March 30, 2012

Mr. Eric Solorio  
California Energy Commission  
Docket No. 11-AFC-3  
1516 9th St.  
Sacramento, CA 95814

Cogentrix Quail Brush Generation Project - Docket Number 11-AFC-3, CEC SCR Process Conference Call Notes and Responses (March 20, 2012 Technical Conference Call)

Docket Clerk:

Pursuant to the provisions of Title 20, California Code of Regulation, and on behalf of Quail Brush Genco, LLC, a wholly owned subsidiary of Cogentrix Energy, LLC, Tetra Tech hereby submits the CEC SCR Process Conference Call Notes and Responses in response to technical questions posed by CEC staff to Tetra Tech on the March 20, 2012 conference call regarding the SCR system. The Quail Brush generation Project is a 100 megawatt natural gas fired electric generation peaking facility to be located in the City of San Diego, California.

If you have any questions regarding this submittal, please contact Rick Neff at (704) 525-3800 or me at (303) 980.3653.

Sincerely,

Constance E. Farmer  
Project Manager/Tetra Tech
## COGENTRIX QUAIL BRUSH PROJECT
### CONFERENCE CALL NOTES

**DATE:** March 30, 2012

**SUBJECT:** California Energy Commission SCR Process and Urea Technical Conference Call

**ATTENDEES:**
- **California Energy Commission**
  - Eric Solorio
  - Rick Tyler
  - Gerry Beamis
  - Joe Hughes
- **Cogentrix**
  - Mark Chaffee
  - John Arnold
  - Greg Krause
- **Tetra Tech**
  - Barry McDonald
  - Sarah McCall

### MEETING NOTES:

1. **Urea to ammonia conversion process discussion**
   - a. Direct injection of 40% urea solution into the flue gas stream.
   - b. Injected between engine and SCR catalyst.
   - c. Just inside the building wall on plant layout.
   - d. This is a principally vanadium, tungsten, and titanium oxide catalyst, similar to any SCR. This is provided by Wartsilla.
   - e. Urea solution is decomposing in flue gas on the way to the SCR. It is upstream and will be well mixed before entering catalyst bed. From the engine wall to SCR is an 18 foot mixing duct with static mixing elements inside.
   - f. Decomposition would break down into ammonia, CO₂ and water. In the past it will break into NH₂ radicals. In terms of the chemistry, we see it getting fully utilized with both NH₂ radicals being effective.
   - g. Urea can be supplied either with or without formaldehyde. Cogentrix will get back to Rick Tyler regarding formaldehyde in the urea used in the past. Cogentrix has not established contracts regarding purchase. From CEC’s standpoint, it could be a condition that would state that the contracts would specify formaldehyde-free urea.
   - h. CEC asked if the CO₂ that would be generated in process was included in the GHG quantification. Barry McDonald will check with Rick Booth and get back to Rick Tyler.
   - i. CEC would also like to check with Rick Booth to determine if there is any SF₆ onsite. Mark Chaffee will check into this and get back to CEC. If there is any SF₆, this needs to be quantified and included in the GHG quantification.
   - j. This will be rolled up through Sarah to provide to CEC.

2. **Summary of CEC requests and Cogentrix responses**
   - a. Rick Tyler was under the impression that the urea solution was decomposed in a separate vessel prior to injection in the engine exhaust gas. John Arnold said that the 40% solution is injected directly into the engine exhaust about 18 feet upstream of the SCR catalyst. He further stated that the 18-foot transition piece between the engine exhaust and the SCR is a static mixer, with internal vanes to ensure uniform distribution of the reagent.
     - i. Response: Attached is a brochure for an SCR supplied on a similar Wartsila installation. Also included is a photograph of a static mixer supplied for the same facility.
b. Rick Tyler asked if the urea solution contained any formaldehyde.
   i. Response: Common urea supply for SCR applications is ultra-high purity
      and is formaldehyde free. Quail Brush will specify that the urea supplied
      will be formaldehyde free.

c. Rick Tyler wants Cogentrix to state that the CO₂ generated as a by-product of the
   urea decomposition process was included in the GHG calculations. Cogentrix
   explained that it is a very tiny amount of CO₂ and while he agreed, he wants to
   be able to say that we were thorough and included it in the calculations.
   i. Response: The 362,780 gallons per year of urea will cause the release of
      484 tons per year (TPY) of CO₂. Combustion of natural gas will cause the
      release of 189,000 TPY of CO₂. Therefore, the urea generated CO₂ will
      increase the overall CO₂ emissions by 0.3%. The urea generated CO₂
      emissions were not included in the original GHG calculations but will be
      added in an upcoming amendment.

      The current levels of GHG emissions are as follows:

      Wartsila engines 189,600 metric tons CO₂e/yr
      Fire pump engine 5.11 metric tons CO₂e/yr
      Heaters (3) 1,953.4 metric tons CO₂e/yr
      SF₆ breaker 31.5 metric tons CO₂e/yr
      Mobile equipment 26 metric tons CO₂e/yr
      Total 191,616 metric tons CO₂e/yr or 210,778 short tons

      New level accounting for a lower SF6 breaker amount and added CO₂ for
      the urea contribution is as follows:

      Wartsila engines 189,600 metric tons CO₂e/yr
      Urea contribution ~441 metric tons CO₂e/yr
      Fire pump engine 5.11 metric tons CO₂e/yr
      Heaters (3) 1,953.4 metric tons CO₂e/yr
      SF₆ breaker 8.96 metric tons CO₂e/yr
      Mobile equipment 26 metric tons CO₂e/yr
      Total 192,034 metric tons CO₂e/yr or 211,237 short

      These changes do not result in any significant changes to CO₂e, and do not
      impact any of the BACT determinations.

d. The CEC asked if there was any SF₆ onsite. If any is used Cogentrix needs to
   include the appropriate calculations in the GHG inventory.
   i. Response: The only equipment containing SF₆ of the Quail Brush
      Generation Project is the High Voltage (138-kV) Circuit Breaker. This
      breaker will be located inside the facility switchyard and connects the high
      side of the generator step-up transformer with the interconnecting 138-kV
      transmission line. The quantity of SF₆ gas in the HVCB will be 75
      poundss. SF₆ is fully discussed in the GHG BACT text in Appendix F.6 of
      the AFC. The discussion is for the 238 kV breaker at 290 pounds of SF₆
      storage. In the current air (GHG) emissions calculations, 290 pounds of
      SF₆ is used because it was based on the 230 kV HVCB associated with
      the initial Point of Interconnection (POI). This quantity has not yet been
      reduced for the 138 kV POI. This text will have to be amended for the
      new breaker at 75 pounds SF₆.