

US EPA ARCHIVE DOCUMENT



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6

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DALLAS, TX 75202-2733

DEC 20 2012

Ms. Patricia Outtrim  
Vice President, Government and Regulatory Affairs  
Cheniere Energy–Corpus Christi Liquefaction, LLC  
700 Milam Street, Suite 800  
Houston, TX 77002

RE: Application Completeness Determination for Cheniere Energy–Corpus Christi Liquefaction, LLC  
Greenhouse Gas Prevention of Significant Deterioration Permit  
Corpus Christi Liquefaction

Dear Ms. Outtrim:

The EPA has reviewed your Greenhouse Gas (GHG) Prevention of Significant Deterioration (PSD) permit application for Corpus Christi Liquefaction, LLC which was received by the EPA on September 4, 2012, including supporting documentation. EPA has determined that your application is incomplete at this time. A list of the information needed from you so that the EPA can continue its completeness review is enclosed (see Enclosure). Please notify us if a complete response is not possible by January 14, 2013.

The requested information as stated in the Enclosure is necessary for EPA to develop a Statement of Basis and Rationale for the terms and conditions for the requisite permit. As we develop our preliminary determination, it may be necessary for EPA to request additional clarifying or supporting information. If the supporting information substantially changes the original scope of the permit application, an amendment or new application may be required.

The EPA may not issue a final permit without determining that: 1) there will be no effects on threatened or endangered species or their designated critical habitat, or 2) until it has completed consultation under Section 7(a)(2) of the Endangered Species Act (ESA) (16 USC § 1536). In addition, the EPA must undergo consultation pursuant to Section 106 of the National Historic Preservation Act (NHPA) (16 USC § 470f) and Section 305 of the Magnuson-Stevens Fisheries Conservation and Management Act (16 USC § 1855 (b)(2)). In accordance with the Energy Policy Act of 2005, the Federal Energy Regulatory Commission (FERC) is the lead agency for federal authorization for Cheniere's proposed Corpus Christi LNG and Pipeline Project. FERC is undergoing National Environmental Policy Act (NEPA) review and will prepare an Environmental Impact Statement (EIS) for the project. EPA is a Cooperating Agency to that review and will coordinate with FERC as required. EPA intends to rely on the ESA, NHPA, and Magnuson Stevens Act reviews and consultations conducted as a part of that EIS to fulfill EPA's responsibilities under those statutes for issuance of the GHG PSD permit.

If you have any questions concerning the review of your application, please contact Melanie Magee of my staff at (214) 665-7161 or [magee.melanie@epa.gov](mailto:magee.melanie@epa.gov).

Sincerely yours,



 David F. Garcia  
Acting Director  
Multimedia Planning and  
Permitting Division

**ENCLOSURE**  
**EPA Completeness Comments**  
**Cheniere Energy – Corpus Christi Liquefaction, LLC**  
**Application for Greenhouse Gas Prevention of Significant Deterioration Permit**  
**Corpus Christi Liquefaction**

1. On page 1-1 of the permit application and other locations where the turbine is discussed, it is stated that the LNG terminal will operate three trains continuously (8760 hours per year) using eighteen (18) GE LM2500+G4 SAC (with water injection) gas-fired refrigeration compressor turbines, or equivalent, six on each train. Please explain what is meant by “or equivalent”. Is LNG proposing a different GE LM2500 or different manufacturer and model? If so, please supplement BACT analysis with the additional turbine technical data that is being considered by Cheniere.
2. Being mindful of EPA’s PSD and Title V Permitting Guidance for GHG dated March, 2011 on page 17 which states the following:

“The CAA and corresponding implementing regulations require that a permitting authority conduct a BACT analysis on a case-by-case basis, and the permitting authority must evaluate the amount of emissions reductions that each available emissions-reducing technology or technique would achieve, as well as the energy, environmental, economic and other costs associated with each technology or technique. Based on this assessment, the permitting authority must establish a numeric emissions limitation that reflects the maximum degree of reduction achievable for each pollutant subject to BACT through the application of the selected technology or technique. However, if the permitting authority determines that technical or economic limitations on the application of a measurement methodology would make a numerical emissions standard infeasible for one or more pollutants, it may establish design, equipment, work practices or operational standards to satisfy the BACT requirement.”

In addition to the proposed tons per year emission limit provided in the permit application, please propose output based or efficiency based limits for all GHG emission sources (e.g., lb or ton CO<sub>2</sub>/Bscf natural gas processed or Heat Required (MMBtu)). Please provide an analysis that substantiates any reasons for infeasibility of a numerical emission limitation. For the emission sources where numerical emission limitations are infeasible, please propose an operating work practice standard that can be practically enforceable.

3. Two PSD permit applications for GHG emissions were submitted to the EPA for construction of new units at Cheniere Corpus Christi Liquefaction and Cheniere Corpus Christi Pipeline – Sinton Compressor Station. EPA is seeking supplemental information to assist in understanding your operations, evaluating the source determination for Cheniere’s applications, and developing a comprehensive GHG PSD permit for Cheniere Corpus Christi Liquefaction, LLC. It is also recommended that the information provided be in a form that can be released to the public, in the event we rely upon such information in our source determination. Please provide, at a minimum, the information requested below. However, feel free to provide other information beyond that requested below, if you deem it necessary to describe the stationary source. Please provide a more detailed description of operations at the Cheniere Corpus Christi Liquefaction facility. Where does the natural gas from the Sinton Compressor Station move to next in the natural gas

pipeline? Is the Corpus Christi Liquefaction project solely reliant upon natural gas received from the Sinton Compressor Station? Could the Sinton Compressor Station or Corpus Christi Liquefaction operate without the support of the other facility? Please provide any flow diagrams showing how the two facilities are interconnected and why the two projects should not be aggregated for PSD permitting.

4. Please provide supplemental data to the process flow diagram to identify all pieces of equipment and the emission points that emit or have the potential to emit GHGs with associated emission point numbers (EPN). The process description that was submitted is difficult to follow and understand. The current format combining equipment into one block is difficult to follow. Please provide a process description that separately discusses each unit such as, amine treatment, dehydration system, sulfur removal unit, Boil-up gas (BOG) system, Heavies Removal unit, etc., represented on the process flow diagram and furnish a description of the equipment that is contained in these units and its function. Please segregate the refrigeration train and present it on a separate process drawing with inlet, outlet and recycled process and refrigerant lines identified. It is unclear which units will be part of one train and which units will be common to all the trains. Please supplement your process flow diagram to clearly depict the number of turbines that will be part of one train and the total amount of turbines proposed for this project. On the process flow diagram, please identify the marine flare, the two wet gas flares and the two dry flares and all process equipment streams that are sent to each flare. The process flow diagram indicates a "Unit 34 Hot Oil Dryer Regeneration Gas." Yet the process description does not include a discussion of this unit. Please supplement process description with the details of Unit 34. Are heaters or combustion turbines used to transfer heat to the oil and regeneration gas? Is a waste heat recovery unit utilized in this process? Please identify feeds and products to and from this piece of equipment.
5. Will the proposed storage tanks emit or have the potential to emit GHG emissions i.e., fixed roof Amine Storage tank, internal floating roof storage tank in the Heavies Removal Unit (EPN: IFRTK1), eight Diesel Storage tanks and the Gasoline storage tank? Also, will there be GHG emissions associated with the truck loading operations (EPN: TRKLD)? If so, please supplement the BACT analysis to include these storage tanks.
6. On page 6-1 of the permit application, it is stated that "Because these gas turbines will be used for compression, they will have variable operating characteristics and hotter exhaust temperatures and cannot be compared to turbines used in electric generation." Will there be heat recovery utilization on the gas turbines exhaust? If so, please supplement the process description with the details of this heat recovery and how it will enhance efficiency. What is the proposed monitoring, recordkeeping and compliance strategy to ensure heat transfer efficiency?
7. In the CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O BACT Analysis for the thermal oxidizers in the permit application, it is stated that "the thermal oxidizers will be designed with efficient burners." If "efficient" here refers to energy efficiency or lower relative GHG intensity, please provide comparative benchmark data on the efficiency of proposed burners to existing or similar burners used in thermal oxidizers. Also, it is stated that the control of O<sub>2</sub> will be based on O<sub>2</sub> analyzers to assure high efficiency combustion. Will there be continuous monitoring of CO<sub>2</sub>? Also, it is stated that "design energy efficiency measures" may be included in the proposed thermal oxidizer to increase combustion efficiency. Please clarify if the "design energy efficiency measures" will or will not be included and what will it entail. Please provide comparative benchmark data of these design measures of the proposed thermal oxidizer to similar or existing sources.

8. Beginning on page 9-19 of the permit application, it is stated in the BACT for CO<sub>2</sub>e that the design of the standby generators and the firewater pump engines is so as to maintain optimal energy efficiency. Please provide benchmark data that compares the proposed generator to similar or existing generator in Liquefied Natural Gas (LNG) industry. Please provide supplemental information on how air/fuel ratio controllers and oxygen trim will be utilized to maintain operational efficiency. Please provide supplemental data that details how the proper amount of O<sub>2</sub> will be determined for efficient combustion. Will there be continuous O<sub>2</sub> monitoring? Also, it is stated that the CO<sub>2</sub> BACT for the generators and the fire water pump engine is the use of an efficiently designed and operated generator and fire pump engine with a "low annual capacity factor." Please provide this capacity factor and the rationale that indicates operating this equipment at this capacity factor is energy efficient as BACT.
9. On page 9-21 of the permit application, it is stated "the most stringent control technology, instrumented leak detection and repair (28 VHP), is selected as BACT and further evaluation under Step 4 is not required." The five-step BACT analysis requires the top control such as the TCEQ 28LAER program along with other possibilities of reducing fugitives emissions and leaks to be considered. Was 28LAER considered as the highest control and if so, why was it eliminated?
10. On page 9-30 of the permit application in the N<sub>2</sub>O BACT analysis for turbines, it is stated that very low N<sub>2</sub>O concentrations (<1 ppm) present in the exhaust stream would make installation of a N<sub>2</sub>O catalyst infeasible. In comparison, the application of a catalyst in the nitric acid industry sector has been effective due to the high (1,000 – 2,000 ppm) N<sub>2</sub>O concentration in those exhaust streams. Please provide a reference for this data.
11. In Appendix B of the permit application, please include the carbon factor (lbs of carbon/lb of fuel) for the Tables 4 and 8 that contain the waste material, fuel compositions and waste streams for the thermal oxidizers and all the flares. Also, Appendix A contains Table 8 the waste gas compositions for the dry, wet and marine flare. These streams are labeled as "Waste Gas Stream" but have different compositions. Please provide supplemental information that identifies where each stream is from.