



**Air Pollution Control Board**  
Greg Cox            District 1  
Dianne Jacob       District 2  
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October 17, 2007

via certified US Mail

TIM HEMIG  
VICE PRESIDENT  
CARLSBAD ENERGY CENTER  
1817 ASTON AVE 101, SUITE 104  
CARLSBAD, CA 92008

Application Nos. 985745, 985746, 985747, and 985748

### APPLICATION STATUS

Your applications for Authorities to Construct for two new 279 MW combined cycle turbines (Encina Units Nos. 6 and 7) and one new 246 HP emergency fire pump for the Carlsbad Energy Center Project (CECP) located at the Encina Power Plant facility at 4600 Carlsbad Boulevard, Carlsbad California, were received on September 17, 2007, and assigned Application Nos. 985745, 985746 and 985748, respectively. In addition, your application to modify operations of three existing boilers having Permits to Operate Nos. 791, 792, and 793 as part of the CECP, also located at the Encina Power Plant, was received on September 17, 2007, and is assigned Application No. 985747. After initial review of the information submitted with the application and additional supplemental information submitted by you in a letter dated October 10, 2007, and an email dated October 12, 2007, the District has determined that Applications Nos. 985745, 985746, 985747, and 985748 are complete for purposes of Rule 18 Section (a), effective October 17, 2007.

However, pursuant to Rule 23 the District has determined that there are elements within the application which need clarification, amplification, or additional information in order to efficiently process the application. These elements are listed below (unless otherwise noted, references refer to the supporting documentation accompanying the application submittal) and will require a written response from the applicant to be submitted to the District no later than November 16, 2007. If more time is needed to prepare a complete response, please contact the District. Please be advised that, pursuant to District Rules 14, 17, and 23, additional information may be requested in the future as evaluation of the application proceeds.

### BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

Please provide an estimate of potential particulate emissions resulting from the use of reclaimed water in the evaporative cooler at the combustion turbine inlet. Also, provide the basis of the reclaimed water composition listed in Table 5.15F-1 in Appendix 5.15E.

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### **OPERATIONS ON LNG DERIVED GAS**

It is likely that the this turbine may be operated continuously or intermittently on natural gas derived from imported liquefied natural gas with a significantly different composition than the natural gas historically used in San Diego. In particular, the gas may have significantly higher amounts of ethane and propane relative to methane resulting in a significantly higher Wobbe No. for the fuel. Please provide the following information from the combustion turbine manufacturer:

1. The latest fuel specification for the turbine model specified in the application.
2. A guarantee that the combustion turbine in combination with the add-on emission control system will be able to meet the proposed exhaust stack emission limits in the application when operated over the expected Wobbe No. range of 1335–1385 and a description of the any measures and ancillary equipment needed to achieve this guarantee.
3. The maximum allowable amount of ethane, propane, and/or higher hydrocarbons in the fuel that the combustion turbine in combination with the add-on emission control system can tolerate and still meet the proposed emission limits in application.
4. The maximum allowable rate of change in Wobbe No. that the combustion turbine in combination with the add-on emission control system can tolerate and still meet the proposed emission limits in application.
5. The maximum allowable rate of change in ethane, propane, and/or higher hydrocarbons fuel content that the combustion turbine in combination with the add-on emission control system can tolerate and still meet the proposed emission limits in application.

### **AIR QUALITY IMPACT ANALYSIS (AQIA) AND HRA MODELING**

#### **AQIA Model**

It appears that the air impact modeling was done using AERMOD version 06341. The latest version of AERMOD is version 07026, which was released in January of this year. If the air impact modeling was done using AERMOD version 06341, please resubmit the air impact modeling using the latest version of AERMOD or provide a demonstration that, for purposes of this project, AERMOD version 06341 and AERMOD version 07026 give the same results.

#### **AQIA Analysis**

On page 5.1-48, it is stated that, since the maximum background level of PM<sub>10</sub> already exceeds the state 24-hour standard, the test for a significant impact is based on the whether the project emissions exceed the prevention of significance deterioration (PSD)

significant impact levels (SILs). However, under District Rule 20.3 (d)(2), it must be demonstrated that the project will not cause any additional exceedances of an ambient air quality standard. When the background exceeds an annual ambient air quality standard, it may be appropriate to use the SIL to determine if a significant impact has occurred. However, this is not true for ambient air quality standards with shorter averaging times. In this case, the District requires an analysis considering the impacts on days when the background concentration does not exceed the standard. Please provide such an analysis for the impact of PM<sub>10</sub> with respect to the state 24-hour standard. The District meteorology staff should be contacted for details of the analysis procedure.

In addition, please provide the following information:

1. A key to identify all of the source groups used in the AERMOD calculations. In addition, provide a plain language summary of the electronic files submitted with the application so that they can be easily related to the information in the report. The summary should include a description of each source group being modeled.
2. Confirm that air quality impact calculations were made without considering emissions decreases from the eventual retirement of the three existing boilers.

#### **HRA Analysis**

Please provide the following information and clarifications:

1. Explain why cancer risk is calculated using more than the Office of Environmental Health Hazard Assessment (OEHHA) Derived (Adjusted) Method. It makes the review process more cumbersome and makes it more difficult for the public to evaluate the analysis and report. Moreover, it results in much lengthier AERMOD model runs and reports than are needed.
2. A key to identify all of the source groups used in the AERMOD calculations. In addition, provide a plain language summary of the electronic files submitted with the application specifically for the health risk assessment so that they can be easily related to the information in the report. The summary should include a description of each source group being modeled.
3. Information on whether health risk calculations were made with or without considering emissions decreases from the eventual retirement of the three existing boilers.
4. A separate calculation of health risk for startup and commissioning activities and an explanation as to how this risk was analyzed and incorporated into the overall health risk estimates including a description of exactly which commissioning activities were analyzed. If estimates of health risk under these conditions are expected to be negligible, this needs to be clearly demonstrated.
5. Identification of the computer file(s) that contain the maximum health risk impacts will be found. Health risk results should not just be stated, but should be clearly referenced.

### **Startup, Shutdown, and Commissioning**

Since this plant is being proposed as a large power plant that is anticipated to undergo many startups and shutdowns during the year, it is important to have the most accurate information possible to model the air quality impact during startups and shutdown. In addition, it is also important to have the most accurate information possible during the commissioning period since, although of short duration on an annual basis, commissioning emissions may be much larger than during normal operations. Therefore, please provide the following actual or estimated/projected information for the combustion turbine.

1. Representative measured or calculated minute-by-minute exhaust stack temperature, fuel flow rate, oxygen content, and turbine load and controlled and uncontrolled carbon monoxide (CO) emissions, volatile organic compound (VOC) emissions, and oxides of nitrogen (NO<sub>x</sub>) emissions during a representative warm startup (overnight or shorter shutdown), cold startup (weekend shutdown) and supporting information. The data should extend until the steam turbine has reached full load.
2. Representative measured or calculated minute-by-minute exhaust stack temperature, fuel flow rate, oxygen content, and turbine load and controlled and uncontrolled CO emissions, VOC emissions, and NO<sub>x</sub> emissions during a representative shutdown and supporting information.
3. The basis for assuming that CO emissions are reduced by 20% during the first 12 minutes of a startup and by 90% during the final 10 minutes of a startup during normal operations (Table 5.1 B-8).
4. The approximate minimum load at which the combustion turbine is able to achieve the proposed best available control technology emission limits for NO<sub>x</sub> and CO.
5. During combustion turbine commissioning operations without add-on air pollution control equipment in place, exhaust stack temperature and oxygen content when the turbine is operating at full speed no load, 10% load, 25% load, and 40% load.
6. Details of combustion turbine commissioning activities indicating the approximate amount time in each operating mode during the activity.

### **TOXIC AIR CONTAMINANT EMISSION FACTORS**

#### **Maximum Hourly Emission Rates**

The footnotes to Table 5.9B-1 indicate that the emission factors for acrolein, benzene, and formaldehyde are based on Table 3.1-1 in EPA's AP-42 emission factor compilation. In addition, the footnotes indicate that no control factor for the oxidation catalyst has been applied to these emission factors to account for startups when the oxidation catalyst may have less or no effectiveness.

October 17, 2007

However, a comparison of Table 5.9B-1 to Table 3.1-1 in AP-42 indicates that control factors of approximately 50%, 75%, and 50% have been applied to the AP-42 acrolein, formaldehyde, and benzene emission factors, respectively, to generate the emission factors in Table 5.9B-1. At a minimum (see below), please revise the hourly emission rates in Table 5.9-1 and the health risk assessment to reflect no emission control factor for acrolein, formaldehyde, and benzene or provide a justification of the control factors used.

The District also notes that the AP-42 emission factors or emission factors measured at high loads for toxic air contaminants may not be applicable to operations at low load operations that occur during startup, shutdown, and commissioning operations. The District may request the use of alternative emission factors for some air pollutants during low load operations. The District recommends providing any available test information for toxic air contaminant emissions for the model of combustion turbine proposed in the application, or a similar model, when operating at low load (i. e., not in the lean-premix combustion mode).

#### **Annual Emission Rates**

A comparison of Table 5.9B-1 to Table 3.1-1 in AP-42 indicates that control factors of approximately 50%, 75%, and 50% have been applied to the AP-42 acrolein, formaldehyde, and benzene emission factors to generate the annual emission rates listed in Table 5.9B-1. Please revise the annual emission rates in Table 5.9-1 and the health risk assessment to reflect no emission control factor for acrolein, formaldehyde, and benzene or provide a justification of the control factors used.

Please be advised that to evaluate the application the District may use suitably conservative assumptions or information from similar types of equipment in place of elements of the above requested information if the requested information is not available or not provided in a timely manner. In addition, changes in emission estimates may require the reassessment of the project's ambient air quality impacts and health risk assessment.

This is not a Permit to Operate. If you have any questions concerning the above, please contact me at (858) 586-2750.



Steven Moore  
Senior Air Pollution Control Engineer

cc: James W. Reede, Jr., Ed.D., California Energy Commission