

CALIFORNIA ENERGY COMMISSION1516 NINTH STREET
SACRAMENTO, CA 95814-5112

**STATE OF CALIFORNIA
ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION**

DOCKET**01-AFC-19C**

DATE _____

RECD. NOV 08 2011

In the Matter of:) **Docket No. 01-AFC-19C**

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) **Order No. 11-1102-5**

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**Sacramento Municipal Utility District
(SMUD) Financing Authority**

) **ORDER APPROVING a Petition to Modify**
) **the Fuel Supply and other Modifications to**
) **the SMUD Cosumnes Power Project**
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On December 29, 2010, the Sacramento Municipal Utility District (SMUD) Financing Authority submitted an Amendment Petition for fuel supply modifications and to revise Conditions of Certification (COC)s **AQ-17, AQ-18, AQ-19, AQ-24, AQ-32, AQ-33, AQ-36, AQ44** through **AQ-53** and **WATER RES-1**. The change would be beneficial to the public and owner by redirecting digester gas from the Carson Ice-Gen (also known as Central Valley Financing Authority Cogeneration Plant, Docket No. 92-SPPE-1) and more efficiently burning the fuel at the SMUD Cosumnes Power Plant. Refinements to the water filtration system would allow the project owner to maximize generation on high-temperature days while maintaining compliance with the annual water use limit.

In addition, the change would be beneficial to the owner by refining the allowable levels of total dissolved solids in the cooling tower recirculation water to match the actual performance of the newly installed OnePass water filtration system. This change is necessary due to the increase of Total Dissolved Solids (TDS) in the water supply for the project.

The Sacramento Municipal Air Quality Management District (SMAQMD) completed the public review process and enhanced new source review of the modifications to the turbines, cooling tower and baghouse on July 18, 2011. A Draft Authority to Construct (ATC) document was issued July 28, 2011. If the Energy Commission approves the Petition to Amend then a Final ATC would be issued by the SMAQMD.

STAFF RECOMMENDATION

Energy Commission staff reviewed the petition and finds that it complies with the requirements of Title 20, Section 1769(a) of the California Code of Regulations and recommends approval of SMUD Financing Authority's petition to modify the SMUD Cosumnes Power Project and amend related Conditions of Certification.

ENERGY COMMISSION FINDINGS

Based on staff's analysis, the Energy Commission concludes that the proposed changes will not result in any significant impact to public health and safety, or the environment. The Energy Commission finds that:

- The petition meets all the filing criteria of Title 20, section 1769(a) of the California Code of Regulations concerning post-certification project modifications;
- The modification will not change the findings in the Energy Commission's Final Decision pursuant to Title 20, section 1755;
- The project will remain in compliance with all applicable laws, ordinances, regulations, and standards, subject to the provisions of Public Resources Code section 25525;
- The change would be beneficial to the public and owner by redirecting digester gas from the Carson Ice-Gen (also known as Central Valley Financing Authority Cogeneration Plant, Docket No. 92-SPPE-1) and more efficiently burning the fuel at the SMUD Cosumnes Power Plant. Refinements to the water filtration system would allow the project owner to maximize generation on high-temperature days while maintaining compliance with the annual water use limit; and,
- There has been a substantial change in circumstances since the Energy Commission certification justifying the change in that the consumption of blended digester gas would be more efficiently burned at the Cosumnes Power Project than the Carson Ice-Gen facility due to new equipment being installed at the Carson Ice-Gen facility. In addition, the water quality of the supplied water to the project has diminished requiring changes to the OnePass water filtration system. Unexpected high evaporation rates require modifications to WATER RES-1 to maximize generation on high temperature days while maintaining compliance with the annual water use limit.

CONCLUSION AND ORDER

The California Energy Commission hereby adopts Staff's recommendations and approves the following changes to the Commission Decision for the SMUD Cosumnes Power Project. New language is shown as **bold and underlined**, and deleted language is shown in ~~strikeout~~.

CONDITIONS OF CERTIFICATION

AQ-17 Emissions from the following equipment shall not exceed the following limits, not including periods containing start-ups and short-term excursions as defined in condition AQ-26.

Pollutant	Maximum Allowable Emissions	
	CTG #1 (lbs./hr)	CTG #2 (lbs./hr)
NO _x	13.51 (a)	13.51 (a)
CO	16.46 (b)	16.46 (b)
ROC	3.30 (c)	3.30 (c)
SO _x	4.34 <u>1.67</u> (d)	4.34 <u>1.67</u> (d)

PM10	9.00 (e)	9.00 (e)
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- (a) Based on data submitted in the application and is monitored by the turbine's NOx CEM system (1 hour average).
- (b) Based on data submitted in the application and is monitored by the turbine's CO CEM system (3 hour average)
- (c) Based on a turbine ROC emission factor of 0.00177 lb/mmbtu and firing at full capacity.
- (d) Based on a turbine SO_x emission factor of 0.00071 lb/mmbtu and firing at full capacity aggregate usage of 2,500 scfm (92.63 mmbtu/hr) digester gas (4.626577E-3 SO_x/mmbtu) and 1,772.37 mmbtu/hr natural gas (7.00967E-4 SO_x/mmbtu).
- (e) Based on a turbine PM10 emission factor of 0.00483 lb/mmBTU and firing at full capacity.

Verification: As part of the quarterly and annual compliance reports, the project owner shall include information on the date, time, and duration of any violation of this permit condition.

AQ-18 Emissions of NOx, CO, ROC, SOx, and PM10 from Phase 1 of the CPP facility including start-ups and shut-downs shall not exceed the following limits.

Pollutant	Maximum Allowable Emissions (lbs./day)			
	CTG #1	CTG #2	Cooling Tower	Total
NOx	523.7	523.7	NA	1,047.4
CO	3,051.7	3,051.7	NA	6,103.3
ROC	117.3	117.3	NA	234.6
SOx	<u>31.440.1(a)</u>	<u>31.440.1(a)</u>	NA	<u>62.971.6(a)</u>
PM10	216.0	216.0	<u>7.413.9(b)</u>	<u>439.4445.9(b)</u>

(a) Facility SOx equates to the total usage of the proposed natural gas/digester gas mixture.

Individual turbines equate to the total usage of the digester gas and balance natural gas.

(b) Values of PM10 reflect changes to cooling tower TDS change.

Verification: As part of the quarterly and annual compliance reports, the project owner shall include information on the date, time, and duration of any violation of this permit condition.

AQ-19 Emissions of NOx, CO, ROC, SOx, and PM10 from Phase 1 of the CPP facility including start-ups and shut-downs shall not exceed the following limits.

Pollutant	Maximum Allowable Emissions				
	Qtr 1 (lbs./quarter)	Qtr 2 (lbs./quarter)	Qtr 3 (lbs./quarter)	Qtr 4 (lbs./quarter)	Total (lbs./year)
NOx	62,021	62,643	63,265	63,265	251,194
CO	147,929	148,687	149,444	149,444	595,505
ROC	14,807	14,958	15,110	15,110	59,986
SOx	<u>5,405</u> 6,190	<u>5,465</u> 6,259	<u>5,525</u> 6,328	<u>5,525</u> 6,328	<u>21,922</u> 25,105
PM10(a)	<u>39,550</u> 40,137	<u>39,989</u> 40,582	<u>40,428</u> 41,028	<u>40,428</u> 41,028	<u>160,395</u> 162,775

(a) Values reflect changes to cooling tower TDS change and perlite storage silo addition.

Verification: As part of the quarterly and annual compliance reports, the project owner shall include information on the date, time, and duration of any violation of this permit condition.

AQ-24 The total dissolved solids content of the circulating cooling water shall not exceed 800**1,500** ppmw, averaged over any consecutive three-hour period.

Verification: The project owner shall include information on the date, time, and duration of any violation of this permit condition in the quarterly and annual reports.

AQ-32 The CPP shall operate a continuous monitoring system that has been approved by the Air Pollution Control Officer that either measures or calculates and records the following:

Parameter to be monitored	Units
Fuel consumption of each combined cycle turbine.	Mmbtu/hr of natural gas/ <u>digester gas combination</u>
Exhaust gas flow rate of turbine and duct burner.	Kscfh or lb/hr
Total dissolved solids content of the circulating water in the cooling towers.	PPMW

Verification: At least sixty (60) days prior to purchase of the continuous monitoring system, the project owner shall submit to the District, for approval, and to the CPM, for review, a copy of the manufacturer specifications for the continuous monitoring system, which demonstrates compliance with the District's monitoring requirements.

AQ-33 The following record shall be continuously maintained on site for the most recent five-year period and shall be made available to the Air Pollution Control Officer

upon request. Quarterly and yearly records shall be made available for inspection within 30 days of the end of the previous quarter or year respectively.

Frequency	Information to be recorded
General	<ul style="list-style-type: none"> A. Record of the occurrence and duration of any start-up, short-term excursion, or shut-down. B. Malfunction in operation of each turbine. C. Measurements from the continuous monitoring system. D. Monitoring device and performance testing measurements. E. All continuous monitoring system performance evaluations. F. All continuous monitoring system or monitoring device calibration checks. G. All continuous monitoring system adjustments and maintenance.
Hourly	<ul style="list-style-type: none"> A. Each combined cycle turbine's natural gas and digester gas combination fuel consumption (mmbtu/hr). B. Indicate when each combined cycle turbine start-up/shut-down occurred. C. Each combined cycle turbine's NO_x, CO, ROC, SO_x, and PM₁₀ hourly mass emissions. For those pollutants directly monitored (NO_x and CO), the hourly mass emissions shall be calculated based on concentration measurements from the CEM system required pursuant to condition AQ-31. For those pollutants that are not directly monitored (ROC, SO_x, and PM₁₀), the hourly mass emissions shall be calculated based on District approved emission factors contained in footnotes to condition AQ-17. D. Each combined cycle turbine's NO_x and CO concentration measured in ppmvd at 15% O₂. E. Total dissolved solids content of the circulating water in the cooling towers in ppmw. F. Cooling tower hourly PM₁₀ mass emission rate. The hourly emissions shall be calculated based on the cooling water circulation rate multiplied by the cooling tower drift rate, density of water, and the measured TDS level.
Daily	Total facility NO _x , CO, ROC, SO _x , and PM ₁₀ daily mass emissions.
Quarterly	Total facility NO _x , CO, ROC, SO _x , and PM ₁₀ quarterly mass emissions.

Verification: All quarterly and annual reports shall be maintained on site for a minimum of five (5) years and shall be provided to the CPM or District personnel upon request.

AQ-36A NO_x, ROC, CO, SO_x, PM₁₀, ammonia, and CEM accuracy source test of each combined cycle turbine shall be performed once each calendar year. The Air

Pollution Control Officer may waive the annual PM10 and/or ROC source test requirement if, in the Air Pollution Control Officer's sole judgment, prior test results indicate an adequate compliance margin has been maintained.

- A. The project owner shall submit a test plan to the Air Pollution Control Officer for approval at least 30 days before the source test is to be performed.
- B. The Air Pollution Control Officer shall be notified at least 7 days prior to the emission testing date.
- C. During the test(s), each turbine is to be operated at its maximum firing capacity defined as $\geq 90\%$ of rated heat input capacity and taking into account ambient conditions.
- D. The source test results shall be submitted to the Air Pollution Control Officer within 60 days from the completion of the source test(s).
- E. **Source testing shall occur with a representative flow of digester gas into the pipeline feeding the fuel supply to the turbine being tested so that the turbine being tested is using the digester gas.**

Verification: The project owner shall notify the District and the CPM within 7 working days prior to the planned source testing date. The source test results shall be submitted to the District and the CPM within 60 days from the completion of the source test.

AQ-44 and AQ-45 pertain to the incorporation of digester fuel into the fuel supply:

AQ-44 The use of digester gas used at the Cosumnes Power Plant is restricted to 2,500 scfm and shall not commence until approval of the Acid Rain Program Petition.

Verification: The project owner shall include information on the date, time, and duration of any violation of this permit condition in the quarterly and annual reports.

AQ-45 The digester gas used at this facility shall not exceed 50 ppm of H₂S, measured prior to the commingling with the natural gas.

Verification: The project owner shall include information on the date, time, and duration of any violation of this permit condition in the quarterly and annual reports.

AQ-46 to AQ-53 pertains to the installation of the perlite Storage Silo and attached APC Dust Collector Cyclonaire. AQ-53 also reflects the increase in PM10 emissions from the cooling tower:

AQ-46 The process shall not discharge into the atmosphere any visible air contaminants for a period or periods aggregating more than three minutes

in any one hour, which are as dark or darker than ringelmann no. 1 or equivalent to or greater than 20% opacity.

Verification: The project owner shall include information on the date, time, and duration of any violation of this permit condition in the quarterly and annual reports.

AQ-47 The emissions from the dust collector shall not exceed the following limit:

<u>Pollutant</u>	<u>Maximum Allowable Emissions (A)</u>
	<u>Quarterly (lb/quarter)</u>
<u>PM10</u>	<u>2.6</u>

(A) Based on maximum capacity 26 hours/qtr, and particulate emissions of 0.02 gr/dscf at 585 cfm.

Verification: The project owner shall include information on the date, time, and duration of any violation of this permit condition in the quarterly and annual reports.

PROCESS OPERATION

AQ-48 The dust collector shall be equipped with a pressure differential gauge to indicate the pressure drop across the bags. The average pressure drop shall not exceed the manufacturer's recommendation.

Verification: The project owner shall include information on the date, time, and duration of any violation of this permit condition in the quarterly and annual reports.

AQ-49 The dust collector cleaning frequency and duration shall follow the manufacturer's recommendations.

Verification: The project owner shall include information on the date, time, and duration of any violation of this permit condition in the quarterly and annual reports.

AQ-50 Total perlite delivered to the silo per quarter cannot exceed 101.4 tons.

Verification: The project owner shall include information on the date, time, and duration of any violation of this permit condition in the quarterly and annual reports.

RECORD KEEPING

AQ-51 The following record shall be continuously maintained on site for the most recent five-year period and shall be made available to the air pollution

control officer upon request. Quarterly and yearly records shall be made available for inspection within 30 days of the end of the previous quarter or year respectively.

<u>Frequency:</u>	<u>Information to be recorded:</u>
<u>Quarterly</u>	<u>Total perlite delivered to the silo (tons/qtr)</u>

Verification: The project owner shall include information on the date, time, and duration of any violation of this permit condition in the quarterly and annual reports. The owner shall make the records available to the CPM upon request.

EMISSION OFFSETS

AQ-52 The following table depicts the PM10 emission increase that will require to be offset.

<u>Pollutant</u>	<u>Qtr1 lb/qtr</u>	<u>Qtr2 lb/qtr</u>	<u>Qtr3 lb/qtr</u>	<u>Qtr4 lb/qtr</u>
<u>PM10</u>	<u>2.6</u>	<u>2.6</u>	<u>2.6</u>	<u>2.6</u>

Verification: The project owner shall include information on the date, time, and duration of any violation of this permit condition in the quarterly and annual reports.

AQ-53 ERC 07-01030 is expected to be surrendered in accordance with SMAQMD Authority to Construct 22702 and 22672.

	<u>Face value of certificates surrendered</u>					<u>Value applied to the emission liability</u>			
<u>From erc 1030</u>	<u>Qtr1</u>	<u>Qtr2</u>	<u>Qtr3</u>	<u>Qtr4</u>	<u>Offset ratio</u>	<u>Qtr1</u>	<u>Qtr2</u>	<u>Qtr3</u>	<u>Qtr4</u>
<u>Erc's surrendered</u>	<u>262</u>	<u>267</u>	<u>270</u>	<u>270</u>	<u>1.5</u>	<u>174.6</u>	<u>177.6</u>	<u>179.6</u>	<u>179.6</u>

Notes: The quantities of ERCs include the increase in PM10 emissions from the cooling tower as required by SMAQMD. For CEQA purposes, a surplus of ERC's provided in ATCs 22673 and 22674 would be used to offset Staff recommended mitigation as discussed in Air Quality Table 7.

Verification: Prior to operation of the equipment, the project owner shall provide valid emission reduction credits specified in AQ-53 to the District for approval and to the CPM for review.

WATER RES-1 Total water use by the project owner for the operation of the project and all landscape irrigation of the CPP site shall not exceed an annual average of

2,663 AFY over any three successive calendar years, ~~not exceed a peak flow of 2,500 gpm.~~

Verification: The owner shall maintain daily records of water use from each source (FSC, Rancho Seco Reservoir and/or reclaimed if used) and as part of its annual compliance report shall submit a water use summary to the CPM on an annual basis for the life of the project. ~~The owner shall track its water use (from any source) on a daily basis and shall notify the CPM immediately upon exceeding, or upon forecast to exceed, the peak flow of 2,500 gpm.~~ The annual average 2,663 AFY shall be calculated based upon any consecutive three-year period starting with the first full calendar year of operation and shall not exceed the average annual consumption for any three consecutive years for the life of the project.

CERTIFICATION

The undersigned Secretary to the Commission does hereby certify that the foregoing is a full, true and correct copy of a Resolution duly and regularly adopted at a meeting of the California Energy Commission held on November 2, 2011

AYE: Weisenmiller, Douglas, Peterman

NAY: None

ABSENT: Boyd

ABSTAIN: None



HARRIET KALLEMEYN

Secretariat