

US EPA ARCHIVE DOCUMENT

Air Liquide Large Industries U.S., L.P.
Bayou Cogeneration Plant
Prevention of Significant Deterioration Permit for Greenhouse Gas Emissions
PSD-TX-612-GHG

Responses to Public Comments

U.S. Environmental Protection Agency
November 21, 2013

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I. Summary of the Formal Public Participation Process

The U.S. Environmental Protection Agency, Region 6 (EPA) proposed to issue a Prevention of Significant Deterioration (PSD) permit to the Air Liquide Bayou Cogeneration Plant on August 29, 2013. EPA announced the public comment period through a public notice published in *The Pasadena Citizen* on August 29, 2013 and on Region 6's website. EPA also notified agencies and municipalities on August 26, 2013 in accordance with 40 CFR Part 124. While the comment period was announced to conclude on September 28, 2013, comments would have been timely if submitted by September 30, 2013, because of 40 CFR 124.20 (Computation of time). On September 30, Air Liquide requested an extension of the comment period to October 14, 2013. This request was granted and a notice of extension was posted to the EPA website on September 30, 2013.

The Administrative Record for the draft permit was made available at EPA Region 6's office. EPA also made the draft permit, Statement of Basis and other supporting documentation available on Region 6's website, and available for viewing at the Harris County Public Library La Porte Branch in La Porte, TX.

EPA's public notice for the draft permit also provided the public with notice of a public hearing. The public notice stated that "Any request for a public hearing must be received by the EPA either by email or mail by September 23, 2013, and must state the nature of the issues proposed to be raised in the hearing...EPA maintains the right to cancel a public hearing if no request for a public hearing is received by September 23, 2013, or the EPA determines that there is not a significant interest. If the public hearing is cancelled, notification of the cancellation will be posted by September 25, 2013 on the EPA's Website <http://yosemite.epa.gov/r6/Apermit.nsf/AirP>. Individuals may also call the EPA at the contact number listed above to determine if the public hearing has been cancelled." During the comment period, EPA did not receive any written requests for a public hearing. EPA posted its announcement that there would not be a hearing on September 25, 2013. EPA received one comment letter from the applicant, Air Liquide, on October 14, 2013.

II. EPA's Response to Public Comments

This section summarizes the public comments received by EPA and provides our responses to the comments. EPA received one comment letter from the applicant.

Analysis of Air Liquide's Comments

During the extended comment period, Air Liquide submitted supplemental information to be added to the administrative record. We have briefly summarized those parts of the submittal that may constitute "significant comments" on the draft permit and provide responses below. 40 CFR 124.17(a)(2).

Comment 1: In considering the cost effectiveness of Carbon Capture and Sequestration (CCS) as a control technology, Air Liquide recommends that EPA rely on a cost per ton analysis, as revised by Air Liquide in its newest submittal. Air Liquide's submittal suggests revised cost/ton figures of \$47/ton and \$42/ton under two studied scenarios. These revised cost studies offered downward revisions from the applicant's earlier cost studies in multiple categories: the interest rate for capital recovery (from 10% to 7%); the retrofit difficulty factor (from 1.5% to 1.1%); the assumed fuel costs (from \$5/MMBtu to \$2.77/MMBtu, which is the annual average of the Henry Hub spot prices for 2012); tax credit offsets that may be available under 26 U.S.C. §45Q(a)(1); revenue potential for sale of captured CO₂ to EOR to offset costs of geologic sequestration (CO₂ used for EOR was not treated as avoided CO₂ emissions).

Response: Our statement of basis (page 13) cited to the Air Liquide application, describing the applicant's initial assessment of costs as follows: *"The capital costs for post-combustion capture and compression is estimated to be \$537,044,041. The capital cost for pipeline to convey the CO₂ is estimated to be \$33,873,469 for a 30 mile long 10 inch diameter pipeline. The annualized cost for CCS and long-term geologic storage is \$99,557,484 which is more than four times the estimated annualized capital cost for the proposed project of \$22,097,090. Based on the normalized control cost and comparison of total capital cost of control to project cost, Air Liquide maintains that CCS is not economically feasible."*¹ We also note that Air Liquide had originally evaluated a CCS scenario with a corresponding estimated cost of \$57/ton of CO₂e controlled, now downward adjusted by as much as 26%. We note, consistent with remarks on page 43 of EPA's PSD and Title V Permitting Guidance for Greenhouse (March 2011) (hereinafter "GHG Guidance") and consistent with cost studies for CCS in other permitting records, the cost effectiveness numbers (in \$/ton) for the control of GHG emissions are significantly lower than the cost effectiveness values for controls of criteria pollutants that have evolved over time. However, based on the volume of GHG emissions compared to non-GHG pollutants from these types of construction projects, the capital construction costs for add-on pollution controls for GHG emissions can quickly exceed a threshold that makes the project not economically viable before consideration of the annual operating costs for such add-on pollution controls for GHGs.

¹ These cited figures were furnished by the applicant in an updated cost estimate dated August 9, 2013.
<http://www.epa.gov/earth1r6/6pd/air/pd-r/ghg/air-liquide-resp080813.pdf>

We appreciate Air Liquide providing these cost/ton figures. Cost information in this form has been provided by applicants and is part of the record in several recently conducted Region 6 permitting actions where CCS has been studied as an available option. However, pending further progression and experience in the permitting of sources of GHGs, we would not agree that our evaluation of economic impacts should be based solely on this cost metric. The NSR Workshop Manual is not (and never has been) a binding regulation that dictates how the economic impacts analysis must be conducted in all cases. See, NSR Workshop Manual, at 1 (October 1990) (first paragraph of Preface); *In re: City of Palmdale (Palmdale Hybrid Power Project)*, PSD Appeal No. 11-07, Slip. Op. 54 n. 39 (EAB Sept. 17, 2012). Consistent with EPA's subsequent permitting guidance for GHGs and the EAB's reasoning in the Palmdale decision that relied upon it, it is not impermissible to rely on a comparison of CCS control costs to overall project costs that clearly shows CCS is cost prohibitive. GHG Permitting Guidance at 42; *City of Palmdale* at 54-55.

Under Air Liquide's revised least-cost scenario, the total annualized capital cost of CCS is \$73,971,932—or now approximately three times the originally estimated annualized cost for the project without CCS. Air Liquide has plainly not urged that these CCS costs, as revised, are economically feasible or that they should change our overall conclusion to eliminate CCS from the BACT analysis, and we do not see a basis to change that conclusion. A typically expected level of accuracy for a BACT decision is ± 20 to 30 percent (GHG Guidance at 39), and the cost changes offered by Air Liquide, assuming them valid, are still in the bounds of the costs as originally reviewed. Thus, we do not see a need in this context to evaluate or discuss the merits of the specific cost changes or calculation methods offered by Air Liquide. Several changes do not appear to be fully justified, making unclear whether the revised estimations are refinements or an inclusion of additional data uncertainty. However, we note some of the cost category changes overlap with concerns expressed by other commenters on CCS cost estimations in other permits. EPA may address those comments in more detail as appropriate in Region 6 responses to comments for other proposed permits that are pending final determinations.

Comment 2: Air Liquide “does not advocate double-counting energy impacts.” The proper place for considering energy impacts is in the cost analysis. There are no unique site-specific constraints on energy that would justify EPA eliminating CCS from consideration in Step 4 of the BACT analysis based solely on energy issues.

Response: Since EPA did not propose to reject CCS for its adverse energy impacts in this instance, the relevance of this comment to this permitting action is not clear. EPA has stated that the costs associated with direct energy impacts should be calculated and included in the economic impacts analysis (see GHG Guidance at 39). However, this does not mean applicants and permitting authorities should not continue to examine whether the energy requirements for each control option result in any significant or unusual energy penalties or benefits. Where such energy impacts are identified, they should be discussed in the record. In this case, the statement of basis referenced an estimated 15% energy penalty if CCS were installed, which is notable, and incidentally, much larger than the parasitic load of add-on equipment used for control of criteria pollutants. However, since energy impacts are not the basis for EPA's elimination of the CCS option in this case, we need not and do not reach a judgment

here as to whether this 15% energy penalty is significant or unusual in the context of this permit or as a general matter.

Comment 3: The addition of CCS would “not create any unusual environmental impacts.” However, adding CCS would increase ozone precursors in an area that is nonattainment for ozone. Air Liquide has accounted for the environmental impact of CCS as a control option by “including the purchase of emission reduction credits...to offset...NO_x and VOC emissions in the economic \$/ton analysis.” EPA should not “solely rely on the increase of NO_x and VOC as an adverse environmental impact that would provide the basis for excluding CCS in this instance.”

Response: We did not propose to “solely rely” on increases in NO_x and VOC to justify the elimination of CCS, and therefore—as in our response to Comment 2—the relevance of this comment is unclear. We agree that adding CCS would increase ozone precursors in an area that is nonattainment for ozone, as was noted in the SOB. Focusing Step 4 on increases in emissions of pollutants other than those the technology was designed to control (i.e., emissions other than CO₂ in the case of CCS) is justified. See GHG Guidance at 39-41; NSR Workshop Manual at B.49. We have flexibility in deciding how to weigh the trade-offs associated with emissions control options. See GHG Guidance at 40. While the environmental impacts of collateral increases in ozone precursors are not by themselves a deciding factor in the rejection of CCS, they are part of our reasoning and appropriately referenced.

Where a potential collateral increase in NO_x and VOC emissions from CCS can be avoided by procuring offsetting emissions reductions, we agree this may minimize or eliminate the adverse environmental impact on ozone concentrations. To the extent the record shows this potential adverse environmental impact can be fully mitigated through purchasing offsets or making other pollution control expenditures, EPA is generally comfortable with including the costs incurred to avoid such an environmental impact in the economic impacts analysis as reflected in the applicant’s revised economic impacts analysis. This approach is similar to addressing the costs of direct energy impacts in the manner discussed in response to Comment 2 above. However, since BACT is a case-by-case analysis, this does not mean that all applicants examining CCS should be expected to procure emissions reductions credits for NO_x and VOCs or that one may only consider these types of emission tradeoffs in the context of the economic impact analysis. If mitigation of these collateral environmental impacts is not effective or feasible, increases in NO_x and VOC emissions from application of CCS may still need to be considered in the context of the environmental impacts analysis in particular areas where ozone concentrations are a concern.

III. Revisions in Final Permit

The following is a list of administrative and clarifying changes for the *Air Liquide Bayou Cogeneration Plant (PSD-TX-612-GHG) Prevention of Significant Deterioration Permit, Final Permit Conditions*.

1. Cover Sheet

The cover sheet titled “Prevention of Significant Deterioration Permit for Greenhouse Gas Emissions Issued Pursuant to the Requirements at 40 CFR §52.21” has been modified to state the following:

In accordance with 40 CFR §124.15(b)(3), this PSD Permit becomes effective 30 days after the service of notice of this final decision unless review is requested on the permit pursuant to 40 CFR §124.19 immediately upon issuance of this final decision.

This administrative change is made as a result of not receiving any comments during the comment period requesting a change in the draft permit or otherwise opposing its issuance.

IV. National Historic Preservation Act (NHPA)

On September 3, 2013, EPA sent a letter to the State Historic Preservation Officer (SHPO) requesting concurrence on EPA findings for Air Liquide's cultural survey. The SHPO sent a letter with concurrence to the EPA on September 30, 2013.