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February 28, 2014

Ms. Dianne Anderson
Air Permits Division
Texas Commission on Environmental Quality
12100 Park 35 Circle, Building C
Austin, Texas 78753

via email

RE: Application for PSD Air Quality Permit
Lon C. Hill Power Station
Corpus Christi, Nueces County
CN602656688; RN100215979

Dear Ms. Anderson:

Lon C. Hill, LP (LCH) appreciates your timely review of our Prevention of Significant Deterioration (PSD) Air Quality permit application for the redevelopment of Lon C. Hill Power Station. LCH received your request for additional information, dated January 31, 2014, and we understand that you require this response within four weeks of the issuance of the NOD letter (i.e., by March 3, 2014).

By way of this letter and attachment, LCH is responding to each of your specific requests. Relevant text from each item in your letter is provided in bold, followed by LCH response in blue font.

Additionally, during this review, LCH has revised the cooling tower system initially proposed. As discussed in the application, LCH is evaluating the possibility of enhancing the performance of the combustion turbines by incorporating either evaporative coolers or inlet chillers. The inlet chiller option will have an associated cooling tower and chilled water storage. This smaller cooling tower was not represented on the original application. Therefore, LCH is requesting authorization for this additional emission source. The updated permit application attached to this letter incorporates this additional cooling tower.

General Application

1. **The Table 1(a) represents the worst case emission rates from the GE scenario only. Each option (GE and Siemens) should be listed separately on the Table 1(a) and should include both normal and MSS emission rates. The Table 1(a) will be used to create a Maximum Allowable Emission Rates table which will list the two option separately. This allows for easy updates in the future once an option is selected. Please provide a revised Table 1(a).**

   The Table 1(a) in the submitted application represents the maximum emission rate for either the Siemens or GE unit for each pollutant and averaging time period, for both normal and MSS

operating scenarios. GE was unable to provide us with the emission rate information related to startup and shutdown scenarios. Therefore, the Siemens information was applied for the MSS startup and shutdown emission rates. In the event that GE is selected as the vendor, they will be required to meet the MSS rates that Siemens provided.

Two additional Table 1(a)s, as requested, were prepared and are provided in Attachment A of the updated application attached to this letter. PI-1 Section IV.F emission rates continue to represent the worst case scenario among the two options evaluated.

2. **Pages 29-30 present duration information about cold, warm, and hot startups and shutdowns of the turbines. The permit will include a definition of each of these types of starts of shutdowns (when the startup/shutdown begins and when it ends). Please provide definitions for the start and end of the different startups and shutdowns. Please see Attachment A for an example.**

A detailed definition of hot, warm and cold startup as provided by Siemens has been incorporated into Section 4.2 of the updated application attached to this letter. Definitions are as follows:

- Cold Startup: A startup after an extended gas turbine (GT) shutdown (SD) of greater than 64 hours, with the steam turbine (ST) HP/IP metal temperatures less than 485 °F (252 °C).
- Warm Startup: A startup after a GT shutdown of 16 to 64 hours, with the ST HP/IP metal temperatures between 485 °F (252 °C) and 685 °F (363 °C).
- Hot Startup: A startup after a GT shutdown of less than 16 hours, with the ST HP/IP metal temperatures greater than ~ 685 °F (363 °C).

A startup is initiated when the Data Acquisition and Handling System (DAHS) detects a flame signal (or equivalent signal) and ends when the permissives for the emission control system are met (i.e., steady state emissions compliance is achieved).

A shutdown begins when the load drops to the point at which steady state emissions compliance can no longer be assured and ends when a flame-off signal is detected.

We have represented a conservative operating scenario that combines hot, warm, and cold startups to achieve the worst case (i.e., maximum emission rate expected from the new facility). This facility will likely be a merchant facility and cannot be operationally constrained to a specific number of hot, warm, or cold startups. Therefore, LCH requests that compliance be demonstrated by maintaining short and long term emission rates below those represented in the permit application, rather than a specific number of hot, warm, and/or cold startups.

3. **The application presents site-wide abrasive blasting and maintenance painting as separate emission points. We highly recommend authorizing these activities under Permit by Rule 106.263 for "Routine Maintenance, Startup and Shutdown of Facilities and Temporary Maintenance Facilities". Authorizing these activities through an NSR permit will require a significant amount of**

work to determine accurate emission rates, conduct modeling, and to demonstrate compliance. Please provide an updated Table 1(a) that does not include these emission sources. Information about this PBR can be found at the following link:
http://www.tceq.state.tx.us/permitting/air/permitbyrule/subchapter-k/mainteance_fac.html

The abrasive blasting and maintenance painting activities will be authorized under Permit by Rule §106.263 for "Routine Maintenance, Startup and Shutdown of Facilities and Temporary Maintenance Facilities", as recommended. These emission points have been removed from the updated application attached to this letter.

Best Available Control Technology

4. **Sections 5.2.2 and 5.2.3 provide BACT information for CO and VOC for the turbines. Typically we see 2 ppmvd on a 24-hour average proposed for both VOC and CO when an oxidation catalyst is being used. Please confirm these concentration limits are acceptable or provide justification for any BACT value different from this for either CO and/or VOC.**

   The 2 ppmvd @ 15% O_2 on a 24-hour average basis is acceptable for both units, for non-ethane, non-methane VOC. Emission rate calculations, TCEQ Permit Tables, and the PSD Applicability Review Tables have been updated accordingly and are provided in the updated application attached to this letter.

5. **Section 5.2.5 of the application lists different sulfur contents of the fuel for the different turbine options (0.2 grains/100scf for the Siemens equipment compared to 0.4 grains/100scf for the GE equipment). Typically, the fuel content should not vary for the different equipment models because it is the same fuel line. Please provide justification for the different sulfur contents.**

   The calculations have been updated to reflect 0.2 grains/100scf on an annual average basis and 5 grains/100scf on an hourly average basis for both the GE and Siemens options. Section 5.2.5, emission rate calculations, TCEQ Permit Tables and PSD Applicability Review Tables have been updated accordingly and are provided in the updated application attached to this letter.

6. **Section 5.9 discusses BACT for the degreaser. Additional information is required to determine what BACT for this particular unit will entail. Please review the TCEQ's BACT table for degreasers available at the following link and provide a more thorough discussion of how the degreaser will meet the BACT guidelines in the table.**
   http://www.tceq.texas.gov/permitting/air/nav/air_bact_coatsource.html.

   The degreaser that will be used at Lon C. Hill has not been selected; therefore it is difficult to provide any additional details related to this equipment item. However, a degreaser that meets all of the requirements of the Permit by Rule §106.454 will be procured. Therefore, to streamline this application, the degreaser has been removed from the updated application attached to this letter.

7. **Section 5.10 presents BACT for the storage tanks as no controls due to the small capacities and low vapor pressure. The TCEQ's BACT table for tanks is available at the following link and lists BACT as having a fixed roof and a submerged fill-pipe. Please provide a revised BACT discussion for the storage tanks that is consistent with this guidance document.**
http://www.tceq.state.tx.us/permitting/air/nhav/air_bact_chemsource.html

   The storage tanks at Lon C. Hill will be fixed roof tanks with submerged fill-pipes to meet current TCEQ BACT requirements. Section 5.9 (revised section numbering) has been updated accordingly and is provided in the updated application attached to this letter.

Calculations

8. **Please provide turbine methodology to explain how short-term, annual and MSS emissions were determined.**

   a. **According to the turbine calculations, only the GE scenarios included an option for evaporative cooling systems/inlet chillers to be used. For the Siemens turbine scenario, calculations with the option for evaporative cooling system/inlet chillers were not provided. Will evaporative cooling systems/inlet chillers be used if the Siemens turbine is installed? If so, provide all necessary calculations for this scenario.**

      Both GE and Siemens could operate using inlet air cooling to improve their output performance. Inlet air cooling could be achieved either with an evaporative cooling system or with inlet chillers. According to Siemens vendor data, turbine performance and emissions will be the same whether using evaporative cooling or using inlet chillers. Therefore, additional performance data was not provided separately by Siemens.

      GE, however, did provide separate emissions profiles for the different scenarios. We have expanded the calculation references to eliminate the confusion regarding the different scenarios. All operating scenarios are represented for both vendors. Therefore, no new calculations are required.

   b. **Attachment B of the application lists several different "cases" for the turbine calculations; however, several cases are not included. Please provide information about Cases 20-38 (either details about the cases or acknowledgement that they were intentionally not included in the application.**

      Cases 20-38 were requested from Siemens to evaluate power output in the 1x1 configuration scenarios. These cases are, however, identical in terms of fuel consumption, exhaust flow, exhaust composition, and pollutant emission rates to Cases 1 – 19, which is why those cases did not need to be included for air permitting purposes.

c. **The permit application does not provide clear examples of how the turbine emission rates (EPNS STK-101 and STK102) were determined. Provide example calculations and/or an electronic spreadsheet to show how the turbine calculations were determined.**

Detailed example calculations have been developed and are provided in Attachment B of the updated application attached to this letter.

d. **No calculations were provided for the proposed annual emission rates for the turbines. Annual emission rates should be based on a combination of normal operation and MSS emission rates, taking into account how many yours in a year the units are operating in MSS and normal operation mode. Please provide annual calculations for the turbines that represent emissions from both MSS and normal operations.**

Detailed example calculations have been developed and are provided in Attachment B of the updated application attached to this letter.

9. **In Attachment B, pages 24 of 46, footnote 2 references AP-42 Chapter 3.1, Table 3.1-6 as the source for the GT HAP emissions factors. However, the emission factors listed are actually from Table 3.1-3. Since Table 3.1-3 is for natural gas fired turbines, the footnote may be references the wrong table (Table 3.1-6 is for landfill-gas fired turbines). Please verify that the reference is incorrect and provide a new table as necessary.**

The correct reference is Table 3.1-3. GT HAP emission rate calculations have been updated and are included in Attachment B of the updated application attached to this letter.

10. **The calculations for the duct burner HAP emission rates were based on annual operation of 4375 hr/yr. Please confirm that the duct burners will only be operated for 4,375 hr/yr.**

Yes, the duct burners are intended to be operated 4,375 hours per year.

11. **The represented CO emission rates for the auxiliary boiler (EPN ABL STK-100) do not match what is calculated with the listed factor (0.04 lb/MMBtu). In addition, the CO emission factor from AP-42 should be used when calculating the CO emission rates. Provide updated CO emission rates for the auxiliary boiler using the correct emission factor.**

The example calculation for the CO emission factor has been expanded to make the calculation methodology more clear and is included in Attachment B of the updated application attached to this letter. The calculated factor is in fact 0.04 lb/MMBtu, which meets the current BACT for boilers larger than 40 MMBtu/hr of 50 ppmvd @ 3% O_2 limit. (http://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/bact/bact_boilheatfurn.pdf).

The AP-42 factor for a natural gas small (< 100 MMBtu/hr) boiler is 84 lb/MMscf (0.08 lb/MMBtu), according to Table 1.4-1 of AP 42 Chapter 1.4 Natural Gas Combustion (July 1998) . We will be

selecting an Auxiliary Boiler which meets the more stringent BACT requirement of 50 ppmvd @ 3% O_2 (equivalent to 0.04 lb/MMBtu).

12. **For the auxiliary boiler, an annual capacity factor of 0.3 was used. Note, this limits the normal and MSS Operations to a combined total of 2,628 hrs/year. Please correct the normal hours of operations to 2,628 hr/yr minus the MSS hours of operation. Provide the updated calculations and tables.**

    The proposed maximum hours of MSS operations were subtracted from the normal operations to obtain an updated annual emission rate for the Auxiliary Boiler. Emission rate calculations, TCEQ Permit Tables, and the PSD Applicability Review Tables have been updated accordingly and are provided in the updated application attached to this letter.

We appreciate your prompt attention to this permit application and look forward to issuance of the final permit. Please contact me at (281) 333-3339 x201 or via email at mjohnson@camsesparc.com, if you have any questions or need additional information.

Sincerely,

Mona Caesar Johnson, P.E.
CAMS eSPARC, LLC
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Attachment 1: Updated PSD Permit Application

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