEF. The TACs potentially emitted in increased amounts from the project include ammonia, nickel and zinc. In order to confirm that there would be no new issues or potential impacts associated with public health related to the proposed cooling system modification, the project owner conducted a health risk assessment (HRA) using the Hotspots Analysis and Reporting Program, Version 2 (HARP2) computer model. Health risks were evaluated for a hypothetical maximum exposed individual (MEI) located at the maximum impact receptor (MIR). The analysis indicated the following results for the MIR/MEI receptor; cancer risk of 5.48×10^{-9}, chronic hazard index (HI) of 0.000347, and an acute HI of 0.0000243. A risk of less than 1×10^{-6} for cancer and a Health Hazard Index of less than 1 for chronic or acute exposures are considered to be insignificant. The results demonstrate that there would be no significant change in the cooling tower system's contribution to facility-wide health risk significance levels. A summary of the results is presented below in **Public Health Table 1** and shows that the proposed cooling tower system modification would not result in significant public health-related impacts.

Staff has reviewed the project owner's evaluation of potential public health impacts and consistency with applicable laws, ordinances, regulations, and standards (LORS). Based on this review, staff does not expect any significant adverse cancer, or short- or long-term non-cancer health effects from the project's toxic air emissions. Therefore, staff concludes that the proposed project modifications would not result in a significant adverse impact to public health during operations or cause the project to be noncompliant with applicable LORS.

Public Health Table 1
Operation Hazard/Risk at Point of Maximum Impact

Type of Hazard/Risk	Risk Values	Significance Level	Significant?
Cancer Risk	5.48×10^{-9}	1×10^{-6}	No
Chronic Hazard Index	0.000347	1	No
Acute Hazard Index	0.0000243	1	No

Environmental Justice

Staff has also considered the potential for adverse public health impacts to the minority population surrounding the site. According to the risk results of **Public Health Table 1**, the project's public health impacts would be less than significant. Therefore, the project would not result in a significant or adverse impact to any population in the project's six-mile radius, including the EJ population represented in **Environmental Justice Figure 1, Figure 2, and Table 1**.

CONCLUSIONS

Staff has analyzed potential public health risks associated with the construction and operation of the modifications proposed in LECEF's Petition to Amend the Energy Commission's Final Decision. Staff does not expect any significant adverse cancer, short-term, or long-term health effects on any members of the public, including low income and minority populations, from the project's toxic emissions. Staff also concludes that there is no need to add or change any Public Health Condition of Certification and that LECEF would remain in compliance with all applicable LORS.

REFERENCES

CEC 2006—Los Esteros Critical Energy Facility II, Phase 2, October 2006 (TN 224679).

LECEF 2018 -- Petition to Amend (PTA) the Commission Decision. CEC Docket: 03-AFC-02C. August 22, 2018 (TN 224569).

STATEMENT OF STAFF APPROVAL OF PROJECT CHANGE
LOS ESTEROS CRITICAL ENERGY FACILITY (PHASE II) (03-AFC-2C)

Soil and Water Resources

Prepared by
Mike Conway

SCOPE OF ANALYSIS

The scope of this analysis is to determine whether modification of the cooling tower water circulation rate would result in significant impacts to soil and water resources. If potential impacts might occur, CEC staff (staff) identifies whether existing laws, ordinances, regulations, and standards (LORS) or conditions of certification address the impacts. Staff also identifies whether it is necessary to change, delete, or add any new condition(s) of certification in order to avoid, or reduce to less than significant levels, identified risks to the environment associated with this petition.

BACKGROUND

LECEF was certified by the Energy Commission in October 2006 as a 320-MW (nominal) natural gas-fired combined-cycle power plant in the northern part of the city of San Jose, Santa Clara County. It consists of four General Electric LM6000 SPRINT combustion turbine generators, four heat recovery steam generators, a 140-MW steam turbine generator, and a six-cell cooling tower system.

ANALYSIS

The currently permitted pump system already has the capacity to supply water circulation at the increased (proposed) rate. Therefore, there would be no physical modifications at the facility in order to achieve the increase in the circulation rate.

The proposed increase in circulation of water for the evaporative cooling tower system from 73,000 to 90,000 gpm, could result in an increase in water consumption and wastewater discharge. The increase in circulation could also cause some small change in water use and discharge from the steam cycle system.

LECEF uses recycled water for industrial purposes. The recycled water is supplied from the South Bay Water Recycling (SBWR) Program in the city of San Jose. SBWR has not placed any restrictions on LECEF that would prohibit the proposed increase in use. Use of recycled water for industrial purposes is encouraged consistent with Energy Commission water policy. Also, the San Jose/Santa Clara Water Pollution Control Plant has not placed any restrictions on LECEF that would prohibit disposal of the proposed increase or change in quality of the wastewater discharge (LECEF 2018b).

Staff reviewed the project's conditions of certification and found that none of the conditions would require modification as a result of the proposed change. The project will also continue to report its water use in an annual summary, which will include the monthly range and monthly average of daily usage in gallons per day, and total water used by the project on a monthly and annual basis in acre-feet, in accordance with condition of certification **SOIL&WATER-6**.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS COMPLIANCE

Staff has reviewed the LORS identified in the Energy Commission's Final Decision for the LECEF (CEC 2006) and found that they remain applicable.

CONCLUSIONS AND RECOMMENDATIONS

After considering the proposed modifications, staff believes that they would not result in any additional environmental impacts in terms of soil and water resources, in comparison with the original analysis for the final decision. The existing conditions of certification are adequate to ensure that there would be no unmitigated significant impacts. The project will also comply with applicable LORS.

PROPOSED CHANGES OR MODIFICATION TO CONDITIONS OF CERTIFICATION

None.

REFERENCES

CEC 2006 - California Energy Commission Final Commission Decision, Los Esteros Critical Energy Facility Phase II, October 19, 2006, Docket No. 03-AFC-02 (CEC Order 06-1011-05) (TN#: 38207)

LECEF 2018a – Los Esteros Critical Energy Facility Phase II (03-AFC-02C): Petition to Amend, Docketed August 22, 2018 (TN #: 224569)

LECEF 2018b - Los Esteros Critical Energy Facility License (03-AFC-02C): Cooling Tower Amendment Responses to Staffs Data Requests, Set 1, Al through A8, November 30, 2018 (TN#: 225991)

STATEMENT OF STAFF APPROVAL OF PROJECT CHANGE
LOS ESTEROS CRITICAL ENERGY FACILITY (PHASE II) (03-AFC-2C)

Visible Plume
Prepared by
Jacquelyn Record

INTRODUCTION

The petitioner has requested in this Petition to Amend (PTA), approval to increase the water circulation rate through the six-cell cooling tower from 73,000 gallons per minute (GPM) to the design rate of 90,000 GPM. The stated purpose is to optimize cooling tower design as needed to meet the plant performance requirements of the project. For the technical section of Visual Resources, staff identified a potential for an increase in the frequency of forming visible plumes from the cooling tower. Therefore, staff evaluated whether the facility would continue to comply with the cooling tower visible plume Condition of Certification **VIS-6**.

To perform this evaluation, staff completed a plume fogging frequency curve comparison analysis for the petitioner's proposed revision to the cooling tower's maximum water recirculation rate.

FACILITY DESCRIPTION

The LECEF facility includes 1) four General Electric LM 6000 PC Sprint type engines with inlet air chillers, small duct burners, and a heat recovery section; and 2) one six-cell, plume-abated cooling tower, and a one-cell plume-abated cooling tower.

COOLING TOWER VISIBLE PLUME ANALYSIS

Staff reviewed the frequency fogging curve information associated with a 73,000 GPM circulation rate, as originally adopted in the licensing of Los Esteros Critical Energy Facility Phase II (LECEF 2004). Staff submitted Data Requests (CEC 2019) requesting a new frequency fogging curve for the increase in water circulation rate to 90,000 GPM. The petitioner docketed data responses (LECEF 2019) with the new frequency fogging curve and staff compared the two fogging curves to identify how the increase in water circulation rate would affect the potential formation of visible plumes.

Staff compared the effects of the two different water circulating flow rates by analyzing the cooling tower fogging curves with duct firing on and with duct firing off. The fogging curves are developed by the manufacturer of the cooling tower, and are issued to aid in predicting the occurrence of what they call "fogging". On days of predicted fogging, the facility

operators have the ability to engage plume abatement dampers to decrease or eliminate fogging (LECEF 2019). The fogging curves comparisons are shown in **Figures 1** and **2**. Visible plumes only form in the region of each graph above the fogging curve line. In both duct fired (**Figure 1**) and non-duct fired (**Figure 2**) cases, the new fogging curve for the 90,000 GPM circulating flow rate case is above the fogging curve for the 73,000 GPM case, meaning a reduction in the potential for visible plume formation. To further explain, with the cooling tower plume abatement dampers on, it would take higher relative humidity in the ambient air at a given wet bulb temperature in order for a visible plume to form.

Condition of Certification **VIS-6** states, "The project owner shall reduce the six-cell cooling tower visible vapor plumes through the use of a dry-cooling section that has a stipulated plume abatement design equivalent to or better than that depicted in the Data Request Response No. 53 Attachment **VIS-3** Fogging Frequency Curve, dated April 2004." The project is expected to continue to comply with **VIS-6** because the new fogging curve shows that an increase in the water circulation rate would be "better than" the existing fogging curve at the lower circulating rate. An increase in circulating flow rate would have a lower potential to form visible plumes, compared to what was analyzed and approved in the original Energy Commission decision.

In conclusion, with the cooling tower plume abatement on, visible plume frequencies are expected to be reduced. As depicted in **Figures 1** and **2** more extreme weather conditions would be necessary in order for a visible plume to form with the increase in cooling tower recirculating rate. Therefore, if the requested PTA is approved, staff concludes the project would continue to comply with **VIS-6,** and this condition requires no modification.

REFERENCES

CEC 2019 - California Energy Commission. Energy Commission Staff's Data Requests Set 2, A1 - A4, docketed May 9, 2019. TN 228224

LECEF 2004 - Los Esteros Critical Energy Facility, LLC. Data Requests 1-57 – POS, docketed April 7, 2004, TN 31479

LECEF 2019 - Los Esteros Critical Energy Facility, LLC. Los Esteros Critical Energy Facility Cooling Tower Amendment Response to Staff's Data Requests Set 2 A1 through A4, docketed August 7, 2019, TN 229268.