

DOCKETED

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South Coast Air Quality Management District

21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

December 2, 2016

Kara Miles
President
Stanton Energy Reliability Center, LLC
650 Bercut Drive, Suite A
Sacramento, CA 95811

Subject: Permit Applications for the Stanton Electric Reliability Center (16-AFC-01),
located at 10711 Dale Avenue, Stanton, CA 90680 (Facility ID# 183501)

Dear Ms. Miles:

The South Coast Air Quality Management District (SCAQMD) received permit applications for the proposed Stanton Energy Reliability Center (SERC) on November 2, 2016. As a first step in our review process, we have briefly reviewed the Permit Application for the Stanton Electric Reliability Center, October 2016 (Application) to determine whether the applications are complete and ready for review. Based on our initial review of the submitted materials it has been determined that the application package is incomplete. The reference application numbers for this project and our initial review determination are provided in the table below:

Application	Equipment Description	Completeness Determination
589974	Initial Title V	Deemed Incomplete
589935	Simple Cycle Turbine	Deemed Incomplete
589936	Simple Cycle Turbine	Deemed Incomplete
589937/589939*	SCR/CO Catalyst	Deemed Incomplete
589938/589940*	SCR/CO Catalyst	Deemed Incomplete
589941	Ammonia Tank, Aqueous	Deemed Incomplete

*SCR/CO Catalyst should be one application.

Please be aware that, in addition to the information required below, other information may be needed during the course of our full engineering evaluation. Your cooperation is key to the timely review of the applications. The following issues have been identified during the completeness review:

1. NO_x Emissions/RECLAIM Facility

On pg. 5.1-9 of the Application, *Table 5.1-6—Combustion Turbine Emissions (Startup and Steady State Operation Per Turbine)* indicates the maximum annual emissions for NO_x are 1.94 tpy per turbine. On pg. 5.1-10, *Table 5.1-8—Two Combustion Turbine Emissions (full Load, Startup and Shutdown, whichever is Greater) for the Non-Commissioning Year* indicates that for the two turbines, the maximum annual emissions of NO_x are 3.89 tpy. Pg. 5.1-10 indicates that the maximum annual emissions for a commissioning year will not exceed the maximum annual emissions for a non-commissioning year. The Application concluded that SERC is not subject to RECLAIM.

For *Table 5.1-6*, footnote d indicates the maximum annual emissions for NO_x are based on Case 1 (e.g., 500 starts and 716 full load hrs per turbine). Footnote e indicates these emissions are based on “annual average emissions factor” of 2.0 ppmvd at 15% O₂. In *Appendix 5.1A—Support Data for Emissions Calculations*, the *Combustion Turbine Operating Emissions and Support Data* table indicates that for Case 103 (average ambient), the emission rate for 2.0 ppm is 3.44 lb/hr and the emission rate for 2.5 ppm is 4.30 lb/hr.

On pg. 5.1-9, *Table 5.1-7—Startup and Shutdown Emissions (per event per turbine)* shows that the NO_x emissions are 3.08 lb/startup and 1.0 lbs/shutdown. In *Appendix 5.1A*, the *Startup & Shutdown Emissions Summary* table indicates that for NO_x, the startup rate for short-term emissions and permit limits is 3.08 lb/startup, and the startup rate for monthly and annual emissions calculations is 1.85 lb/startup. The shutdown rate is 1.0 lb/shutdown for the short-term emissions, permit limits, and monthly and annual emissions calculations.

Apparently, the 3.89 tpy for the two turbines was calculated as follows:

$$[(716 \text{ hr/yr full load})(3.44 \text{ lb/hr at 2.0 ppm}) + (500 \text{ startups/yr})(1.85 \text{ lb/start at the reduced rate}) + (500 \text{ shutdowns/yr})(1.0 \text{ lb/shutdown}) \text{ per turbine}] * [2 \text{ turbines}] * [\text{ton}/2000 \text{ hr}] = 3.89 \text{ tpy}$$

The above calculations do not comply with SCAQMD emissions calculation methodology.

- One, the emission rate for normal operation is required to be based on a BACT limit that the turbines can meet at all times. On pg. 5.1-16, *Table 5.1-15—Proposed BACT for the Combustion Turbines* proposes 2.5 ppmvd short term and 2.0 ppmvd long term for NO_x. There cannot not be more than one BACT limit. If the turbines are not capable of meeting 2.0 ppm at all times, except during startups and shutdowns, the emission rate is required to be based on 2.5 ppm BACT (1-hour average).
- Two, the startup rate is required to be based on a startup rate that the turbines can meet at all times. If the turbines are not capable of meeting 1.85 lb/startup at all times, the startup rate is required to be based on the proposed permit limit of 3.08 lb/startup.

The corrected emissions calculations are as follows:

$$[(716 \text{ hr/yr full load})(4.30 \text{ lb/hr at 2.5 ppm BACT}) + (500 \text{ startups/yr})(3.08 \text{ lb/start, permit limit}) + (500 \text{ shutdowns/yr})(1.0 \text{ lb/shutdown})] * [2 \text{ turbines}] * [\text{ton}/2000 \text{ hr}] = 5.12 \text{ tpy} > 4 \text{ tpy RECLAIM threshold}$$

- a. The applicant has two options: (1) maintain the proposed operating schedule and enter into RECLAIM, or (2) reduce the operating schedule to stay under 4.0 tpy NO_x. Which option does the applicant select?
 - b. If the applicant selects the option of reducing the operating schedule, please revise the Application to reflect the new proposed schedule.
2. Startup Emissions
On pg. 5.1-9, *Table 5.1-7—Startup and Shutdown Emissions (per event per turbine)* also lists the lbs/startup for CO, VOC, PM₁₀/PM_{2.5}, and SO_x. In *Appendix 5.1A*, the *Startup & Shutdown Emissions Summary* table shows proposed startup permit limits that are the same as

in *Table 5.1-7*. The listed startup emissions for monthly and annual emissions calculations, however, are substantially lower.

- a. As discussed for NO_x above, the monthly and annual emissions calculations for CO, VOC, and PM₁₀ are required to be based on startup emissions that the turbines can meet at all times. Please revise the monthly and annual emissions calculations for CO, VOC and PM₁₀ to be based on the proposed startup permit limits.
- b. For SO_x, the monthly emissions are required to be based on 0.75 gr S/100 scf for normal operation and startup. The annual emissions may be based on 0.25 gr S/100 scf for normal operation and startup, if the facility will accept a permit condition for monthly testing of the natural gas. (The guidance for monthly calculations are shown in a separate question below.) The *Startup & Shutdown Emissions Summary* table shows a proposed permit limit of 0.19 lb/startup but the monthly and annual emissions calculations are based on 0.02 lb/startup. Please revise the monthly and annual emissions calculations for SO_x in accordance with the above guidance.

3. Shutdown Emissions

The *Startup & Shutdown Emissions Summary* table also lists lbs/shutdown for CO, VOC, PM₁₀/PM_{2.5}, and SO_x. For CO and VOC, the shutdown emissions are the same for the permit limits and the monthly and annual emissions calculations. For PM₁₀ and SO_x, the shutdown emissions are lower for the monthly and annual emissions calculations (0.04 lb/shutdown for PM₁₀ and 0.01 lb/shutdown for SO_x) than for the proposed limits (0.5 lb/shutdown for PM₁₀ and 0.02 lb/shutdown for SO_x).

- a. For PM₁₀, please revise the monthly and annual emissions calculations to be based on the proposed shutdown permit limit.
- b. For SO_x, the monthly emissions are required to be based on 0.75 gr S/100 scf for shutdown. The annual emissions may be based on 0.25 gr S/100 scf for shutdown. Please revise the monthly and annual emissions calculations for SO_x in accordance with the above guidance.

4. PM₁₀/PM_{2.5} Normal Operation Emission Rate

- a. For *Table 5.1-6*, footnote f indicates the short-term emissions are based on 3 lb/hr PM₁₀ and the annual emissions on 1.93 lb/hr PM₁₀. Since the Application calculated the monthly emissions by dividing the annual emissions by 12 months, the monthly emissions were also based on 1.93 lb/hr. Please revise the monthly and annual emissions to be based on the 3 lb/hr.

5. BACT Level for CO and VOC

- a. *Table 5.1-6* indicates the CO emission rates are based on a BACT level of 4.0 ppmvd @ 15% O₂. Please revise the monthly and annual emissions for CO to reflect the current BACT level of 2.0 ppmvd @ 15% O₂.
- b. *Table 5.1-6* indicates the VOC emission rates are based on a BACT level of 1 ppmvd @ 15% O₂. Please revise the monthly and annual emissions for VOC to reflect the current BACT level of 2.0 ppmvd @ 15% O₂.

6. Monthly Emissions Calculations for ERCs

Pg. 5.1-12 of the Application indicates no offsets are required for PM₁₀/PM_{2.5}, VOC and SO₂ based on the annual emissions provided in the Application. As explained in questions 1 – 5 above, the annual emissions for NO_x, CO, VOC, PM₁₀/PM_{2.5}, and SO_x are required to be recalculated.

Further, pursuant to New Source Review requirements, offsets are based on the maximum monthly emissions and 30-day averages for each pollutant, not on maximum annual emissions. The maximum monthly emissions are based on the highest emissions of any month, including commissioning month(s), combination commissioning/normal operating month, and normal operating month. The maximum monthly emissions for CO, VOC, PM₁₀/PM_{2.5}, and SO_x establish a basis for calculating offset requirements and will be enforced by permit condition.

a. Maximum Monthly Emissions for Commissioning Month or Combination Commissioning/Normal Operating Month

i. In *Appendix 5.1A*, the *Commissioning Emissions* table indicates the commissioning will take 100 hrs and provides commissioning emissions.

aa. First Month

- (1) Please explain which of the six commissioning steps will be completed.
- (2) If normal operations will also take place, how many hours and startups/shutdowns?

bb. Second Month

- (1) Please explain which of the six commissioning steps will be completed.
- (2) If normal operations will also take place, how many hours and startups/shutdowns?

b. Maximum Monthly Emissions for Normal Operating Month

In *Appendix 5.1A*, the *Maximum Annual & Monthly Emissions* table determines the monthly emissions by dividing the maximum annual emissions by 12 months. Typically, for a power plant, the average monthly emissions are not the maximum monthly emissions because the maximum monthly emissions occur in the summer months.

- i. Please provide the maximum number of normal operating hours and startups/shutdowns for the maximum monthly emissions.
- ii. Please provide emissions calculations.

7. Toxic Emissions Factors

In *Appendix 5.1A*, *Table 5.1A-4--Calculation of Hazardous and Toxic Pollutant Emissions from Combustion Turbines* shows the toxic emission factors and emissions calculations.

- a. Please use the toxic emission factors shown in the following table.

Simple-Cycle Turbine Toxic Air Contaminants/Hazardous Air Pollutants

Compound	CAS	TAC/HAP	Emission Factor ¹ (Lb/MMBtu)
Ammonia ⁵	766417	TAC	
Acetaldehyde ²	75070	TAC & HAP	1.76E-04
Acrolein ²	107028	HAP & TAC	3.62E-06
Benzene ²	71432	HAP & TAC	3.26E-06
1,3-Butadiene	106990	HAP & TAC	4.3E-07
Ethylbenzene	100414	HAP & TAC	3.2E-05
Formaldehyde ²	50000	HAP & TAC	3.6E-04
Hexane	110543	HAP & TAC	Not available
Naphthalene	91203	HAP & TAC	1.3E-06
PAHS (excluding naphthalene) ^{3,4}	1151	HAP & TAC	(2.2E-06 – 1.3E-06) * 0.5 = 0.45E-06
Propylene (propene) ⁵	115071	TAC	Not available
Propylene Oxide	75569	HAP & TAC	2.9E-05
Toluene	108883	HAP & TAC	1.3E-04
Xylene	1330207	HAP & TAC	6.4E-05

¹ Emission factors based on AP-42, Section 3.1, Final Section, Table 3.1-3 Emission Factors for Hazardous Air Pollutants from Natural Gas-Fired Stationary Gas Turbine (Uncontrolled), April 2000, unless otherwise noted in footnote 2.

² Acetaldehyde, acrolein, benzene, and formaldehyde emission factors are based on AP-42, Section 3.1, Background Information, Table 3.4-1-- Summary of Emission Factors for Natural Gas-Fired Gas Turbines, April 2000. These emission factors include control by CO catalyst.

³ Carcinogenic PAHs only. Naphthalene was subtracted from the total PAHs and considered separately in the HRA.

⁴ Per Section 3.1.4.3 of AP-42, PAH emissions were assumed to be controlled by 50 percent by the oxidation catalyst.

⁵ Ammonia and propylene are toxic air contaminants for the purpose of Rule 1401, but not federal hazardous air pollutants.

b. Please revise the proposed health risk assessment to incorporate the above emission factor changes.

8. Modeled Emission Rates

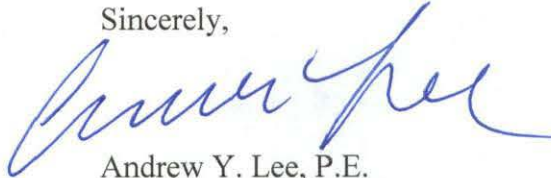
My modeling review request memo to SCAQMD Planning, Rule Development & Area Sources (PRDAS) staff to review the dispersion modeling analysis provided in the Application will include the emission rates for each pollutant and averaging period for the various scenarios. *Table 5.1-20—Worst-Case Stack Parameters and Emission Rates* on pg. 5.1-26, and the *Short-Term Emissions* table in *Appendix 5.1A* provide such information.

a. In light of the guidance provided in questions 1-5 above, please re-evaluate whether the emission rates for each pollutant and averaging period are correct.

b. If not, please revise the dispersion modeling as appropriate.

Please feel free to contact me at (909) 396-2643, or alee@aqmd.gov, or our assigned engineer for this project Ms. Vicky Lee (909) 396-2284 or vlee1@aqmd.gov for further information or clarification.

Sincerely,



Andrew Y. Lee, P.E.
Sr. Engineering Manager
Engineering and Permitting

AYL:BC:VL

cc: Laki Tisopulos
John Heiser, CEC (John.Heiser@energy.ca.gov)
Gregory Darvin (darwin@atmosphericdynamics.com)