

BEFORE THE ENVIRONMENTAL APPEALS BOARD  
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C.

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In re: )  
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)  
ExxonMobil Chemical Company ) Appeal No. PSD 13-11  
Baytown Olefins Plant )  
)  
PSD Permit No. PSD-TX-102982-GHG )  

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**EPA REGION 6'S RESPONSE TO  
PETITION FOR REVIEW**

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## INTRODUCTION

The EPA Environmental Appeals Board (“EAB” or “Board”) should deny review of the challenges brought by Sierra Club to the Greenhouse Gas (“GHG”) Prevention of Significant Deterioration (“PSD”) permit issued by EPA Region 6 (“the Region” or “Region 6”) on November 25, 2013 to ExxonMobil Chemical Company (“Permittee,” or “Applicant”). The permit authorizes a major modification for GHG emissions at the Baytown Olefins Plant (“Project”). The Region’s PSD permitting decision for the project is fully supported by the record, including a detailed Statement of Basis and Response to Comments document, and satisfies the requirements of the Clean Air Act (“CAA”). Petitioners have failed to demonstrate clear error, an abuse of discretion, or an important policy consideration warranting review of Region 6’s decision.<sup>1</sup>

## FACTUAL AND PROCEDURAL BACKGROUND

On May 3, 2011, EPA published a federal implementation plan that made EPA Region 6 the PSD permitting authority for the pollutant GHGs. *See* 75 Fed. Reg. 25178 (promulgating 40 C.F.R. § 52.2305). On June 7, 2013, Region 6 proposed to issue a GHG PSD permit (“Proposed Permit”) for the proposed construction project and major modification (for GHGs) at the Applicant’s existing olefins plant, which is a major stationary source of criteria pollutants. *See* Sierra Club Ex. 7 at 1.<sup>2</sup> The project, which would be located in the City of Baytown, in Harris County, Texas, would add a new ethylene production unit consisting of eight ethylene cracking furnaces and recovery equipment to produce polymer grade ethylene. *Id.* at 1-4.

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<sup>1</sup> Region 6 has consulted with the Office of Air and Radiation on the preparation of the response brief. OAR supports and agrees with the arguments in this response to the petition for review.

<sup>2</sup> Sierra Club’s attachments are denoted as exhibit numbers, while Region 6’s are denoted by letters. The permit applicant will mark its attachments with a third alternative.

On November 25, 2013, after careful consideration of a 19-page comment letter submitted by Petitioner regarding the Proposed Permit, Region 6 issued a final decision to grant the Applicant a GHG PSD permit for the project at the Baytown Olefins Plant. *See* Ex. 1 (Final Permit). The Final Permit included a number of changes as compared with the Proposed Permit. *See* Ex. 8 at 38-41 (*Revisions in Final Permit*). Along with the Final Permit, Region 6 prepared a 42-page response to comments document, which explained in detail the Region’s reasoning in responding to the comments received, including the basis for any permit changes made and additional analyses conducted by the Region as part of its response. *See generally* Ex. 8.

Petitioner filed its petition for review on December 26, 2013, and an accompanying certificate of service certifies that a copy of the petition was that day arranged to be sent to the Regional Administrator by FedEx. On January 10, 2013, the Region filed a motion for extension of time to file this response, which the Board granted. Consequently, this response from the Region is timely if filed on or before January 23, 2013.

### **STANDING AND STANDARD AND SCOPE OF REVIEW**

When considering a petition for review of a PSD permit, the Board “first considers whether the petitioner has met key threshold pleading requirements such as timeliness, standing, and issue preservation . . . . [I]n order to demonstrate that an issue has been preserved for appeal, a petitioner must show that any issues being appealed were raised with reasonable specificity during the public comment period.” *In re Indeck-Elwood, LLC*, 13 E.A.D. 126, 143 (EAB 2006) (internal citations and footnotes omitted). The burden of establishing that issues have been preserved for review rests squarely with the petitioner. *In re Encogen Cogeneration Facility* (“*Encogen*”), 8 E.A.D. 244, 250 (EAB 1999). A petitioner must not only specify objections to the permit, but also must explain why the permit issuer's previous response to those objections is

clearly erroneous or otherwise warrants review. *E.g., In re City of Palmdale* (“*Palmdale*”), PSD Appeal No. 11-07, slip op. at 10 (EAB Sept. 17, 2012). *See also* Revised Order Governing Petitions for Review of CAA NSR Permits (March 27, 2013) at 4 (“[T]he petitioner must also demonstrate with specific citation to the administrative record where in the response to comments the permit issuer responded to the comments and must explain why the permit issuer’s response to comments is inadequate.”). Alternatively, a petitioner may demonstrate that an issue or argument was not reasonably ascertainable during the public comment period. 40 C.F.R. § 124.13; *see In re Encogen*, 8 E.A.D. at 250 n.8.

If these threshold pleading requirements are met:

The Board's review of a PSD permit is ... discretionary. Ordinarily, the Board will not review a PSD permit unless the permit decision either is based on a clearly erroneous finding of fact or conclusion of law, or involves a matter of policy or exercise of discretion that warrants review . . . [using] an abuse of discretion standard. . . . [T]he Board examines the administrative record prepared in support of the permit to determine whether the permit issuer exercised his or her considered judgment. The permit issuer must articulate with reasonable clarity the reasons supporting its conclusion and the significance of the crucial facts it relied upon when reaching its conclusion. . . . On matters that are fundamentally technical or scientific in nature, the Board will typically defer to a permit issuer’s technical expertise and experience, as long as the permit issuer adequately explains its rationale and supports its reasoning in the administrative record.

*Palmdale*, slip op. at 8-9 (citations, quotation marks, parentheticals, and brackets omitted).

In cases where the permit issuer evaluated and rejected an alternative control option, those favoring the option must show that the evidence ‘for’ the control option clearly outweighs the evidence ‘against’ its application. *In re Pio Pico Energy Center* (“*Pio Pico*”), PSD Appeal Nos. 12-04 through 12-06, slip op. at 48 (EAB Aug. 2, 2013) (citations and quotations marks omitted).

Notwithstanding this well-established and clear standard of review, Petitioner in this case seeks to shift the burden to Region 6 by arguing that a “high bar” applies to the elimination



of a control option on economic grounds when applying the top-down process for determining Best Available Control Technology (“BACT”) and assigning appropriate emission limits to a PSD permit. *See* Pet. at 11-12. The term “high bar” has no basis in precedent of the Board or the phrase “energy, environmental, and economic impacts” in the definition of BACT. 42 U.S.C. § 7479(3); 40 C.F.R. § 52.21(b)(12). Petitioner claims Region 6 must meet this bar to eliminate a control option on the basis of economic impacts in Step 4 of a BACT analysis because the “adverse impact provisions in the top-down BACT analysis are intended only as a safety valve for when impacts unique to the facility make application of the technology inapplicable to that specific facility.” *Id.* Petitioner relies on a 1989 Administrator decision that stated that the “collateral impacts clause” of the BACT definition “operates primarily as a safety valve whenever unusual circumstances specific to a facility” make a less stringent option appropriate. *See* Pet. at 11; *In re Columbia Gulf Transmission Co.*, 2 E.A.D. 824, 827 (Adm’r 1989). However, this precedent has primarily been cited in reference to collateral environmental impacts, not economic impacts. *See, e.g., In re Power Holdings of Illinois*, PSD Appeal No. 09-04, slip op. at 20 (EAB Aug. 13, 2010). Such language does not signify that the elimination of carbon capture and sequestration (“CCS”) on cost grounds should be “unusual” and deserving of added scrutiny on review. Accordingly, Petitioner’s burden shifting argument concerning a “high bar” lacks merit. It is instead, as always, a petitioner’s burden to demonstrate that a permit issuer has made a finding of fact or conclusion of law that is clearly erroneous. 40 C.F.R. § 124.19(a)(4).

### **SUMMARY OF ARGUMENT**

Petitioner fails to make the required demonstration for any of its challenges. Petitioner misses key elements of the Region’s rationale for its permitting decision and inaccurately describes others. In its analysis of BACT for greenhouse gases, Region 6 expressly eliminated

carbon capture and sequestration on the basis of both environmental and economic impacts and also identified questions about the technical feasibility of a CCS system at this facility. In its analysis of economic impacts, the Region in fact considered the cost-effectiveness of a CCS system in this case.

The EPA's historic approach of focusing on cost-effectiveness when assessing economic impacts in a BACT analysis is not required by law. Region 6 has the discretion to use alternative approaches and provided rational reasons for using the approach that it did in this case. In the absence of cost-effectiveness range that prior PSD permit applicants have been required to pay, it was reasonable for Region 6 to compare the cost of a control option to the total project costs. Use of this approach is consistent with prior PSD permitting decisions and one decision of the EAB which concluded the approach was not "impermissible."

The record here is sufficiently detailed to support Region 6's conclusions. EPA has recognized in guidance that it may be appropriate in some cases to assess the cost of CCS in a less detailed manner and that CCS is an expensive technology. EPA has called for greater detail in circumstances where prior PSD permit applicants have applied the control under the BACT requirement, which thereby creates a presumption that cost and other impacts that have been borne by one source of a given source category may be borne by another source of the same category. This is not such a case, since no applicant has been required to pay costs for GHG control on the order of the costs estimated for the ExxonMobil facility at issue here.

Petitioner does not demonstrate that the costs of CCS in this case are within the range of costs that other permit applicants have been required to pay to control greenhouse gas emissions. The increase in project costs Region 6 relied on in this case is on the same order as the cost

increase for CCS that Region 6 found prohibitive in other permitting decisions for olefins facilities.

This case does not present any policy issue that the Board needs to review. The approach of comparing control costs to total project costs applied in this case, and used by several other EPA Regional Offices, is a manifestation of a coordinated and evolving policy development process involving EPA Regional Offices and the Office of Air and Radiation. These offices are actively considering the policy issues raised by Petitioner concerning the most appropriate and consistent way to evaluate the economic impacts of GHG controls, including carbon capture and sequestration. Accordingly, the Board should deny review.

**I. PETITIONER OVERLOOKS AND MISREPRESENTS KEY ELEMENTS OF REGION 6'S BASIS FOR NOT SELECTING CCS AS BACT FOR GHGS**

Petitioner oversimplifies the issue of CCS as it appears in the administrative record. As indicated by the many pages of additional analysis on CCS provided by the Region in the Response to Comments, the option was thoroughly studied. *See* Ex. 8 at 10-26.

Petitioner asserts that Region 6 eliminated CCS “solely on the basis of a comparison to total project costs,” *see* Pet. at 22, an assertion flawed for several reasons, not least of which that Region 6 relied on both environmental and economic impacts to justify eliminating CCS at Step 4 of its top-down BACT analysis. In response to Sierra Club’s comment, Region 6 explained that it had “noted the case-specific environmental impacts of operating a CCS system.” Ex. 8 at 15. The Region then said that “[t]hese other impacts, coupled with the costs of CCS, have led to the elimination of the CCS technology....” *Id.* In footnote 17 on page 29 of its petition, Sierra Club describes how Region 6 considered “energy impacts and secondary environmental impacts” and asserts that “the Region explicitly did not base its rejection of CCS on those secondary

impacts.” The quotation above shows that, in fact, the Region explicitly did so. To support this mistaken claim in footnote 17, Petitioner cites to the Region’s statement on page 25 of the Response to Comments document that “energy impacts are not the basis for the EPA’s elimination of the CCS option in this case.” Ex. 8 at 25. But Petitioner ignores the rest of the comment response. Continuing on to the next page, the Region observed that the facility was located in an ozone nonattainment area. The Region explained that implementation of CCS at the facility would result in as much as an 11 percent increase in ozone precursor emissions and “potentially exacerbate ozone formation in the area.” *Id.* at 26. The Region then concluded that “[a]lthough this factor, by itself, is not decisive, nonetheless it supports the decision that there are adverse cost and environmental implications of requiring a BACT limit based on use of CCS, such that EPA is not requiring that level of control.” *Id.*

Furthermore, the Petition argues that “[t]he CCS analysis must consider the cost-effectiveness of CCS.” *See* Pet. at 10. Yet Region 6 did exactly that. On the same page of the Response to Comment document that is quoted several times by the Petitioners, Region 6 observed that “ExxonMobil calculated a cost effectiveness of ‘over \$253/ton CO<sub>2</sub>e’ and we generally agree with their analysis.” *See* Ex. 8 at 15. Then, two sentences later, Region 6 said that “other impacts, coupled with the costs of CCS, have led to the elimination of the CCS technology.” *Id.* Petitioner nowhere acknowledges this discussion of a case-specific, cost-effectiveness calculation in its petition for review. On page 39 of the petition, there is a passing reference to a cost effectiveness calculation of \$245.7 per ton, but no recognition of the fact that Region 6 explicitly described and thus “considered” a cost-effectiveness value of roughly the same magnitude.

Petitioner claims that “[t]he Region admits that it did not consider cost-effectiveness in its BACT analysis,” but supports this only with the Region’s statement that “it is not necessary to further assess the cost-effectiveness of those disproportionately costly controls.” Pet. at 12; Ex. 8 at 15.<sup>3</sup> Neither the plain meaning nor the context of the quoted statement supports Petitioner’s charge. Petitioner does not demonstrate how the phrase “further assess” equates to “did not consider,” particularly when the paragraph immediately preceding the quoted statement includes a discussion of a “calculated cost effectiveness of ‘over \$253/ton CO<sub>2</sub>e.’” Ex. 8 at 15.

Later, Petitioner correctly notes that the Region “rejected the premise of Sierra Club’s comment that cost-effectiveness must form the basis of its determination to reject CCS as economically infeasible.” But rejecting this premise that Region 6 “must” base its determination on cost-effectiveness does not equate to failing to in fact consider cost effectiveness. The record clearly shows that Region 6 did consider the cost-effectiveness of CCS. As evidenced by both Petitioner’s own comments and the Region’s response, the estimated average cost effectiveness value for CCS at a 90% control rate was transparently available for comment, part of the record, and something considered before Region 6 eliminated CCS as a control option. *See* Ex. 2 at 7 (quoting the estimated value of \$253.30); *See* Ex. 8 at 12 and 15 (quoting the same value while responding to comments on costs).<sup>4</sup>

Petitioner also fails to accurately present the response provided by the Region to the comment arguing that the permit decision must use the OAQPS Control Cost Manual (“Cost Manual”) to study and develop project specific cost estimations for CCS. It is not the case that

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<sup>3</sup> The petition actually cites page 14 of the Response to Comments document, instead of page 15 where the quoted statement appears.

<sup>4</sup> True, the statement of basis did not provide the estimated average cost effectiveness figure for the studied CCS option, but Petitioner can cite no requirement that this be done. Far from there being a “complete lack of cost effectiveness data,” such data was plainly in the administrative record for the Draft Permit. 40 C.F.R. § 124.9.

the Region “rejected the Control Cost manual completely” or that there was a “wholesale rejection of the Control Cost Manual.” The Region’s response was more nuanced, leaving open that it may be acceptable to study CCS costs via application of the Cost Manual’s methodology, even as it is not required or, in the Region’s judgment, consistent with known cost studies for CCS. *See* Ex. 8 at 19-20.

In the permitting record, the applicant provided information not only on economic infeasibility, but had also asserted in its own BACT analysis that CCS is not available, not applicable, and thus not technically feasible. *See* Ex. 4 at 19-25. While an applicant may consider elimination of CCS to be appropriate earlier in the analysis, a permit issuer may, as here, decide to eliminate CCS under a Step 4 cost analysis based on the “assumption” that CCS has passed Step 2. *See In re City of Palmdale (“Palmdale”),* PSD Appeal No. 11-07, slip op. at 53 (EAB Sept. 17, 2012). Even as the Region considered CCS past Step 2 of its BACT analysis, the Region did not discount that “there are some portions of CCS that may be technically infeasible for this project.” *See* Ex. 7 at 9, n. 2. The Region had also not overlooked the technical challenges of CCS in responding to comments on costs. *See, e.g.,* Ex. 8 at 15, 20, 22.

Because Petitioner does not confront the rationale provided by the Region, Petitioner does not meet the requirements for a petition and cannot capably demonstrate clear error. *See* 40 CFR § 124.19 (a)(4)(ii).

## **II. PETITIONER’S PREFERRED METHODOLOGY FOR ASSESSING THE ECONOMIC IMPACTS OF THE CCS CONTROL OPTION WAS NOT REQUIRED, AND REGION 6 SUPPLIED RATIONAL REASONS FOR USING AN ALTERNATIVE APPROACH**

The heart of Petitioner’s argument in this case is that Region 6 was required to follow (practically to the letter) the precise analytical methodology described in the EPA’s NSR Workshop Manual (“NSR Manual”) and Control Cost Manual. This is plainly invalid on its

face, as these documents are not binding regulations that Region 6 must follow. *See, e.g. General Electric v. EPA*, 290 F. 3d 377, 381-85 (D.C. Cir. 2002); *Appalachian Power v. EPA*, 208 F. 3d 1015, 1020-23 (D.C. Cir. 2000). Petitioner admits as much with respect to the NSR Manual on page 35 of its petition, but nevertheless asserts repeatedly throughout other portions of its petition that a cost-effectiveness analysis is “required” or a “requirement” and that certain techniques described in the Cost Manual are also required.

Based principally on the NSR Workshop Manual and no specific statutory or regulatory language, Petitioner contends Region 6 was bound to evaluate CCS costs based on an average cost-effectiveness (dollars per ton) calculation. In addition to being based on an EPA guidance document that clearly does not have the force of law, Sierra Club’s premise has no basis in the statutory text of the Clean Air Act or EPA regulations. The Petition cites no language in statute or regulation that defines how the EPA must assess economic impacts in the context of a BACT analysis. The statutory command that BACT result in “the maximum degree of reduction of each pollutant subject to regulation ... taking into account .... economic impacts and other costs” plainly does not mandate any particular type of cost analysis. 42 U.S.C. § 7479(3). Petitioner cites to no court decision that holds otherwise. Moreover, the D.C. Circuit has repeatedly held that similar provisions in the Act afford the EPA great discretion as to how costs are to be considered and balanced against the other enumerated statutory factors, and that no particular type of cost analysis is mandated. *See, e.g. Husqvarna AB v. EPA*, 254 F. 3d 195, 200 (D.C. Cir. 2001) (CAA section 213(a)(3)’s requirement that standards to control emissions from non-road engines shall achieve the greatest degree of emission reduction achievable through the application of available technology “giving appropriate consideration to cost” “does not mandate a specific method of cost analysis”); *National Ass’n of Clean Water Agencies v. EPA*, 734 F. 3d

1115, 1156-57 (D.C. Cir. 2013) (CAA section 112(d)(2) requirement that standards to control emissions of hazardous air pollutants shall achieve the “maximum degree of reduction in emissions .... The Administrator determines is achievable” “taking into consideration the cost of achieving such emission reduction” does not mandate a specific method of cost analysis); *Sierra Club v. EPA*, 325 F. 3d 374, 378 (D.C. Cir. 2003) (technology-forcing requirement in CAA section 202(1)(2) that standards to control emissions of toxic air pollution emissions from motor vehicles to “the greatest degree of emission reduction achievable through the application of technology which will be available ...taking into consideration ... costs of the technology” does not resolve how the EPA should balance the various statutory factors and does not “constrai(n) the consideration of cost”).

In a context very similar to this case, the EAB has previously recognized that the “economic impacts” analysis required in the BACT provisions does not mandate use of the cost-effectiveness approach that permit issuers have typically applied based on EPA guidance. *Palmdale*, Slip Op. at 54 n. 39 (“This general approach is based on EPA guidance, see NSR Manual at B.31, and is not mandated by statute or regulation, see generally 42 U.S.C. § 7479(3) (BACT definition); 40 C.F.R. § 52.21(b)(12) (same).”). The Board then concluded the Region’s approach in that case of comparing the costs of CCS to the costs of the entire project “was neither inappropriate nor impermissible.” *Id.* at 55. The latter term suggests no legal prohibition against the approach of comparing control costs to total project costs.

The Board’s *Palmdale* opinion considered more specific and recent EPA guidance on the economic impacts analysis for GHGs reflected in the EPA’s *PSD and Title V Permitting Guidance for Greenhouse Gases* (March 2011)(“GHG Guidance”). This contrasts notably with the Petitioners comments on the Draft Permit and petition for review in this case, which scarcely



acknowledge the evolution in the EPA's thinking on the economic impacts analysis reflected in this document. As noted by the Board in *Palmdale*, the GHG guidance observes that "it may be appropriate in some cases to assess the cost effectiveness of a control option in a less detailed quantitative (or even qualitative) manner" and that decisions regarding economic evaluations should be explained in a well-documented permitting record. *Palmdale* at 55; GHG Guidance at 42. In addition, the GHG guidance also observes that "there is not a wealth of cost effectiveness data from prior permitting actions for a permitting authority to review and rely upon when determining what cost level is considered acceptable for GHGs." GHG Guidance at 43. (This remains the case today, less than two years later). The Region's Statement of Basis specifically identified the GHG Guidance as being assistive and pertinent to the Region's approach in issuing the GHG PSD permit. *See, e.g.*, Ex. 7 at 4 and 6. In addition, although the EPA acknowledges that the NSR Workshop Manual favors the study of dollars per ton cost effectiveness for determining BACT costs, the fact that the NSR Manual was prepared more than 20 years before the advent of GHG permitting under the Clean Air Act (and thus focused more on criteria pollutants that were at that time already subject to up to 13 years of PSD permitting actions), signifies that the GHG-specific guidance that the EPA issued in 2011 is the more relevant resource on PSD and BACT matters pertaining to GHGs.

The Petitioner has likewise failed to demonstrate the Region 6 was required to follow the Cost Manual. For the first time in its appeal, Petitioner has cited the requirement for adherence to the Cost Manual in the regional haze program, specifically as used to develop cost estimations for Best Available Retrofit Technology (BART) determinations. However, the BART Guidelines are not guidance but in fact a regulation binding on select, large electric generating units (40 C.F.R. Part 51, Appendix Y). In contrast, Petitioner points to no regulation requiring

that CCS costs be developed and studied under the Cost Manual methodology. Petitioner cites B.33 of the NSR Workshop Manual as “specifically direct[ing] that the Cost Manual be followed.” Even if a non-binding guidance could have such an effect, this is a gross exaggeration of what the referenced page of the NSR Workshop Manual says. The discussion on this page of the NSR Workshop Manual clearly supports Region 6’s description of the Cost Manual as a “recommended and utilized resource in the development of cost projections made for the control of criteria pollutants.” *See* Ex. 8 at 19.

Given the lack of specific constraints in the statutory requirement to consider “economic impacts” or regulations controlling how this analysis is conducted, the Agency clearly has the discretion to determine the most appropriate way to evaluate economic impacts. It is correct, of course, that both the EPA and state permitting agencies have chosen to use cost-effectiveness as a metric for consideration of costs in many BACT determinations involving emissions of criteria pollutants. There are sound policy reasons that support this longstanding approach, some of which Petitioner articulates. Indeed, the EPA continues to prefer and recommend that BACT analyses focus on cost-effectiveness and that permitting authorities use the Cost Manual as a resource. However, that does not mean that EPA Regional Offices are forever bound to employ only a cost-effectiveness approach and the techniques in the Cost Manual, and they are precluded from using alternative approaches (alone or in combination with historical approaches) to eliminate a control option based on economic impacts when there are rational reasons to use that alternative approach and they are articulated in the record supporting the decision.

**A. Region 6 Had A Rational Basis for Using An Alternative Approach To The Economic Analysis That Is Fully Consistent with the EPA’s GHG Guidance and Prior Practice in Other Permits**

As articulated clearly in the record in this instance, the EPA and state permitting officials are at the very inception of implementing BACT for a pollutant that is new, not just to BACT control, but to control under any part of the Clean Air Act: the six well-mixed greenhouse gases which the EPA found to endanger public health and welfare and which have only recently become a “pollutant subject to regulation” for purposes of the PSD program. *Coalition for Responsible Regulation v. EPA*, 684 F. 3d 102, 132-136 (D.C. Cir. 2012), *cert. granted in part sub nom., Utility Air Regulatory Group v. EPA*, 134 U.S. 418 (2013). As the earlier quoted statement from the GHG Guidance makes clear, there is little past permitting experience to draw on to find a cost of greenhouse gas control for stationary sources that might or might not be cost effective. Moreover, the EPA has not yet reached any conclusion on that issue in a national rulemaking, such as a New Source Performance Standard. Thus, permitting authorities are currently lacking a key benchmark that the EPA’s guidance recommends they use to determine whether a control technique is cost-effective – “the cost of control for the pollutant in recent BACT determinations.” NSR Manual at B.45; *See also, In re: Masonite Corporation (“Masonite”)*, PSD Appeal No. 94-1, 5 E.A.D. 551, 563-66 (EAB Nov. 1, 1994) (a cost-effectiveness figure should be “compared with what other companies in the same industry have been required to pay in recent BACT determinations to remove a ton of the same pollutant”).

The Region’s response to Petitioner’s comment that the comparison of control cost to total project cost (a percentage increase in capital costs) was invalid, zeroed right in on the critical issue described above. The Region quoted the EPA’s statement in the GHG guidance about the paucity of cost-effectiveness data available for comparison. Ex. 8 at 14. Region 6 then cited *Palmdale* to explain and illustrate that the commenter was incorrect in asserting that the EPA was precluded from using the cost comparison approach. *See id.* The Region made no

claim to justifying its particular findings as to CCS in the case of the Baytown Olefins Plant by comparing the Applicant's project facts to those at issue in *Palmdale*, but rather cited *Palmdale* only for the proposition that the EAB had concluded the approach was consistent with the EPA's GHG permitting guidance and was not "impermissible." Implicitly, the Region's reference to the *Palmdale* decision also shows consistency with the approach used in previous GHG BACT determinations. The petition argues that a cost effectiveness analysis must be used to ensure consistency in the BACT analysis for GHGs, but does not demonstrate that following the cost approach used in prior PSD permits in the absence of a cost-effectiveness benchmark from other permits is inconsistent with the goal of consistent comparison across permits. Indeed, by listing a significant number of permits that have applied the same approach to assessing economic impacts that the Region used on the Baytown Olefins Plant permit, the Petitioner demonstrates consistency between this permit and others issued by the EPA.

**B. Petitioner Has Not Preserved Review or Carried its Burden on the Argument that Comparing CCS Costs to Total Project Costs is Arbitrary or Misleading**

For the first time in its appeal, Petitioner presents a new argument that the approach of comparing CCS costs to total project costs is "completely arbitrary because it depends entirely on the cost of the underlying project rather than the amount of pollution the facility generates." *See Pet.* at 18. This argument has not been preserved for review because it was not presented in Petitioner's comment letter.

In any event, Petitioner's arguments do not demonstrate clear error. Petitioner cites the observation in the NSR Manual at B.45 that capital costs of a control presented by itself or as a percentage of project costs "may appear excessive" and "can be misleading." As is plain from the fuller context of this statement, the concern against misleading presentations of costs applies where the permit issuer is otherwise advantaged with knowledge of the "normal range of

acceptable BACT costs” and “what constitutes low or reasonable cost effectiveness numbers” for the particular pollutant at issue. *Id.* at B.45-46. As discussed above, such information is not presently available for the CCS control option. Petitioner says that the comparison of CCS control costs to total project costs can make CCS appear disproportionately more expensive for a “relatively cheaper project.” However, the project at hand is relatively large in terms of expense, on the order of a Greenfield project. As a large eight furnace addition, it is not a project “with relatively modest underlying costs.”

**C. Region 6 Provided a Rational Basis for Not Applying the Recommendations of the Control Cost Manual, and Petitioner Demonstrates No Clear Error in Region 6’s Rationale**

Region 6 clearly explained that the OAQPS Control Cost Manual states that “new and emerging technologies are not generally in the scope of the Manual” and that “the control devices included in the Manual are generally well established devices with a long track record of performance.” Ex. 8 at 19. In addition, the Region’s response noted that the Cost Manual, in its current edition, did not anticipate the considerations that apply to GHG permitting, and explained that costs of CCS may be more sensitive to location and other unique factors than conventional controls. Furthermore, the Region conscientiously considered the value of consistency in the approach that it used. In response to comments, Region 6 explained that many permit applicants had utilized the best available information on the costs of CCS technology provided by the Department of Energy rather than relying on the Cost Manual, which does not contemplate cost development for CCS. Thus, the Region said applying the Cost Manual would be inconsistent with prior permit applications. The Region also explained:

[A]ny BACT determination finding CCS to be cost effective under one costing methodology makes it important for subsequent cost studies prepared by other permit applicants to provide data and calculations sufficient to make comparisons and take proper account of relevant differences in costing approach.

Ex. 8 at 19. Accordingly, if a BACT determination requiring CCS were to be based on cost estimations developed under Control Cost Manual methodology, the Region has indicated that subsequent cost studies should account for relevant differences in costing approach.

In the meantime, the Region is not barred from supporting the Applicant's cost estimations, or any other cost estimations, when they utilize the "the best available information on costs for CCS technology." *See id.* This information would include the cost studies from the Department of Energy that were referenced in the Region's response to comment. *See* Ex. 8 at 19.<sup>5</sup> This would also include the economic study of CCS that was developed to support the agency's September 20, 2013 proposal for New Source Performance Standards for carbon pollution from new power plants.<sup>6</sup> For all this literature, Petitioner cannot point to instances of adherence to the Cost Manual. Moreover, as stated in the Region's response, Petitioner did not point to any permitting case where CCS costs were strictly developed under the methodology of the Cost Manual.<sup>7</sup>

Petitioner has therefore asked that costs of CCS be studied in a way that differs from most existing cost studies for the technology, but unjustifiably labels anything other than its approach as being "non-standard." *See* Pet. at 38. It would appear that Petitioner is less interested in consistency than in shifting to a methodology that it could argue makes for a "trend of decreasing price estimates for CCS." *See* Pet. at 24. Following the Cost Manual is still recommended for cost estimations for conventional criteria pollutants and for the conventional add-on controls covered by the Manual. In those cases, a methodologically narrower

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<sup>5</sup> Notably, EPA was a co-chair contributor with the Department of Energy on the *Report of the Interagency Task Force on Carbon Capture*. *See* Ex. A at 7.

<sup>6</sup> The proposal was published on January 8, 2014 (79 Fed Reg. 1429), but the regulatory impact analysis for the proposal was cited in the Region's Response to Comments. *See* Ex. 8 at 16, n. 17.

<sup>7</sup> In making this observation the Region does not mean to indicate that it would necessarily oppose or reject such an effort.

examination of costs is justified by established practice and the fact that the costs of conventional pollution control equipment will generally be integral to the cost of doing business. Since this is not yet the case for CCS, the Region can appropriately examine all expenses that would apply to the use of the technology, even those cost categories that Petitioner would like to exclude so as to portray the costs to be lower.<sup>8</sup>

Petitioner opposes CCS cost estimations founded on the Levelized Cost of Energy; however, as was repeatedly noted in the record, CCS is particularly energy intensive. Therefore the energy costs of CCS over the life of the system are more prominent than such costs would be for conventional add-on controls. Petitioner has not demonstrated that it is unreasonable to take account of these added costs. In addition, Petitioner has not demonstrated why it would be reasonable to apply the “overnight cost method” to a project having a major pipeline component, a construction endeavor that substantially differs from the on-site construction contemplated in the Cost Manual. Petitioner’s “overnight cost method”— a descriptive term for Cost Manual methodology, not found in the Cost Manual itself — would mandate that certain expenses be excluded from the cost estimation, not because they would not be incurred, but because a methodologically narrow examination of costs would impose consistency across BACT determinations. However, CCS is recognized to be an expensive technology at present, and nothing bars the Region from considering Petitioner’s “adders” (e.g., inflation, escalation, owner’s costs, etc.) as valid expenses and basing its judgment on a more holistic study of the economic impacts of CCS. Excluding any real costs from consideration, when at this time no costs of CCS have been borne by a similarly-situated source via the BACT requirement, may justifiably be seen as arbitrary from the Applicant’s perspective.

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<sup>8</sup>Moreover, Petitioner argued for reductions in the cost estimation for CCS through study of tax credits and subsidies even when that would conflict with references in the Control Cost Manual.

In the Response to Comments, the Region noted that the use of a capital charge rate in the estimate of the annualized capital cost for CCS appeared to be consistent with the NSR Manual. *See* Ex. 8 at 20. The rate appeared to include fixed annual costs, plant overhead, taxes, insurance, and capital recovery charges. *See id.* The Region examined the information provided by the Applicant and reasonably found the rates and information cited to be comparable to the rates and information provided in previous GHG PSD permitting applications where EPA Region 6 issued a final permit. *See id.*; *see also* Ex. B at 1.

Petitioner fails to demonstrate clear error in the Region's acceptance of the annualized capital costs used in the economic impact analysis. Region 6 provided a rational explanation in response to comments that amply justified the capital cost rate used in this case with emphasis on the assumed case-specific rate that applies based on "uncertainty in return on a major venture" for a first of its kind project. *See* Ex. 8 at 20. While the commenter claimed the capital recovery factor to be "excessive," the Region examined the assumptions used in other cost studies and did not find support for the claim. *Id.*

Petitioner incorrectly claims that the region is "required" to follow the Cost Manual and use a capital recovery factor based on the "social rate of interest," which it marks at 00.8%. *See* Pet. at 38. Even assuming the Cost Manual were to be utilized, the Petitioner vastly overstates its prescriptiveness and misconstrues its terms. *See* Ex. 10 at 2-13 (explaining that the manual "facilitates the application of a customized interest rate," when appropriate). While the NSR Manual states that estimates for control costs can be established by using a reference source like the Control Cost Manual, *see generally* NSR Manual at B-33, B-35, and Appendix B, the NSR Manual does not suggest that the Cost Manual is to be used as a substitute to information provided by equipment vendors and/or permit applicants. *See* NSR Appendix B, at b.3, b.6. Yet



Petitioner argues that cost information submitted by the applicant should be ignored, instead substituting reliance on “social rate of interest” and “social interest rate,” terms that are not even found in the NSR Manual or the GHG Guidance.

The Applicant sufficiently justified the capital recovery factor used in its cost estimates with reference to treasury rates as qualified by the investment risk for its approximations of CCS costs, which--in striking contrast to Petitioner’s proffered number--is well in the realm of capital recovery factors cited by the Cost Manual. *See* Ex. 10 at 2-43 (“Table A.2”). When Petitioner repeats its hand calculated capital recovery factor of 0.0543, it presents a number so miniscule that the authors of the Cost Manual literally never envisioned the possibility of such a number applying to an air pollution control project. *See id.* (showing a lowest capital recovery factor of 0.07455 when applying 5.5% interest over 25 years). Ironically, for a case where Petitioner has bandied a charge of “book cooking,” Petitioner’s capital recovery factor shortchanges the costs of CCS by hundreds of millions of dollars in this case, using an interest rate that is essentially an order of magnitude smaller than interest rates used in the economic studies of CCS known to the Region, including those provided by other GHG PSD permit applicants.

**III. THE RECORD CONTAINS SUFFICIENTLY DETAILED INFORMATION ON THE COSTS OF CCS TO SUPPORT THE CONCLUSION THAT ITS COSTS WERE DISPROPORTIONATELY HIGH IN THIS CASE**

Petitioner cannot sustain its assertions that “the record does not contain sufficient data to support the Region’s conclusion that CCS is economically infeasible” and that the Region’s method of economic impact analysis does not “reflect the level of detail necessary in a BACT analysis.” *Pet.* at 28. While the record may be “less detailed” because the Applicant provided its data from the “ExxonMobil Research and Engineering Team” in a report form, *see Pet.* at 32,

the Region was fully able to explain its decisions in a well-documented permitting record. *See* GHG Guidance at 42.

The Applicant submitted an initial application in May 2012 that provided generic cost estimations for application of CCS at the project. *See* Ex. 3 at 4-5 to 4-8. Even as the Applicant later provided upward adjustments to these estimations based on further site-specific study of costs, the Applicant had then stated the cost per ton of CO<sub>2</sub> controlled and the annual costs for CCS control of 90% of CO<sub>2</sub> emissions “was extraordinarily high and would render the project economically unviable if selected.” *See* Ex. 3 at 4-7. Little more than a month later, the Region asked the Applicant for further “site-specific facility data to eliminate CCS from consideration.” *See* Ex. C. Among its other requests for details, the Region specifically requested an updated “cost per pound of CO<sub>2</sub> removed.” *See id.* The Applicant worked to provide responsive details in its October 2012 submittal of supplemental information. *See* Ex. 4. While Petitioner apparently objects to the “narrative” format of the response, a review of its content shows that the Applicant was responsive to all parts of the Region’s request for more information on CCS costs. With benefit of this additional study of CCS costs, the Applicant cited the newly re-estimated average cost effectiveness and annualized costs, again concluding that costs were “extraordinarily high” and “would render the proposed project economically unviable if selected.” *See* Ex. 4 at 23 and 25. These representations from the Applicant (i.e., that the Project would not be economically viable if CCS were to be required) are made more credible, or are at least difficult to refute, when no similar source has undertaken a CCS project.

On receipt of comments for the Proposed Permit, the record shows that the Region had several meetings with the Applicant at which it was emphasized that supplemental cost details may be assistive in evaluating or responding to comments. *See, e.g.,* Ex. D. The Applicant

provided additional cost information that proved helpful to the Region's responses. *See* Ex. B; see Ex. 8 at 20; 40 C.F.R. § 124.17(b)(EPA may document its response "by adding new materials to the administrative record"). Petitioner does not acknowledge this and other cost data provided in the administrative record, even as it proves baseless Petitioner's claim that "Exxon's cost calculations for CCS lack any meaningful detail." *See* Pet. at 29 and 30 ("complete lack of detail") and 14 ("complete lack of cost-effectiveness data").

**A. Petitioner Does Not Demonstrate Clear Error in Alleging that Design Details for CCS Were Lacking Because the Relevant and Essential Details Were Provided and Are Unchallenged**

Petitioner cannot demonstrate clear error based on the alleged lack of design details, because the Applicant provided the control system design parameters. Petitioner has approvingly cited the 90% assumed control rates for CCS and does not quarrel with the applicant's assumption of a 20-year equipment life. *See* Pet. at 3 and 38. Petitioner's asserted basis for clear error is based on its impression that it is "simply incorrect" for the Region to have stated that the record "clearly reflected the design basis and equipment that would be needed to install a CCS system." *See* Pet. 31. Petitioner may wish to see the design details in a different format or in greater depth, but it cannot credibly claim that design details are not site-specific or are completely lacking.

Petitioner's reference to the NSR Manual on the importance of control system design parameters states the parameters are needed "before costs can be estimated." *See* NSR Manual at B.32. "The most important item is to ensure that the design parameters used in costing are consistent with emissions estimates used in other portions of the PSD application." *Id.* In this case, the design parameters correspond to the project's specified emissions levels, and the specified design for 90% capture does "appear reasonable" and indeed has not been challenged.

*Id.* While the equipment and basis for equipment cost estimates can undoubtedly be broken down and documented more thoroughly than provided in Exhibit 4, this mere fact does not implicate “inadequate documentation.” If CCS had been applied to similar sources, additional documentation would be particularly important to avoid confusion in the comparison of costs, but this consideration is not present here. *See* NSR Manual at B.32.

**B. Petitioner Does Not Demonstrate Clear Error in Region 6’s Decision Not to Refine its CCS Cost Analysis to Include Two Separate CCS Systems on Separate CO<sub>2</sub> Streams**

Petitioner fails to demonstrate clear error in the Region’s consideration of a CCS system design that grouped the major emissions streams for control by a single CCS system rather than providing a more detailed analysis of the costs for separate CCS systems on separate CO<sub>2</sub> streams. In this case, the Region reasonably responded to Petitioner’s comments concerning the waste stream from the additional utility plant that would be needed for purposes of the CCS system under study in the BACT analysis. *See* Ex. 8 at 23. Petitioner’s allegation, proved baseless by the Region’s response, was that the costs of capturing emissions from the additional utility plant were being used to inflate the costs of the CCS system. The comment asserted that the waste stream from that utility plant would have a lower CO<sub>2</sub> concentration and would thus raise the overall costs of capturing CO<sub>2</sub> at the plant. *See* Ex. 12. That the Petitioner repeats the comment in the petition shows a misreading of the record, because the comment’s underlying premise—then and now—is not applicable to the CCS system studied in the BACT analysis. Accordingly, there can be no demonstration of clear error on this issue.

Petitioner claims that the “record does not contain data on CO<sub>2</sub> content” of the waste streams, *see* Pet. at 41, n. 24, but this not correct. The very document cited by Petitioner explains that the furnace exhausts “contains less than eight (8) vol% CO<sub>2</sub> in the stack gas.” *See*

Ex. 4 at 21. This is data “on CO<sub>2</sub> content” in the form of an upper bounded estimation.<sup>9</sup> More significantly, Petitioner fails to appreciate the fact that costs were not based on the assumption of a lower concentration stream coming from the utility plant, thus leaving no basis for the charge of inflated costs. *See* Pet. at 44. The record explains that the CCS system was designed (i.e., specified in costs) to remove furnace section exhaust at the rate of 92 tons of CO<sub>2</sub> per 1,350 tons of total furnace exhaust. *See* Ex. 4 at 22. This calculates to removal of 6.8% of the exhaust stream by weight. The record also explained that the system was designed to remove 26 tons of CO<sub>2</sub> per 380 tons of utility plant exhaust, which calculates to an identical removal of 6.8% of the exhaust stream by weight. *Id.* Since the applicant had explained that the system under study had assumed a “~90% recovery of CO<sub>2</sub> from the exhaust gas,” these rates, as should be expected, correlate to a consistently estimated CO<sub>2</sub> concentration of 8% (for cost study purposes) on a mass basis prior to application of CCS. An alternate part of the record estimates that, in application, the furnace exhaust streams would in fact have a lower CO<sub>2</sub> concentration than that coming from the utility plant (assumed to be a natural gas boiler at 10-11% by volume). *See* Ex. 8 at 14-15. If this is so, following Petitioner’s argument, the CCS system design is made *more* reasonable by including utility plant emissions in the combined waste streams being captured by a CCS system. Accordingly, the charge made in the comment is thoroughly contradicted by the record. The Region responded appropriately in its note that the “CCS cost study had not based its costs on a lower concentration stream coming from the utility plant.” *See* Ex. 8 at 23, n. 23. Because these facts govern, Petitioner’s challenge regarding the utility plant waste stream is not based on any “facially plausible” demonstration that costs were overestimated and there accordingly exists no clear error. *Cf. In re Steel Dynamics, Inc.*, 9 E.A.D. 165, 199 (2000). .

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<sup>9</sup> Another portion of the record, not directly cited by Petitioner but pointed to in the Region’s response, explains that the cost analysis was based on a volume concentration of 4.7% CO<sub>2</sub> (which differs from the concentration assumed on a mass basis). *See* Ex. E at 5.

In this context, the Petitioner’s request for a more detailed analysis including additional CCS options was rightly deemed to be unreasonable and unnecessary. Because the CCS system requires a utility plant,<sup>10</sup> the studied CCS system contemplates an additional energy-intensive emissions unit. This additional unit should be seen as additionally subject to the BACT requirement or, as the Region explained, treated as part of the “overall economic or cost consideration for BACT.” *See* Ex. 8 at 23. “Doing otherwise, would not fully account for the prospective economic, energy, and environmental impacts of applying CCS as a control option for this project.” *See id.* Petitioner claims the Region’s response constituted a failure to respond to significant comments, *see* Pet. at 44, but this is not so. The comment simply did not justify the asserted need for additional analysis.

In Petitioner’s view, the record should include the designs and costs for at least two additional system designs. *See* Pet. at 42. However, Petitioner did not show that the CCS system under evaluation was unreasonable and that this additional analysis would be helpful or would produce any different conclusions. In contrast, the Applicant stated that separate CCS systems would be less cost effective because those systems would not be advantaged with the same economies of scale as the system under study. *See* Ex. E at 5; *see also* Ex. 4 at 22 (“Amine regeneration and CO<sub>2</sub> compression would be centrally located...”). Petitioner’s comments provided no basis for the Region to think the contemplated CCS system design was unreasonable for this project or that a demand for additional designs would be material to the Region’s overall conclusions, and the Region was therefore justified in not preparing more detailed analyses of the costs of multiple, additional system designs. Even as the commenter’s request for additional analysis was considered to be unreasonable and unreasonably burdensome in this case, the

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<sup>10</sup> This is a fact that Petitioner “disputes,” *see* Pet. at 42, but has not validly made a basis for challenge. The Region reasonably responded to Petitioner’s comments disputing the need for the utility plant in the CCS system design. *See* Ex. 8 at 22-23. Petitioner has not challenged that response in its petition.

Region's response was not intended to suggest that a study of different CCS system designs (or levels of control efficiency) may be inappropriate or unhelpful in other cases. In this case, however, the grouping of emissions units including the sizeable utility boiler was appropriate, and Petitioner has not credibly demonstrated otherwise. Deference to the Region's "technical expertise" as the permit issuer is warranted, and the Board should deny review on this issue. *See Palmdale*, slip op. at 9.

**C. Petitioner Does Not Establish that a Higher Level of Detail is Required**

The Region appropriately considered the GHG Guidance on evaluating the economic impacts of CCS. The first sentence in this document specifically addressing the evaluation of economic impacts of GHG control strategies says that "it may be appropriate in some cases to assess the cost effectiveness of a control option in a less detailed quantitative (or even qualitative manner)." GHG Guidance at 42. The EPA has recognized that at present CCS is an expensive technology. *See* GHG Guidance at 42. Additionally, the Board has acknowledged how current guidance recognizes that the costs of CCS would likely lead to elimination as BACT either in step 2 or 4. *See Palmdale*, slip op. at 55, n. 40 (*citing* GHG Permitting Guidance at 42-43; "...we expect that CCS will often be eliminated from consideration in Step 4 of the BACT analysis...").<sup>11</sup> In light of these observations, to the extent any party in this case faces a "high bar" with respect to CCS in the BACT analysis, it is the Petitioner because the EPA's precedents lead toward the conclusion that CCS is rather costly at this time and recognize that it is not always necessary to conduct a detailed quantitative analysis to conclude that the costs are excessive for a specific source. On reviewing cost data provided by the Applicant that confirmed

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<sup>11</sup> There is a presumption that the costs and other impacts borne by one source of a given source category may be borne by another source of the same source category. Under such a factual setting, which does not apply to the Baytown Olefins Plant, a demonstration of "unusual circumstances" would be needed to overcome the presumption that controls are cost effective. *See* NSR Manual at B.29.

this conclusion, it was not necessary for the Region to require vendor quotes and fuller designs for a control option that would make the project unviable. While the Region may have the discretion to demand that level of documentation when it is warranted, here, in the context of the available information and the EPA's prior analysis of the costs of CCS, such a request would have unreasonably burdened the Applicant.

Petitioner does not show that EAB precedent dictates an additional level of detail to justify eliminating CCS as a control option. In responding to comments, the Region explained that "detailed and comprehensive project cost data" is not necessary for every BACT determination. *See* Ex. 8 at 21. The Region's authority for this proposition was a Board decision that explained how a permit issuer need not demand "very detailed and comprehensive project cost data" in every case. *See In re: Masonite Corporation ("Masonite")*, PSD Appeal No. 94-1, 5 E.A.D. 551, 566 (EAB Nov. 1, 1994). While in the *Masonite* case, the Board determined that additional details were needed, this determination was not based on requiring details for details sake. Instead, the permit issuer had ignored the "typical cost effectiveness range" for VOCs, which the applicant had presented "as a yardstick for cost-effectiveness determinations in its permit application." *See Masonite* at 563-566. Moreover, the permit issuer's own contractor had preliminarily concluded that the rejected control option was cost effective, but the permit issuer had not conducted a final cost effectiveness analysis to see whether the calculations would be "within the acceptable range." *See id.* at 564. Thus, the remand for additional details was to a specific end, namely for the production of additional and final cost data to be "compared with what other companies in the same industry have been required to pay in recent BACT determinations to remove a ton of the same pollutant." *Id.* Such a need for additional cost



details does not apply to the present case because no PSD permit applicants have been required to install CCS under the BACT requirement.

The Board decisions cited by Petitioner are similarly not favorable to Petitioner on a fair examination of their finer details. Petitioner cites *In re Gen. Motors, Inc.*, 10 E.A.D. 360 (EAB 2002), where the permit issuer improperly rejected controls with average costs within the range deemed acceptable by the permit issuer in the past by giving excessive weight to incremental costs in the BACT determination.<sup>12</sup> Citing its *Masonite* decision, the Board again explained that a permitting authority “need not perform a detailed, comprehensive calculation of cost-effectiveness” when the cost of employing add-on controls is obviously excessive. *Id.* at 374-375, n 12. However, as with the *Masonite* case, the Board decided to remand the permit for additional cost data because the permit issuer had not resolved conflicting information in the permitting record. Specifically, the Board observed that average cost effectiveness figures for the project in that record “appear[ed] to fall within the range of costs found *acceptable* by the [by the permit issuer] *in other BACT determinations.*” *Id.* (emphasis added). Again, these factual circumstances do not transfer to the instant case, which is not a “range of cost effectiveness” case, nor one where the Region failed to fully and reasonably address all claims that the estimated costs of CCS had been inflated. Thus, Petitioner has not justified its demands for additional detail beyond that provided in the thorough, reasoned responses provided by the Region.<sup>13</sup>

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<sup>12</sup> OGC and the Office of Regional Counsel for Region 5 submitted an amicus brief to support the petitioner’s arguments in the case. *In re Gen. Motors, Inc.*, 10 E.A.D. at 369.

<sup>13</sup> Petitioner has additionally cited *In re Steel Dynamics, Inc.*, 9 E.A.D. 165 (2000). In that case, the Board found there was no information in the administrative record on SCR costs at other steel mills or other facilities and the Permittee produced a cost-effectiveness estimate “that was five-to-ten times higher than any of five recent reheat furnace/SCR estimates calculated for other steel mills.” *Id.* at 205. In this case, the Region compared the Applicant’s to CCS cost estimations for a superficially similar project and found that the Commenter had not supported its allegation of inflated costs, a finding left unchallenged by Petitioner. *See* Ex. 8 at 21, n. 21.

Furthermore, the record here reflects a more detailed study of the design considerations and economic impacts of CCS than what was provided in the generic estimations from reference sources upheld by the Board in *Palmdale*. See Ex. F at 38. Moreover, to the extent Petitioner supports the outcome in *Palmdale*, we note that Region 9’s estimations—taken in part from the *Report of the Interagency Task Force Carbon Capture and Storage* (August 2010)—had not adhered to the costing methodology that Petitioner has made a basis for this permit challenge.<sup>14</sup>

Board precedent allows that a permit issuer should “have a reasonably accurate idea of what the cost-effectiveness of a control option is” See *Masonite* at 566; see also *Sierra Club v. EPA*, 167 F.3d 658 (D.C. Cir. 1999) (“EPA typically has wide latitude in determining the extent of data-gathering necessary to solve a problem. We generally defer to an agency’s decision to proceed on the basis of imperfect scientific information, rather than to ‘invest the resources to conduct the perfect study.’”). In this case, the Region had a reasonably accurate idea of the costs of CCS, and Petitioner has not demonstrated otherwise. See Ex. at 22 (reciting how cost estimates even for non-GHG BACT determinations “are typically accurate to within  $\pm$  20 to 30 percent”) What may constitute a “reasonably” accurate idea of the costs of CCS is individual to each permitting record. Here, there exists: (1) no prior BACT determination requiring CCS for a facility such as the Baytown Olefins Plant; (2) no NSPS yet relevant to the study of CCS cost effectiveness at the Baytown Olefins Plant; (3) no established or applicable “range of cost effectiveness” that the Applicant or Region, or even the Petitioner, has stated would be cost effective for the project. Assuming, however, a BACT determination were known to require CCS for a similar source, even only an arguably similar source, the Region would not dispute (and in fact stated in this case) that the cost data underlying that determination would be relevant to the

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<sup>14</sup> The methodology in fact appears to have included all the costs that Petitioner argues to be inappropriate on pages 36-37 of its petition. See Ex. A at A-14 through A-19.

Region's judgment regarding the amount of detail as well as the methods of cost estimation needed analyze CCS as part of its BACT analysis. *See* Ex. 8 at 19.

**IV. PETITIONER DOES NOT DEMONSTRATE UNDER ANY METRIC OR METHODOLOGY THAT THE COSTS OF APPLYING CCS AT THIS FACILITY ARE IN THE RANGE THAT OTHER SOURCES HAVE BEEN REQUIRED TO PAY**

The Petitioner has not met its burden to show that the evidence for the CCS control option clearly outweighs the evidence against its application. *Pio Pico*, slip op. at 48. With respect to economic impacts, Petitioner asserts that Region 6 used an invalid methodology and failed to support its conclusion that costs were prohibitive using that methodology, but Petitioner fails to provide any evidence that CCS is in fact cost effective in this instance or that the increase in capital costs is not disproportionately high. Petitioner has given no evidence that is contrary to the Region's finding of economic infeasibility, i.e., no evidence to demonstrate that CCS is cost effective or otherwise economically achievable in this case.<sup>15</sup>

Petitioner criticizes Region 6 for relying on a three-sentence email from the Applicant, Pet. At 26, but Petitioner has provided no evidence that gives Region 6 or the EAB cause to question the statement in the email that a capital cost increase in excess of 25% threatens the viability of the expansion of the Baytown Olefins facility at issue here. When there is nothing in the record that contradicts the fact asserted, Region 6 cannot be faulted for erroneously finding as fact the statement in the applicant's email, even with some equivocation in the statement.

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<sup>15</sup>Importantly, when Petitioner claims that permits would "show a trend of decreasing price estimates" for CCS when costs are "done properly," see Pet. at 24, Petitioner is not claiming that costs of the technology are dropping from engineering and operating experience with the technology. Instead, Petitioner implies that ExxonMobil has been able to "cook the books" to make CCS "appear[] economically infeasible." *See* Pet. at 41. However, the Region can well discern differences in accounting methods. Petitioner's arguments would be well-taken in a case where an applicant had used creative accounting to avoid comparison to a case where CCS were required, but that is not this case.

As mentioned above, the touchstone of the cost-effectiveness approach in the NSR Workshop Manual is evaluating whether “the cost of reducing emissions with the top control alternative ... is on the same order as the cost previously borne by other sources of the same type in applying that control alternative.” NSR Manual at B.44. The EPA has supported eliminating an option based on cost by showing that “the cost to the applicant of the control alternative is significantly beyond the range of recent costs normally associated with BACT for the type of facility (or BACT control costs in general) for the pollutant.” NSR Manual at B.45.

Petitioner has provided no evidence of costs previously borne by other sources applying CCS, nor for that matter documented any cost of control for GHGs that applicants have been required to bear in recent BACT determinations (whether for CCS or another control alternative for GHGs). Region 6 considered the \$253 per ton estimate provided by the Applicant and found it credible. But Petitioner provides no information to show that any source has been required to pay \$253 per ton for CCS or any other GHG control technique. Nor is there any evidence that a permit applicant has been required to bear costs for GHG controls at the lower dollars per ton levels calculated by using Petitioner’s methodology.

Likewise, Petitioner has not shown that any permit applicant (or any source in any other regulatory context) has been required to bear a capital cost increase in the range of 25% to apply CCS or another GHG control technique. The chart on pages 15-17 of the Petition describes costs that applicants have *not* been required to bear in recent BACT determinations, but there is no evidence in the Petition of any BACT determination for GHGs that have required costs of control in the range of the costs estimates reflected in the record here.<sup>16</sup>

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<sup>16</sup> The only barometer that Petitioner even suggests to demonstrate overall cost-effectiveness is in reference to the social cost of carbon as it compared to an unrelated project. Pet. at 23. However, the Region disagreed that the concept applied to the economic impacts analysis in a BACT determination, and the Petitioner has not challenged the Region’s response. Ex. 8 at 16-17.

Petitioner completely overlooks and fails to confront Region 6's observation that "EPA has eliminated CCS on economic and other step 4 grounds in all of its recent PSD permit BACT determinations for ethylene production units (e.g. BASF/Fina; Chevron Phillips Cedar Bayou, Equistar La Porte; Equistar Olefins 1&2; INEOS Olefins & Polymers)." Petitioner omits three of these 5 permits from its chart on pages 15-16 of its petition. That Petitioner omits all mention of the Chevron Phillips Cedar Bayou permitting action is especially telling. The Region had specifically cited this project for being "superficially similar" in scale to the Applicant's project, *see* Ex. 8 at 21, n. 21, and yet Petitioner sees unfit to mention that the Region had concluded in that case: "The addition of CCS would increase the total capital project costs by more than 25%. That cost exceeds the threshold that would make the project economically viable." *See* Ex. G at 12. Thus, the 25% cost increase calculated for the Applicant is unquestionably within the range at which Region 6 has eliminated CCS in a recent, prior BACT determination. Petitioner's reference to estimated CCS cost increases for the Equistar Chemicals La Porte permit at 25-50% only reinforces this point.<sup>17</sup> Of course, even where Region 6 has eliminated CCS at higher costs, it does not show that a 25% increase in project costs is within the range that any permit applicant has been required to pay.

Petitioner has not demonstrated error from arguments regarding the *Palmdale* decision. In the *Palmdale* case, as quoted by the Board, Region 9 had stated, "...the estimated annual cost for CCS is about \$78 million, or more than twice the value of the facility's annual capital costs." *Palmdale* at 53. However, in the case of ExxonMobil, the Region has relied on the applicant's representation that "the addition of CCS is expected to increase the total capital project costs by more than 25%." *See* Ex. 5. Accordingly, the record support in this case speaks to an

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<sup>17</sup> While Petitioner only cites the Applicant's earlier lower bounded estimation of 25%, the Applicant later refined this estimation to state that CCS "would increase the capital cost of the project by at least 27% and maybe as high as 41%." *See* Ex. B at 1.

anticipated increase in total capital project costs. However, Region 9 in its Palmdale decision had compared the annualized capital *and* operating costs of CCS to the annualized capital costs of the project. They are two different comparisons (and, of course, for two different facility types). Petitioner's claim that the relative impact to project costs is "25% compared to 200%," see Pet. at 21, is not correct because Region 9's inclusion of operating costs for CCS in the comparison necessarily presents a higher number.

Since CCS has not been required in any PSD permit or any other regulatory context, even if the Board were to find aspects of Region 6's analysis that would benefit from further support, remanding would serve no purpose because the Petitioner would still not be able to show that any cost estimate (no matter how low) is within the range that other applicants have been required to pay. The Petition itself expresses uncertainty about whether further analysis will produce a meaningful result: "Upon remand...the Region may ultimately determine that CCS is economically infeasible for the Baytown facility...." See Pet. at 27, n. 16. This refrain is repeated in other places in the petition. See Pet. at 28 (...[I]t is possible...that the Region may ultimately reject CCS as economically infeasible for this project...). Merely speculating that "further analysis," see Pet. at 45, might lead to a different result (and yet, "possibl[y]" not) falls short of accepting and meeting a petitioner's "burden of demonstrating that review is warranted." See *In re Sierra Pacific Industries*, PSD Appeals Nos. 13-01 to 13-04, slip op. at 21 (EAB Jul. 18, 2013); see also *Palmdale* at 52, n. 37 ("Speculative suggestions fall short of establishing clear error or abuse of discretion on appeal.")

A petition need not identify a specific contested permit condition; it may also identify some "other specific challenge to the permit decision." 40 C.F.R. 124.19(a)(4). Here, however, the petition does not challenge the permit as whole or insist that its conditions must be otherwise

so much as it insists that “the BACT analysis is flawed” for want of the details and analysis that Petitioner thinks to be necessary, for policy reasons, in this and other permitting records. *See* Pet. at 45. In this respect, much of Petitioner’s arguments take on the contours of a request for an advisory opinion on the level of detail needed to support the elimination of CCS from a BACT analysis as general matter.

Petitioner suggests its call for further analysis without demonstrating it would be meaningful is somehow fitting with a reference to the case disposition emphasized in *Alaska Dep’t of Env’tl. Conservation v. EPA*, (“ADEC”), 540 U.S. 461 (2004). *See* Pet. at 27, n. 16. In that case, the EPA issued a stop-construction order using its supervisory authority over the reasonableness of a state permitting authority’s BACT determination. In upholding the EPA’s actions in the case, the Court left open that the state could revisit its BACT determination on “an appropriate record.” *See ADEC*, 540 U.S. at 501. This point of emphasis was consistent with the position the EPA had taken in the administrative record and throughout the litigation brought by the state permit issuer. The EPA was not acting in that case as a stakeholder commenter; its position was based on the agency’s significant, but limited oversight role, which recognizes the “the need to accord appropriate deference” to a State’s BACT determination and disclaims any intention to “‘econd guess’ state decisions.” *See ADEC* at 490. Petitioner does not have the authorities or responsibilities at issue *ADEC*, and the case is inapposite on that basis.

More importantly, Petitioner is not limited against “favoring”—within the meaning of *Pio Pico* and predecessor cases articulating the petitioner’s burden—the application of a particular control technology for this or any project (as opposed to merely favoring a “more detailed” study of the something that may nevertheless be eliminated). In fact, it presents an interesting contrast that Petitioner did so, in express terms, with respect to a control option other

than CCS in this very case by stating: “The Region must revise the draft permit to require flare gas recovery.” Ex. 2 at 17.<sup>18</sup> Petitioner cannot demonstrate error based on its demands for greater details when Petitioner fails to show those details would or should materially change the permit decision.

In dealing with another petition, the Board recently concluded, “While the Region provided a detailed explanation as to why the technology should be rejected, Sierra Club has only provided generalized statements supporting its use.” *See Pio Pico*, slip op. at 67. The same organizational Petitioner provides even less than that in this case. In fairness, Petitioner is unequivocal in its support of additional study and consideration of CCS. However, this does not demonstrate clear error in the BACT determination for the Baytown Olefins Plant.

#### **V. PETITIONER DOES NOT DEMONSTRATE THE NEED FOR THE BOARD TO EXERCISE ITS DISCRETION TO REVIEW AN IMPORTANT POLICY CONSIDERATION**

Because the means for examining whether CCS is BACT for GHGs is an important issue, the EPA’s Office of Air and Radiation (“OAR”) is actively engaged in working with Regional Offices in developing an appropriate approach for determining whether CCS is economically achievable and should be required as BACT in any permitting decision. As discussed above, in the absence of prior permitting decisions or other regulatory actions that can be used to identify an acceptable cost range for CCS, the EPA offices have necessarily needed to develop alternatives to the standard methods the EPA has previously used to assess whether a control technology is economically achievable. At the time the NSR Workshop Manual was issued in 1990, there had been over a decade of experience with PSD permitting for most pollutants regulated at that time. With this much permitting experience to draw from, the EPA and states

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<sup>18</sup> In a change from the plans in the original application and the terms of the Proposed Permit, the Final Permit now includes limits that reflect the use of a flare gas recovery system.



did not face the challenge now faced with the evaluation of CCS as a control option without an established range of cost-effectiveness for one or all types of sources. Because it does not care for the outcome of the collective process among OAR and the Regional Offices for addressing this challenge, Sierra Club urges the Board to intervene and direct Region 6 and other EPA offices to cease using an interim approach for GHGs that has proven workable in many permitting decisions. For the reasons discussed below, this case is not the proper forum to determine EPA policy on this subject.

In its presentation to the Board of grievances against an approach that Region 6 and multiple other EPA Regions have all applied in examining BACT for GHGs, one thing that the Petitioner successfully demonstrates is that the Agency has made a considered policy judgment to apply the capital cost increase approach to CCS at the present time. In at least two places, the Petition for Review complains in bold faced and underlined text that Region 6 has applied the total cost comparison approach in “every” GHG BACT analysis it has issued since greenhouse gases become subject to regulation in 2011. Pet. at 13-14. The Petitioner then expresses concern that Region 4 has followed that approach and used the same reasoning. *Id.* at 17. The *Palmdale* case of course shows that Region 9 has been applying a similar approach. However, this is not simply a coincidence or a case of the Regions operating independently. This is the manifestation of a coordinated and evolving policy development process involving the Regional Offices and OAR.

Petitioners have presented some thoughtful observations about the limitations of the capital cost increase approach that OAR and the Regions should and will consider in assessing the workability of this approach on an ongoing basis. The influence of the overall size of the project on the percentage of increase that is calculated merits scrutiny, but the Petitioner does not

demonstrate that permitting authorities are incapable of taking that limitation into account or adjusting for it when making comparisons across permits. Furthermore, Petitioner has not demonstrated that consistency with prior BACT determinations for traditional pollutants is preferable at this time to consistency with the approaches that have been developed and applied in many other greenhouse gas permitting decisions. OAR and the Regions recognize that permit issuers have gained some experience in PSD permitting for GHGs at this stage (including some additional data on cost effectiveness), but this experience is still limited and does not dispel the observation of the GHG Guidance that there is “limited data and consequent uncertainty concerning the costs of GHG BACT.” *See* GHG Guidance at 43. At present, the EPA is also carefully examining the costs of CCS for electric generating units in the context of proposed New Source Performance Standards. 79 Fed. Reg. 1429 (Jan. 8, 2014) (proposed rule). OAR and the Regions are actively evaluating whether there is sufficient information available to move toward relying more heavily on a traditional dollars per ton calculation for CCS. That Region 6 concluded otherwise in this case does not demonstrate the need for EAB review, especially where Petitioner’s comments did not raise all of these policy considerations and provide Region 6 with an opportunity to respond.

Petitioner does not demonstrate a widespread misreading of the Board’s decision in the *Palmdale* matter. As discussed earlier, Region 6 cited the decision only to demonstrate that the Board did not find the capital cost increase approach to be impermissible as a general matter or find that the cost-effectiveness approach is required in each case. Other EPA permitting decisions are referencing it for the same reason. The implication the Petitioner draws of the Board’s alleged intention to limit the permissibility of the capital cost increase approach to extreme and exceptional cases is not expressed anywhere in the opinion itself. The Board

should certainly evaluate whether the Region provided an adequate justification for applying that approach in this case, while also looking at several other factors and considering the cost effectiveness of CCS at the same time. Since the record shows no error in that explanation, the Board should not grant review based on Petitioner's request to alter an otherwise clear opinion that stands only for what it says and has been read by Regional offices to mean nothing more or less.

Petitioner had commented that, because the BACT requirement is technology forcing, "there has to be a first instance" that a permit writer determines a technology like CCS is economically achievable. In their role as permit issuers, the EPA Regions are not restrained from determining that CCS is BACT, making it past step 4 in any individual permitting case when the record supports such a decision. But this is not such a case. For the reasons outlined above, Petitioner has demonstrated no clear error with the permitting decision before the Board. Indeed, the policy that the Petitioner asks the Board to overrule is not the exclusive basis for Region 6's decision to eliminate CCS.

In its effort to enlist the Board's help in overturning the product of the policy development process described above, Petitioner makes assertions and allegations regarding other PSD permitting actions that are well beyond the scope of review in this case. In this appeal of an individual permit, it is not relevant whether Region 6 "has issued numerous draft and final GHG PSD permits that are based on faulty and incomplete BACT analyses." Pet. at 3. The Region is charged to base its final permit decisions on a specified administrative record, and the Board's review is likewise based on a specified administrative record. 40 CFR §§124.18-124.19; *see In Re Kendall New Century Development*, 11 E.A.D. 40, 55 (EAB 2003) (rejecting consideration of outside-the-record testimony for "a differing proceeding," and observing that

“requiring a petitioner to raise issues in the permit proceeding where the petitioner wants those issues to be considered...places a minimal burden on the petitioner and provides a manageable record....”). Petitioner, however, has not restrained itself from straying beyond these limitations. *See* Pet. at 15, n. 7 and 24 (arguing that departing from the administrative record is proper for purposes of showing a “trend”). Petitioner has stated “the Region is still struggling with the implementation of effective permitting limits,” *see* Pet. at 2, and that this permit is “just one example of a permitting decision that falls short of the Clean Air Act requirement to establish appropriate GHG emission limits.” *Id.* at 3. Petitioner has asserted the Baytown Olefins Plant permit “exemplifie[s] the Region’s inadequate implementation of the PSD permitting program in general for GHGs.” At times, it appears that Petitioner even seeks for the Board to rebuke the Region for more than the specified errors in the petition. *See* Pet. at 28.

This is to a large extent *post hoc* criticism that Region 6 was not given an opportunity to address in individual permitting decisions. Sierra Club has submitted comments on only five of the 19 permitting records named by Petitioner. Furthermore, Petitioner has not even accurately characterized those actions after the fact. In all 19 cases a “cost per ton” figure for the control of CO<sub>2</sub> with CCS was provided by the applicant.<sup>19</sup> Petitioner is thus wrong in stating that a cost per ton figure can only be located “in some instances” (*see* Pet. at 15, n. 6), or from a “handful of permit applicants” (*see* Pet. at 17).

Petitioner is similarly wrong in implying that the Region’s determinations are made with a “complete lack of cost effectiveness data.” *See* Pet. at 14. The Statement of Basis language used for every permit proceeding explains that EPA’s conclusions rely upon “information provided by the applicant” and that each proposed GHG BACT determination is based on “the

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<sup>19</sup> Permitting record information is presently posted for public benefit on the Region’s website. *See* Air Permits, <http://yosemite.epa.gov/r6/Apermit.nsf/AirP> (last accessed January 5, 2014).

information contained in the Administrative record.” *See, e.g.*, Ex. 7 at 1 and 31. In many cases, as with the instant case under review, the SOB had additionally stated that the Region has reviewed the applicant’s BACT analysis, incorporated it into the Statement of Basis, “and also provides its own analysis in setting forth BACT for this proposed permit, as summarized below.” See Ex. 7 at 8. Petitioner cannot demonstrate that the Region did not study, consider, and invite comment on costs presented under a “\$/ton” metric in *this* case, much less in all other permit proceedings conducted by the Region.

Petitioner apparently considers these broader accusations about “inadequate implementation” of the PSD permitting program to provide a stronger case for Board review, but a petition argued in this manner disregards the proper scope of review. Under such circumstances, discretionary review of the petition’s allegations would be similarly improper.

## CONCLUSION

For the reasons stated above, Region 6 respectfully requests that the Board deny review of Region 6's Final GHG Permit for the ExxonMobil Chemical Company Baytown Olefins Plant.

Date: January 23, 2014

Respectfully submitted,

*/S/ Brian Tomasovic*

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**STATEMENT OF COMPLIANCE WITH WORD COUNT LIMITATION**

I hereby certify that this Response to Petition for Review submitted by EPA Region 6, exclusive of the Table of Contents, Table of Authorities, Table of Attachments, this Statement of Compliance, and the attached Certificate of Service, contains 13,621 words, as calculated using Microsoft Word word-processing software.

*/S/ Brian Tomasovic*

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Brian Tomasovic

## TABLE OF ATTACHMENTS

	Title	Full documents last accessed, Jan. 23, 2014, and available at:
<b>A</b>	<i>Report of the Interagency Task Force on Carbon Capture and Storage</i> (August 2010) (excerpts)	<a href="http://www.epa.gov/climatechange/Downloads/ccs/CCS-Task-Force-Report-2010.pdf">http://www.epa.gov/climatechange/Downloads/ccs/CCS-Task-Force-Report-2010.pdf</a>
<b>B</b>	Email from ExxonMobil (Benjamin Hurst) to EPA (Jeff Robinson) providing additional information in an email attachment (9/20/2013) (excerpt)	<a href="http://www.epa.gov/earth1r6/6pd/air/pd-r/ghg/exxonmobil-baytown-response092013.pdf">http://www.epa.gov/earth1r6/6pd/air/pd-r/ghg/exxonmobil-baytown-response092013.pdf</a>
<b>C</b>	Letter from EPA (Carl Edlund) to ExxonMobil (Jeffrey Kovacs) with determination of application incompleteness (6/29/2013)	
<b>D</b>	Memo of Meeting with ExxonMobil Representatives on August 29, 2013.  *Erroneously marked as “August 28, 2013” on Index*	
<b>E</b>	Email from ExxonMobil (Benjamin Hurst) to EPA (Aimee Wilson) providing additional information in an email attachment (9/6/2013)	
<b>F</b>	EPA Region 9, <i>Responses to Public Comments on the Proposed Prevention of Significant Deterioration Permit for the Palmdale Hybrid Power Project</i> (October 2011) (excerpts)	<a href="http://www.epa.gov/region9/air/permit/palmdale/palmdale-response-comments-10-2011.pdf">http://www.epa.gov/region9/air/permit/palmdale/palmdale-response-comments-10-2011.pdf</a>
<b>G</b>	EPA Region 6, <i>Statement of Basis, Draft Greenhouse Gas Prevention of Significant Deterioration Preconstruction Permit for the Chevron Phillips Chemical Company, Cedar Bayou Plant</i> (October 2012) (excerpts)  *Erroneously (or non-conventionally) bearing a watermark that states “DRAFT”*	<a href="http://www.epa.gov/earth1r6/6pd/air/pd-r/ghg/chevron-sob-oct2012.pdf">http://www.epa.gov/earth1r6/6pd/air/pd-r/ghg/chevron-sob-oct2012.pdf</a>



## CERTIFICATE OF SERVICE

I hereby certify that I caused a copy of **EPA REGION 6'S RESPONSE TO PETITION FOR REVIEW** in the matter of ExxonMobil Chemical Company Baytown Olefins Plant, EAB Appeal No. PSD 13-11. Pursuant to 40 C.F.R. § 124.19(i)(3), the parties reached an agreement to accept service by electronic means.

Dated: January 23, 2013

*/S/ Brian Tomasovic*

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