

**BEFORE THE ENVIRONMENTAL APPEAL BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

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

**INTERVENOR EXXONMOBIL CHEMICAL COMPANY'S RESPONSE TO THE
PETITION FOR REVIEW**

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INTRODUCTION

The U.S. Environmental Protection Agency, Region VI (the “Region”) issued a Clean Air Act Prevention of Significant Deterioration (“PSD”) permit for greenhouse gas (“GHG”) emissions, No. PSD-TX-102982-GHG (“Permit”), to ExxonMobil Chemical Company (“ExxonMobil”) on November 25, 2013. Administrative Record (“A.R.”) at V.01. The Permit imposes best available control technology (“BACT”) emission limits on GHG emissions from a new state-of-the-art ethylene production unit at ExxonMobil’s Baytown Olefins Plant in Baytown, Texas. *Id.* Sierra Club does not take issue with any permitted emissions limitation but instead asks the Board to remand the permit because the Region allegedly did not properly analyze the cost of one alternative—carbon capture and sequestration (“CCS”) technology—during the BACT determination. As described below, the Region’s permit decision to reject CCS as BACT for the proposed ethylene production unit is fully supported by the extensive record addressing the economic costs that would render the proposed project economically infeasible if CCS were required. The record also recognizes that CCS has never been implemented at any ethylene production unit anywhere in the world. In the absence of any statutory, regulatory, or other legal support for Sierra Club’s petition, and in light of the detailed record supporting its decision, the Region committed no clear errors here.

BACKGROUND

The new unit at the Baytown plant will produce high-quality ethylene feedstock for plastics production, allowing ExxonMobil to meet the growing international demand for plastics products. Motion for Expedited Review, Dkt. No. 8 (filed Jan. 16, 2014) ¶ 1. Construction of the project alone will create approximately 3,100 construction jobs, plus 8,800 indirect and induced jobs, while adding an estimated \$1.41 billion in to the gross domestic product. *Id.* ¶¶ 4.a., c. The operational phase of the project will add more jobs to the economy and

significantly more to the gross domestic product. *Id.* The Permit establishes separate BACT emission limitations for carbon dioxide equivalent (“CO₂e”), including emissions of carbon dioxide, methane, and nitrogen dioxide from 22 separate emission sources at the ethylene production unit. A.R.V.01 at 7-8. To achieve these BACT emission limitations, the Permit implements requirements such as the use of low-carbon fuel in the furnaces and the duct burner; furnace stack temperature limit to monitor energy efficient operations; a thermal efficiency limit to monitor energy efficient operation of the duct burner; and—significantly—the use of flare gas recovery.¹ A.R.V.01 at 7-8.

Sierra Club, in comments to the Region, objected to the draft permit’s GHG BACT limit. A.R. V.02. In this appeal, it raises some of the same issues before the Board, focusing strictly on the Region’s decision to reject CCS—a complicated control technology that has never been used at this type of facility and that has not even been proposed for use by EPA at power plants that combust hydrocarbon gases.² Here, the Region rejected CCS during the BACT Step 4 collateral impacts analysis on two grounds. First, it found that implementing CCS would increase

¹ This is the first time to ExxonMobil’s knowledge that flare gas recovery has been determined as BACT in a GHG permit at an ethylene production unit. The individual CO₂e BACT emission limitations are applicable to the steam cracking furnaces, the furnace decoke vents, an elevated flare, a ground flare, the Train 5 duct burner, backup generator engines, and the firewater booster pump engines. The Permit also requires implementation of a leak detection and repair system as a work practice standard to reduce fugitive emissions. The BACT requirements are summarized in Table 1 of the Permit. A.R.V.0.1 at 7-8. Nothing in the Sierra Club’s petition for review challenges the specific CO₂e limits or the fugitive emission work practice standard; instead, its focus is on the Step 4 economic analysis of CCS as a whole.

² Indeed, EPA’s proposed New Source Performance Standards for new electric utility generating units determined, after an extensive analysis of the state of CCS technology in the United States and internationally, that any requirement for CCS should not include gas-fired power plants. 79 Fed. Reg. 1,430 at 1,432, 1,436 (Jan. 8, 2014). Specifically, the agency found that CCS should not be required for gas-fired utilities because “CCS has not been implemented for [natural gas combined cycle] units, and we believe there is insufficient information to make a determination regarding the technical feasibility of implementing CCS at these types of units.” *Id.* at 1,436. The Agency also noted the difficulty of adapting CCS to facilities with low concentrations of CO₂ in their exhaust streams, *id.*, such as the ethylene production unit.

emissions of nitrogen oxides, carbon monoxide, volatile organic compounds, particulate matter (10 micron), and sulfur dioxide by more than 11% in an ozone non-attainment area. A.R. III.03 at 10. Sierra Club does not challenge that determination here. Second, after analyzing extensive technical and cost data supplied by ExxonMobil, and other information that comprises the thorough administrative record, the Region concluded the CCS “costs are prohibitive in relation to the overall cost of the proposed project.” *Id.*

Sierra Club raises several arguments in its attempt to compel re-examination of CCS. In doing so, it largely reasserts comments that it made during the permitting process while ignoring the Region’s analysis of the record and response to comments. In short, the Region’s decisions are supported by an extensive and thorough record and are well within the bounds of reasonableness that governs this Board’s review. Sierra Club’s positions, which are directed less at challenging specific permit limits and more toward inviting the EAB to alter the BACT process to make selection of CCS more likely, are wholly unsupported by the text of the Clean Air Act, are not governed by any EPA regulation, are not compelled by any guidance documents, or supported by the administrative record. Sierra Club thus fails to meet its heavy burden of demonstrating that the Region’s decisions are clearly erroneous or unsupported by the record. Furthermore, Petitioner wrongly asks the Board to reverse the Region’s determinations on highly technical matters in contradiction of the deference the Board customarily affords to the expertise and experience of the Region’s staff. For all of these reasons, as discussed below, the Board should deny the petition for review.

STANDARD OF REVIEW

The Board will not grant review 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. 40 C.F.R. § 124.19(a)(1)–(2); *In re Prairie State Generating*

Co., 13 E.A.D. 1, 10 (EAB 2006). The petitioner has the burden of demonstrating that review is warranted. 40 C.F.R. § 124.19(a); *In re EcoEléctrica L.P.*, 7 E.A.D. 56, 61 (EAB 1997). In doing so, the petition for review must demonstrate, with specific citations to the administrative record, that each issue it raises was previously raised during the public comment period. 40 C.F.R. § 124.19(a)(4)(B)(ii).

A petition for review must explain why the permitting authority's response to comments is clearly erroneous, *Prairie State Generating Co.*, 13 E.A.D. at 11, and a petitioner cannot meet that burden by simply re-stating objections from its comments. *Id.* Instead, the petitioner must "substantively confront the permit issuer's subsequent explanations," *In re Peabody W. Coal Co.*, 12 E.A.D. 22, 33 (EAB 2005), and, based on the administrative record, show that the permitting authority failed to exercise its "considered judgment." *In re Steel Dynamics, Inc.*, 9 E.A.D. 165, 191, 224–25 (EAB 2000). In evaluating a petition for review, this Board generally defers to the permitting authority's technical expertise and experience so long as it is supported by the record and not clearly erroneous. *In re Dominion Energy Brayton Point, LLC*, 12 E.A.D. 490, 510 (EAB 2006). Where discretion has been committed to the permitting authority, the Board will uphold the exercise of discretion so long as the permitting authority's decision is explained in, and supported by, the record and is not an abuse of discretion. *In re City of Palmdale*, PSD Appeal No., 11-07, Slip Op. at 8 (Sept. 17, 2012).

ARGUMENT

The Region correctly rejected CCS as BACT for the Baytown ethylene production unit. After an extensive technical and cost analysis that Petitioner largely ignores, the Region concluded that CCS, a technically complicated system that has never been used on an ethylene production unit anywhere in the world, was too expensive for the Baytown project. Sierra Club, however, objects to both the methodology and the substance of the Region's technical and cost

analyses. Each of its stated objections, however, are baseless, as they are either waived, fail to address the Region's response to comments and analysis in the record, or are unsupported by any legal authority or by the record.

I. THE REGION PROPERLY CONSIDERED THE TOTAL COST BASIS OF CCS IN ITS BACT STEP 4 ANALYSIS

Sierra Club incorrectly claims both that the Region was exclusively *required* to consider the comparative cost-effectiveness of CCS (*i.e.*, the cost of each ton of pollutant removed compared to that of other projects) instead of the total cost of CCS, and that the Region refused to even calculate this metric. Petition for Review (“Pet.”) at 12, 16 (Table). For the reasons outlined below, these claims must fail. First, as a factual matter, the Region did adopt a cost-effectiveness value for CCS in this case, although it did not base its decision to reject CCS in Step 4 on cost-effectiveness for the reasons described below. Second, no statute or regulation requires a permitting authority to base its economic analysis for GHG controls on cost-effectiveness as Petitioner advocates. And third, because there are no similar sources using CCS, a comparative cost-effectiveness analysis for the project would have been impossible.

A. The Region Included the Cost-Effectiveness of CCS in the Record

Sierra Club's claim that the cost-effectiveness of CCS was never stated in the record below is false. According to Sierra Club's chart of facilities permitted by the Region, CCS cost-effectiveness for the Baytown ethylene production unit was allegedly “[n]ot included.” Pet. at 16 (Table). The Region, however, clearly stated in its response to comments document that “ExxonMobil calculated a cost effectiveness of ‘over \$253/ton CO₂e’ and we generally agree with their analysis.” A.R.V.02 at 15 (emphasis added). ExxonMobil also calculated an annualized capital and operating cost of \$205 million to capture, compress, and transport 90% of the CO₂ generated by the proposed project, as well as a total capital cost of \$735.4 million. A.R.

III.03 at 10; A.R.V.02. at 15.³ Thus, Sierra Club’s claims that the cost-effectiveness of CCS was “[n]ot included” in the Region’s analysis, and that the absence of this data could potentially hinder future BACT analyses for other facilities, Pet. at 14-18, are clearly inaccurate.⁴

B. The Region Was Not Required to Rely on Cost-Effectiveness in Its Economic Analysis of GHG Controls

Sierra Club incorrectly claims that weighing the cost of GHG controls against the total project cost “is not a valid basis for rejection in step 4 of the BACT analysis.” Pet. at 12. But the Sierra Club can find no solace for its argument in the text of the Clean Air Act or EPA’s implementing regulations. Section 169(3) of the Clean Air Act, provides only that BACT is determined “on a case-by-case basis, taking into account ... *economic impacts and other costs.*” 42 U.S.C. § 7479(3) (emphasis added). The statute (as well as EPA’s implementing regulations) says nothing about cost-effectiveness as the only measure of cost.⁵ In fact, in the most literal sense of the words chosen by Congress, “cost” means “the amount or equivalent paid or charged for something.” Webster’s New Collegiate Dictionary (1977) at 257. Because § 169(3) does not

³ These costs do not account for an addition \$460 million in estimated pipeline infrastructure costs to transport CO₂ to non-commercial storage facilities should closer, commercial options not be available. *See* A.R.V.02 at 15 (“[t]hese economic costs were developed under the assumption that the source could deliver CO₂ gas to the Denbury Green Pipeline for EOR purposes and that it had a viable customer to purchase the CO₂.”); *see also* A.R.I.01 at 4-6 (estimating a cost of \$460,000,000 to build a pipeline to the nearest suitable CO₂ storage site if the Denbury pipeline is not available).

⁴ ExxonMobil likewise does not agree with Sierra Club’s largely policy argument that a cost-effectiveness value must be included for CCS so that future permitting agencies may take that value into account during future BACT analyses, regardless of whether that figure would have made a difference in this proceeding. The issue here is whether the Region committed clear error in its BACT analysis for the Baytown ethylene production unit, not some hypothetical future proceeding. After all, BACT is fundamentally a “case-by-case” process. Nonetheless, the parties’ thrust and parry are mooted by the fact that the Region *did* adopt a cost-effectiveness value that could be referenced in future proceedings.

⁵ EPA’s implementing regulations, which are the only binding expression of EPA’s rulemaking authority on this topic, merely parrot the statutory BACT definition and thus offer Sierra Club no assistance. 40 C.F.R. § 52.21(b)(12).

unambiguously preclude the Region from considering total cost (*i.e.*, “the price of” or “amount of money that is needed to pay for” CCS) in the BACT analysis, the only question is whether the Region’s approach was reasonable. *See Chevron U.S.A., Inc. v. NRDC*, 467 U.S. 837, 843-44 (1984); *In re BP Cherry Point*, 12 E.A.D. 209, 220, n.30 (EAB 2005) (“Where the Agency encounters ambiguity in the governing statute, the Agency is generally free to adopt any *reasonable* interpretation....”). Here, Petitioner has not met its burden of showing that the Region’s interpretation is clearly erroneous, much less unreasonable.

In its BACT Step 4 economic analysis, the Region reasonably chose to examine the total cost of CCS as a percentage of the total cost of the project. A.R.III.03 at 10; A.R.V.02 at 15. Although, as discussed above, no statute or regulation mandates consideration of one form of costs over another, the Region’s use of a total cost basis for CCS was fully consistent with EPA’s most recent guidance on this issue. In its PSD and Title V Permitting Guidance for Greenhouse Gases (Mar. 2011) (“GHG Guidance”), the agency plainly recognizes that the CCS economic analysis need not always consider cost effectiveness but may instead look to whether CCS is “cost prohibitive” in an absolute sense—exactly what the Region did here. *Id.* at 42; *see also City of Palmdale*, Slip Op. at 54 (the GHG Guidance “contains additional GHG-specific BACT step 4 consideration” not included in the Draft NSR Manual).⁶ In fact, the Region engaged in a

⁶ Sierra Club’s reliance on the Draft NSR Manual is misplaced. *See, e.g.*, Pet. at 12. The Draft NSR Manual was published in 1990, has never been finalized or updated, and says on its face that “[i]t is not intended to be an official statement of policy and standards and does not establish binding regulatory requirements.” Draft NSR Manual at 1. This Board has never found the Draft NSR Manual to be binding on permitting agencies. *See, e.g., In re Knauf Fiber Glass*, 8 E.A.D. 121, 134 n.25 (EAB 1999) (the Board will “not reject a BACT determination simply because the permitting authority deviated from the [Draft] NSR Manual”). In fact, even the top-down approach to BACT is not mandatory. *Alaska Dep’t of Env’tl. Conservation v. EPA*, 540 U.S. 461, 476 n.7 (2004) (“Nothing in the Act or its implementing regulations mandates top-down analysis”). Were the manual applied in a binding manner by the Region or the Board, that document would be subject to being struck down as a rule promulgated without notice-and-

more thorough analysis than that required by the GHG Guidance, given the acknowledgement that, in some cases, even a “qualitative” (as opposed to “quantitative”) approach would be acceptable. GHG Guidance at 42.

The Region not only relied on the GHG Guidance in using total cost in its BACT Step 4 economic analysis, but it also noted that this Board has already allowed CCS to be eliminated when the total costs of the system are prohibitive. A.R.V.02 at 14 (citing *In re City of Palmdale*, Slip op. at 54-55). In fact, the GHG Guidance relied upon by the Region states that it “*expect[s]*” CCS to be eliminated under BACT Step 4 in most cases because it is typically cost prohibitive. GHG Guidance at 42-43 (emphasis added). Given the GHG Guidance, and this Board’s decision in *Palmdale*, the Region’s decision to focus on total costs instead of “further assess[ing] the cost-effectiveness of those disproportionately costly controls,” A.R.V.02 at 15, is reasonable and does not constitute clear error.

C. No Similar Sources Exist to Allow for a Comparative Cost-Effectiveness Analysis

A comparative cost-effectiveness analysis would have been futile, and therefore the Region’s decision to use total cost instead cannot be clear error. Sierra Club’s broad attack on the Region’s permitting practices generally, Pet. at 13-18, overlooks that cost-effectiveness is premised fundamentally on an evaluation of whether control costs “for the pollutant [are] within

comment rulemaking. *See, e.g., Appalachian Power Co. v. EPA*, 208 F.3d 1015, 1025-28 (D.C. Cir. 2000). To the extent that the Draft NSR Manual can guide or inform permitting authorities, the GHG Guidance is more current and specifically pertains to GHG BACT issues; thus, it controls over the manual. *Cf. Morales v. Trans World Airlines*, 504 U.S. 374, 385 (1992) (“it is a commonplace of statutory construction that the specific governs the general”). Finally, Sierra Club is not correct, in any event, that the Draft NSR Manual unambiguously and exclusively requires cost-effectiveness analyses. *Id.* at B.31 (noting cost-effectiveness is generally used where “a control technology has been successfully applied *to similar sources in a source category*” (emphasis added)). Here, as discussed in detail below, CCS has *not* been “successfully applied to similar sources in the source category.”

the range of costs being borne by *similar sources* also charged with controlling that pollutant.” *Inter-Power of New York, Inc.*, 5 E.A.D. 130, 135 (EAB 2002) (emphasis added). This is equally true when evaluating cost-effectiveness for potential GHG controls, given that it is expressly stated in the GHG Guidance: cost effectiveness determinations are “typically made by considering previous regulatory and permitting decisions for *similar sources*.” *Id.* at 42 (emphasis added). But in the case of the Baytown ethylene production unit, there are no similar sources using CCS.

In its response to comments, the Region explained that “there were no global examples where capture of CO₂ from a low pressure, low CO₂ concentration flue gas has been demonstrated at a scale and reliability necessary for application in a compliance-based scenario.” A.R.V.02 at 14. It continued in the record to explain how the facilities cited by commenters were not comparable to the Baytown ethylene production unit because they had higher CO₂ concentrations in their exhaust streams, making that pollutant easier to recover were CCS used. *Id.* at 14-15. Based on the record, the Region concluded that “integrated CCS for a steam cracking unit has not been demonstrated in practice and *does not currently exist at any scale*.” *Id.* at 15 (emphasis added).⁷

In its petition for review, Sierra Club does not dispute any of the above findings in any way and thus fails to “substantively confront the permit issuer’s subsequent explanations.” *In re Peabody W. Coal Co.*, 12 E.A.D. at 33. The petition for review does not identify a single similar source that would allow the Region to make a CCS cost-effectiveness comparison for the

⁷ For this and other reasons, ExxonMobil does not agree that CCS is “available” within the meaning of the Clean Air Act and asserts it should have been eliminated in Step 2 of the BACT process. A.R.I.01 at 4-7; A.R.I.03 at 4. However, because the Permit was ultimately issued, ExxonMobil was not adversely affected by the Step 2 decision. ExxonMobil reserves all of its rights to contest whether CCS is “available” for application to an ethylene production unit (or any other facility) in any relevant proceeding.

Baytown ethylene production unit. The Draft NSR Manual section relied on by Sierra Club advises that “where a control technique has been applied” in limited circumstances there may be “characteristics unique to those sources that may have made the application of the control appropriate in those cases but not for the source under consideration.” Draft NSR Manual at B.29. Here too, the Region pointed to CCS projects in development that were distinguishable from the proposed ethylene production unit because CCS projects were funded by the U.S. Department of Energy and the CO₂ streams for those projects had much higher CO₂ concentrations in their exhaust gases (ranging from 14% to 45%, compared to the 4.7% to 8% for the ethylene production unit), making it much easier to capture CO₂. A.R.V.02 at 15.

Instead of addressing the Region’s response, Sierra Club provides a chart of 19 other projects recently permitted by the Region. These facilities are irrelevant to a cost-effectiveness analysis for CCS as none of them are identified as being similar to the Baytown ethylene production unit and *none of them use CCS*.⁸ Thus, even if Sierra Club had the cost-effectiveness information for these 19 other projects, Pet. at 17, it would not allow for any useful comparison as the chart is populated by *dissimilar* sources. Furthermore, this chart was never included in comments to the Region, meaning that Sierra Club is now prohibited from relying upon it in the petition for review. 40 C.F.R. §§ 124.13, .19(a), *In re Christian County Generation, LLC*, 13 E.A.D. 449, 457 (EAB 2008). Without any record evidence demonstrating that the Region could have made a CCS cost-effectiveness comparison between the Baytown ethylene production unit and other similar sources, Sierra Club has failed to “confront the [Region’s] subsequent

⁸ In the response to comments the Region lists five other ethylene production units where CCS has been eliminated on economic and other Step 4 grounds. A.R.V.02 at 15. Instead of evaluating the ExxonMobil ethylene production unit against the CCS analysis for those similar sources, Sierra Club includes the chart of 19 sources without any description of the source type or how the chart counters EPA’s case-by-case evaluation of CCS for similar ethylene production units. Pet. at 15-17.

explanation” of why a cost effectiveness comparison is not possible in this case. Thus, it cannot meet its burden in demonstrating that the Region’s decision was clear error.

Were the Region required to use a comparative cost-effectiveness analysis, the current lack of comparable data would render the exercise futile. Cost-effectiveness values are meaningless in a vacuum. For example, Sierra Club arbitrarily claims that the cost-effectiveness of CCS installation at the Air Liquide facility would be, at \$42 per ton, “relatively low.” Pet. at 23. Yet, without evidence of a similar source using CCS, there is no way to determine relativity (*i.e.*, “relatively low” compared to what?).⁹ The alleged “relatively low” cost-effectiveness of CCS for the Air Liquide facility would have resulted in control technology costs greater than *four times* the cost of the project itself, according to Sierra Club’s own table. Pet. at 15 (Table). The mere thought of selecting a \$100,000 catalytic converter for a \$25,000 car illustrates the fallacy of trying to assess cost-effectiveness without any context. Additionally, Sierra Club’s characterization of a certain value as “relatively low” conflicts with the GHG Guidance’s caution against requiring controls that are, in an absolute sense, “extraordinarily high” and “cost prohibitive.” GHG Guidance at 42. Thus, by asking for what would be an arbitrary metric for analyzing costs, Sierra Club fails to demonstrate that the Region’s use of total project cost is clear error.

⁹ Sierra Club off-handedly states that the Air Liquide’s cost-effectiveness number “is within EPA’s estimates for the social cost of carbon,” Pet. at 23, but does not explain why this is relevant. It is not. The social cost of carbon values are intended for use in cost-benefit analyses required by Executive Order for nationally-applicable rulemakings and have no applicability to case-by-case BACT determinations. *See*, EPA, The Social Cost of Carbon, *available at*, <http://www.epa.gov/climatechange/EPAactivities/economics/scc.html>.

II. THE REGION'S DETERMINATION THAT CCS IS COST PROHIBITIVE IS SUPPORTED BY THE RECORD

The Region reasonably determined that adding nearly three-quarters of a billion dollars in additional construction costs would be cost prohibitive and make the ethylene production unit economically unviable. In fact, the record demonstrates that CCS would increase the capital and operating cost of the project by more than 25%. A.R.III.03 at 10; A.R.I.03 at 25. The Region's conclusion that these costs would be prohibitive is consistent with the GHG Guidance, which stated that EPA "expect[s] that CCS will often be eliminated from consideration in Step 4 of the BACT analysis...." GHG Guidance at 42-43. Sierra Club challenges this determination by arguing that the Region unreasonably concluded that CCS was cost prohibitive because its capital cost as a percentage of total project cost (25%) is much lower than the Palmdale Hybrid Power Project analyzed in *City of Palmdale* (200%). Pet. at 21. Not only did Sierra Club waive this argument by not raising it during the public comment period, but it is also factually incorrect and unreasonable to compare directly CCS application for the Palmdale Hybrid Power Project to the ethylene production unit. The Region's determination that CCS is cost prohibitive is fully supported by the record.

A. The Record Supports the Region's Cost Estimate for CCS

Based on the administrative record, the Region found that the total capital cost for building a CCS unit capable of removing 90% of the Baytown ethylene unit's CO₂ emissions would be \$735.4 million. A.R.V.02 at 15. Furthermore, the annualized cost for the capital expenditure plus operating and maintenance costs totaled \$204.6 million. *Id.* These costs were calculated, in part, based on the fact that "carbon capture in this case would require 'first-of-a-kind' technology complicated by numerous emission points from the steam cracking furnace." *Id.* According to the Region's analysis, the total annual cost of CCS capital and operating

expenses (not including the \$460 million pipeline infrastructure costs to transport CO₂ to non-commercial storage facilities should closer, commercial options not be available¹⁰) “could increase the cost of the project by more than 25 percent” and that “such increases would make the project economically unviable.” *Id.*; A.R.III.03 at 10. Therefore, the record provides adequate information to estimate how much it would cost to construct and operate a CCS unit at the ethylene production unit.

B. The Region Reasonably Determined that the Costs for CCS Were Excessive

Given the high costs of CCS construction and operation, the Region reasonably concluded that CCS was cost prohibitive. A.R.V.03 at 15. This decision was based on extensive cost information provided by ExxonMobil, *see* A.R.I.01 at 4-4 to 4-8 (application BACT analysis); A.R.I.03 at 22-25 (ExxonMobil’s October 2012 supplemental submissions). ExxonMobil used recent CCS study cost estimates¹¹ as a guide and in accordance with the Draft NSR Manual’s guidance that applicants consult “[o]ther EPA sponsored costing studies” or “[o]ther engineering cost publications.” Draft NSR Manual at B.3. CCS cost estimates based upon these studies alone demonstrated that CCS was cost-prohibitive. A.R.I.01 at 4-7. Yet, instead of relying solely on these cost estimates, ExxonMobil supplied a site-specific CCS cost evaluation. A.R.I.03 at 18-25. It also provided a revised equipment and cost chart, *id.* at 23-25, that well exceeded the process provided in the Draft NSR Manual. *See* Draft NSR Manual at

¹⁰ *See* AR.V.02 at 15 (stating that “the economic costs were developed under the assumption that the source could deliver CO₂ gas to the Denbury Green Pipeline for EOR purposes and that it had a viable customer to purchase the CO₂; *see also* A.R.I.01 at 4-6 (estimating a cost of \$460,000,000 to build a pipeline to the nearest suitable CO₂ storage site if the Denbury pipeline is not available.)

¹¹ The initial May 2012 application estimated the CCS costs for the ethylene production unit based in part upon the US Department of Energy National Energy Technology Laboratory study, Estimating Carbon Dioxide Transport and Storage Costs, and the Interagency Task Force Report on Carbon Capture and Storage. A.R.I.01 at 4-6.

B.5. Based on these cost estimates, the Region concluded that, by increasing “total capital project costs by more than 25%,” CCS would be “prohibitive in relation to the overall cost of the proposed project.” A.R.V.III.03 at 10.

Sierra Club, however, argues that adding 25% to capital costs is not enough to render CCS cost prohibitive. Pet. at 21, 24-27. To make this argument, Sierra Club relies on *City of Palmdale* to assert that “the relative impact to project costs” for the Baytown ethylene production unit, at 25% “is much smaller” than that in *City of Palmdale*, which it claims to have been 200% of the project’s cost. Pet. at 21. This argument must fail for several reasons, foremost among them is that Sierra Club waived this issue—a comparison between the costs of CCS at Baytown versus the Palmdale Hybrid Power Project—by failing to raise it in its comments. 40 C.F.R. §§ 124.13, .19(a); *Christian County*, 13 E.A.D. at 457.¹²

Even if the Board was inclined to consider Sierra Club’s argument, it is based on a misapplication of *City of Palmdale* decision. In that case, the permitting authority compared CCS *annual operating costs* (\$78 million) to *annualized project capital costs* (\$35 million). *City of Palmdale*, Slip Op. at 53. Those are *not* the same cost metrics used by the Region here and Petitioner’s effort to create an apples-to-apples comparison necessarily fails. In this case, the Region compared un-annualized total CCS capital costs to un-annualized total project costs. A.R.V.02 at 15 (estimated “total capital expenses of constructing a carbon capture system” were \$735.4 million, which would increase “the cost of the project by more than 25 percent”). These two sets of values differ substantially (given that annualized costs must be computed using

¹² Sierra Club attempts to distinguish the Baytown facility cost analysis from the *City of Palmdale* decision by characterizing the total costs of the Baytown project as “modification” costs, not “total facility costs.” Pet. at 21. Sierra Club is mistaken. The Baytown project is an entirely new ethylene production unit co-located at an existing ExxonMobil plant. It is not, as implied by Sierra Club, a “modification.” See A.R.III.03 at 4-6 (describing project).

assumptions about interest rates and annuity values using standard financial calculations), and thus Sierra Club cannot legitimately compare the CCS costs from these two different projects. Further, even if the Region did use the same cost metrics here as the permitting authority did with Palmdale, comparing the cost impacts of an ethylene production unit to a natural gas and solar power plant, *City of Palmdale*, Slip Op. at 1, is arbitrary and unjustified. These are two completely *dissimilar* sources and Sierra Club fails to explain why any comparison between the two¹³ would aid in determining whether CCS should or should not be eliminated for the ethylene production unit under BACT Step 4. *See supra* Argument I.D. Therefore, even if the Board were to address the substance of Sierra Club's argument (which it waived), the petition for review fails to identify any clear error in the Region's analysis.

Sierra Club also baldly asserts that there is "no evidence that an increase of 25% to total project costs would render the Baytown project uneconomic." Pet. at 25. Sierra Club's argument incorporates a legally unsupported presumption that a control technology can *only* be eliminated for cost reasons under BACT Step 4 if those costs are high enough to make the project unviable. The Clean Air Act only requires permitting authorities to "*tak[e] into account ... economic impacts and other costs*" of pollution controls. 42 U.S.C. § 7479(3) (emphasis added). The Draft NSR Manual provides little further guidance, stating only that pollution controls can be eliminated under BACT Step 4 if costs are "inappropriate." *Id.* at B.8. Sierra Club cites to no statute, regulation, guidance document, or Board decision requiring permitting authorities to eliminate a control technology only when it is so prohibitively costly that it would

¹³ *See* A.R.V.02 at 14 (comparing the application to other similar facilities recently permitted to conclude that the CCS technology "has not been demonstrated in practice and does not currently exist at any scale" for steam cracking furnaces).

effectively cancel the project. The Region here met its legal obligation by appropriately “taking into account” economic information about CCS as part of its Step 4 BACT analysis.

Even if the Region were required to demonstrate that CCS would make the project economically unviable, there is ample evidence for this conclusion in the record. Despite Sierra Club’s claim that there is “no evidence” in support of the Region’s conclusion, the petition for review promptly contradicts itself by pointing to a submission from ExxonMobil which states that the additional CCS costs would likely lead to the project’s cancellation. Pet at 25. (citing A.R.I.12); *see also* A.R.V.02 at 12 n. 12. The petition for review also omits other evidence in the record demonstrating that CCS would make this project cost prohibitive. *See* A.R.V.03 at 23 (“The total cost for carbon capture is \$735,400,000. This is an extraordinarily high cost and would render the proposed project economically unviable if selected.”); *id.* at 25 (“An annualized CCS cost of \$204.6 million dollars would render the proposed project unviable, even for this multi-billion dollar investment proposed by ExxonMobil.”). Thus, there are multiple statements in the record supporting the Region’s conclusion that CCS is cost prohibitive.

In reality, Sierra Club seeks to second guess the Region’s conclusion by challenging the sufficiency of the evidence. It claims that a permitting authority can only support the exercise of its discretion under BACT Step 4 through an analysis of “what the impact would be on the competitiveness of Exxon’s products from the plant, or what the ‘threshold’ is that would render the project economically unviable.” Pet. at 26. The petition for review, however, cites to no statute, regulation, guidance document, or Board decision requiring such extensive commercially sensitive documentation in order to support a permitting authority’s decision under BACT Step

4.¹⁴ The GHG Guidance, and this Board’s decision in *City of Palmdale* leave it to the permitting authority’s discretion to determine when CCS costs are “extraordinarily high” and “cost prohibitive.” *City of Palmdale*, Slip Op. at 54-55 (quoting GHG Guidance at 42).

For BACT Step 4 analyses, “permitting authorities have ‘a great deal of discretion’ in deciding ... the weight to be given to the particular impacts under consideration.” GHG Guidance at 41. Given the Board’s recent decision in *City of Palmdale*, which affirmed a similar conclusion for CCS, and the GHG Guidance’s presumption that CCS systems would be cost prohibitive in most situations, the Region’s exercise of discretion in this case was imminently reasonable. The permitting authority’s “evaluations of economics” must be upheld so long as it “explain[s] its decisions in a well-documented permitting record.” *Id.* Moreover, Sierra Club submitted no competent evidence in its comments or elsewhere that would rebut the record supporting the Region’s decision. Thus, Sierra Club cannot cite any contradictory record evidence to support its burden of establishing that review is warranted, 40 C.F.R. § 124.19(a); *In re EcoEléctrica L.P.*, 7 E.A.D. at 61. Given the expanse of the record in this case, there is no basis to claim that the Region lacks evidence in support of excluding CCS under BACT Step 4.

The Board decisions cited by Sierra Club are inapposite. *In re General Motors*, 10 E.A.D. 360, 372-373 (EAB 2002), involved a matter where the permitting agency relied solely on the incremental costs and failed to distinguish how the control was economically infeasible when the average cost of control fell “well within the cost range for VOC controls that the

¹⁴ Under Sierra Club’s approach, permit applicants would be forced to reveal confidential business information regarding the economic competitiveness of planned facilities and the products they would produce. All of this information would become public as part of the administrative record. Not only would the Sierra Club’s requested documentation be a treasure trove of information for ExxonMobil’s competitors, but it would also inform project opponents exactly how much in costs and delays they could extract from a permit applicant before the applicant is forced to cancel the project.

[permitting authority] has found acceptable in previous BACT determinations”; the Region here did no such thing. *In re Steel Dynamics, Inc.*, 9 E.A.D. 165, 204-205 (EAB 2000), concerned a determination that controls were cost prohibitive but that did not evaluate cost data on similar controls implemented at similar sources, even if such technologies were implemented voluntarily; again the Region here did no such thing. Instead, the Region determined that CCS has not been installed on any ethylene production unit, anywhere, for technical reasons. The Petitioner has not countered this conclusion. A.R.V.02 at 14-15.

Finally, *Alaska Department of Environmental Conservation (“ADEC”) v. EPA*, 540 U.S. 461, 498 (2004), turned on “ADEC’s switch from finding [selective catalytic reduction] economically feasible in May 1999 to finding [selective catalytic reduction] economically infeasible in September 1999” without any “factual basis in the record.” There, ADEC made the switch after initially stating that selective catalytic reduction technology “was technically and economically feasible and had already been installed on similar diesel generator engines around the world.” *Id.* at 476, 496. When determining the selective catalytic reduction technology was not BACT, ADEC openly acknowledged that “no judgment could be made as to the impact of” the control technology’s “cost on the operation, profitability, and competitiveness of the Red Dog Mine.” *Id.* (internal quotations omitted). In contrast, the Region here relied on a well-documented cost analysis derived from complex engineering details, the absence of similar sources using CCS, and this Board’s guidance in *City of Palmdale*. Its conclusion was consistent with EPA’s GHG Guidance. GHG Guidance at 42-43. The Region did not contravene any holding of *Alaska Department of Environmental Conservation*.

Sierra Club also lists pollution control costs from selected *enforcement matters* in an attempt to argue that extraordinarily high costs are routinely accepted under BACT Step 4. Pet.

at 19-20. As an initial matter, Sierra Club waived this argument by not presenting it in its comments to the Region, 40 C.F.R. §§ 124.13, .19(a), *Christian County*, 13 E.A.D. at 457. Furthermore, it cites to no statute, regulation, guidance document, or Board decision that has ever used the results of enforcement actions in evaluating costs under BACT Step 4. Nor would doing so be appropriate. Enforcement fundamentally involves the exercise of discretion, settlements involve compromise, and judicial relief is not limited to BACT.¹⁵ EPA often takes the position that past violations must be remedied, in part, through the recoupment of past excess pollution, and one way for a defendant or respondent to do so is to agree to perform more than may be otherwise be required. These settlements are clear that they are *not* permit decisions and therefore cannot be used for determining BACT. Even taking Sierra Club's two listed examples at face value, however, does not support its argument. The Tennessee Valley Authority decision cited by Sierra Club, aside from being reversed as unconstitutional, *TVA v. Whitman*, 336 F.3d 1236 (11th Cir. 2003), involved pollution controls for nine separate facilities, not one. *Id.* at 1239. The Ohio Edison settlement cited by Sierra Club also involved multiple plants.¹⁶ None of these settlements demonstrate that the Region's decision that CCS is cost prohibitive for the ethylene production unit amounted to clear error.

¹⁵ The CAA merely provides that courts may enter "appropriate" relief for violations of the Clean Air Act or existing permits. 42 U.S.C. § 7413(b). Courts do not make BACT decisions, nor do they issue permits. Thus, any injunctive relief ordered in an enforcement case is not a BACT determination.

¹⁶ *See* EPA, U.S. Announces Settlement of Landmark Clean Air Act Case Against Ohio Edison (Mar. 18, 2005) ("The consent decree agreed to by Ohio Edison will reduce emissions ... from the Sammis plant, as well as from other Ohio Edison and FirstEnergy coal-fired power plants.").

III. THE REGION DID NOT COMMIT CLEAR ERROR IN THE CALCULATION OF CCS COSTS

Based on the record, the Region determined that CCS could increase the capital cost of the project by more than 25%. A.R.III.03 at 10. Sierra Club raises several arguments asserting that the estimated cost of CCS in the record were incorrect, but each must be rejected. First, Sierra Club argues that the Region was required to adopt certain accounting methods in an EPA cost control manual even though that manual has no applicability to either BACT or GHG controls. Second, without any legal or factual support, Sierra Club asserts that the Region was required to assume that ExxonMobil could offset CCS costs by selling captured CO₂ for enhanced oil recovery (“EOR”) and take advantage of various tax credits. Third, Sierra Club errantly claims that the Region “essentially ignored” its comments regarding how GHG emissions from the boiler needed to power a CCS unit factored into the Region’s cost analysis. Lastly, Sierra Club makes several baseless complaints about the quality of the data used in the Region’s cost calculations. For the reasons discussed below, the Board should reject these arguments.

A. The Region is Not Required to Use the EPA Cost Control Manual

The Petitioner argues that the Region committed clear error by failing to use accounting methodologies supposedly “required” by the EPA Air Pollution Control Cost Manual (6th ed. 2002) (the “Cost Manual”). Pet. at 34-41 (arguing that Region was compelled to use Cost Manual methods for overnight costs and annualized capital costs). The Cost Manual was created to inform nationally-applicable regulatory decisions that “*do not require* detailed site-specific information....” Cost Manual at 1-4 (emphasis added). Further, the Cost Manual—last updated in 2002—contains *no information* on GHG controls. Nevertheless, Sierra Club argues that the

Region incorrectly rejected the use of the Cost Manual. *See* A.R.V.02 at 19-20. The Board should reject this argument for the reasons set forth below.

1. The Cost Manual is Not Required for BACT Determinations

Nothing in the Clean Air Act or EPA's implementing regulations require permitting authorities to use the Cost Manual. *See* 42 U.S.C. § 7479(3) (permitting agencies need only consider "economic impacts and other costs...."); 40 C.F.R. § 52.21(b)(12) (same). Indeed, Sierra Club did not cite to *any* statute, regulation, EPA guidance document, or Board decision requiring permitting authorities to even consider the Cost Manual, much less use it to the exclusion of alternative cost methodologies, and no such authority exists. If EPA wanted to require permitting authorities to use the Cost Manual, it could have proposed a rule to that effect. For instance, the Regional Haze Program regulations at 40 C.F.R., Part 51, Appx. Y(IV)(D)(4)(a) specifically require the use of the Cost Manual in calculating pollution control costs. A similar requirement is conspicuously absent from the PSD regulations and should not be inferred. *Cf. Russello v. United States*, 464 U.S. 16, 23 (1983) (where particular language is included "in one section of a statute but omit[ted] in another section ... it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion or exclusion.") (internal quotations omitted); *Whitman v. Amer. Trucking Assns, Inc.*, 531 U.S. 457, 467-68 (2001) (court rejected an implicit authority to consider costs under one section of the Clean Air Act when that authority was expressly granted in other sections). Sierra Club's reliance on *Oklahoma v. EPA*, 723 F.3d 1201, 1213 (10th Cir. 2013), Pet. at 37-38, is therefore inapposite as that was a Regional Haze case where states are largely required to follow the Cost Manual's methodology. There is no similar requirement under the separate and distinct PSD program.

Despite Sierra Club’s claim, Pet. at 34, the Draft NSR Manual does not mandate the use of the Cost Manual.¹⁷ Instead, the Draft NSR Manual merely states that the Cost Manual is an *option* for documenting control costs, mostly relating to equipment design and installation costs, not a requirement.¹⁸ Draft NSR Manual at B.33. It is not even a commonly used option. A search of this Board’s published PSD permitting decisions yielded no mention of the Cost Manual and Sierra Club cites to none. Therefore, the Region’s decision not to use the Cost Manual for pricing CCS costs is not clear error.

2. The Cost Manual is Not Useful for Pricing CCS Costs

Even if the Region consulted the Cost Manual, it would find nothing of value in performing its Step 4 BACT analysis for CCS. As the Region correctly noted in its response to comments, the Cost Manual expressly states that “*new and emerging technologies are not generally in the scope of this Manual*” and that “control devices included in this Manual are generally well established devices with a long track record of performance.” A.R.V.02 at 19 (emphasis added). The Cost Manual, last revised in 2002, predates GHG regulation and does not include any pollution control equipment to reduce GHG emissions. *See* Cost Manual at 1-3 (covering control technologies for volatile organic compounds, particulate matter, nitrogen oxide, and some acid gases). Thus, as the Region explained, permit applicants and permitting authorities rely upon “the best available information on costs for CCS technology,” including government studies specifically addressing CCS costs. A.R.V.02 at 19.

The Region further explained in its response to comments that using the Cost Manual, when no other permitting authority had materially relied upon it, would undermine the need for

¹⁷ Nor could it, given that the Draft NSR Manual is not a binding regulation. *See supra* n.4.

¹⁸ Sierra Club’s arguments relating to overnight costs, interest rates and cost recovery factors, Pet. at 35-40, are not applicable to the total capital cost calculation as those factors are only used in determining annualized costs. *See* Cost Manual at 2-10 to 2-23.

relative consistency in how Step 4 analyses are performed. *Id.* The petition for review fails to address the Region’s response to comments on this issue. *See In re Peabody W. Coal Co.*, 12 E.A.D. at 33 (petitions must “substantively confront the permit issuer’s subsequent explanations”). For that reason alone the petition for review on this point should be denied. However, even if Petitioner had preserved the argument, the Region abundantly documented in the Record the lack of utility of employing the Cost Manual here.

B. The Region Was Not Required to Include Speculative Cost Offsets From CO₂ Sales and Tax Credits

Sierra Club argues, without any legal or factual support, that the Region was required to assume that the Baytown ethylene production unit could (1) sell captured CO₂ to another company for EOR, and (2) offset its costs through various tax credits. Pet. at 21-22, 39. This argument must be rejected for several reasons. First, the Region’s cost estimate *did* include an assumption that Baytown could sell CO₂ for EOR. *See* A.R.V.02 at 15 (“These economic costs were developed under the assumption that the source could deliver CO₂ gas to the Denbury Green Pipeline for EOR purposes and that it had a viable customer to purchase the CO₂.”); A.R.I.03 at 22 (ExxonMobil supplemental information supplied to the Region). The Region explained, however, that it was not *required* to include such an assumption given that the price of captured CO₂ varies widely and would ultimately depend on hypothetical negotiations with another private entity, assuming that demand for captured CO₂ even exists. A.R.V.02 at 10-11. Yet, even when these speculative values were included, the Region determined that hypothetical revenue from captured CO₂, potentially ranging from \$16 million to \$32 million per year, would not materially offset the massive \$204.6 million in total annual costs. *Id.*

As for Sierra Club’s claim that the company could partially offset its CCS costs through income tax credits, Pet. at 22, 39, the Region explained that income taxes are typically not

included in BACT Step 4 cost analyses due to “the long-term uncertainty, speculativeness, and over-complexity of these considerations....” A.R.V.02 at 11 (citing Draft NSR Manual at B.11). It further explained that incorporating tax credits would require the Region to make unsupported assumptions about the amount of CO₂ the project could capture and whether Baytown could find a willing buyer or geologic storage location. *Id.*¹⁹ Even then, the tax credits of approximately \$24 million would still not significantly reduce the cost of CCS. *Id.*

In the face of the Region’s extensive responses to Sierra Club’s comments on the EOR and tax credit issues, the petition for review must be denied. The petition simply regurgitates Sierra Club’s comments on this issue and did not address the Region’s response. It has thus failed to “substantively confront” the Region’s explanations. *In re Peabody W. Coal Co.*, 12 E.A.D. at 33. Even if this failure had not effectively waived these arguments, this Board has already held that permitting authorities are not required to incorporate hypothetical offsetting revenues or subsidies in their cost estimates. *City of Palmdale*, Slip Op. at 56 (permitting authority not required to consider “the mere possibility that” the permit applicant “might be able to obtain additional funding for CCS” through grants or EOR sales). Therefore, the Board should reject Sierra Club’s argument on these points.

C. The Region’s Treatment of the CCS Boiler Was Not Clear Error

Sierra Club errantly claims that the Region inflated the CCS cost analysis by assuming that a boiler would be needed to power the CCS unit and assuming that its GHG emissions would need to be captured as well. Pet. at 41-45. When Sierra Club raised this issue in its comments, the Region noted that accounting for the capture of boiler GHG emissions was a

¹⁹ Furthermore, constructing a pipeline to store captured CO₂ at a geological storage facility was estimated to add an additional \$460 million to the project’s cost. I.01 at 4-3, 4-5 to 4-6 (PSD permit application). This is exclusive of the actual storage costs.

necessary part of the BACT cost analysis. A.R.V.02 at 23. Sierra Club now raises several arguments contesting the Region's treatment of the CCS boiler, each with significant defects.

First, Sierra Club disputes the need for a CCS boiler. Pet. at 42. This argument is easily rejected because the petition for review makes no argument explaining why the boiler would be unnecessary, does not cite to any portion of the administrative record in support of its position, and does not otherwise "substantively confront" the Region's explanation for the boiler's need. *In re Peabody W. Coal Co.*, 12 E.A.D. at 33. Without responding to the Region's rationale in the record, Sierra Club cannot demonstrate that it was clearly erroneous to include a boiler for power generation.

Second, Sierra Club argues that Step 1 of the top-down BACT process prohibits such an accounting because the CCS boiler, as part of a control system, must be subject to a wholly separate BACT analysis. Pet. at 41-43. This argument, however, was not raised in the comments below and is, therefore, waived. 40 C.F.R. §§ 124.13, .19(a); *Christian County*, 13 E.A.D. at 457. Even if Sierra Club preserved some argument that the Region was required to consider the possibility that the CCS boiler would not require its GHG emissions to be captured, it has not provided any substantive argument, or cited to any portion of the record, explaining how this would impact the cost analysis. Instead Sierra Club repeats the general assertion, which has already been countered by the Region in the record, that not capturing the CCS boiler's "lower-purity and more expensive waste stream" would lower CCS costs, Pet. at 42. EPA stated in the response to comments that the boiler's CCS stream would *not* be a lower concentration stream. A.R.V.02 at 23, n.23. As explained by ExxonMobil, the CO₂ concentration in the exhaust stream of both the boilers and the furnaces is based upon the fuel gas used by the sources. A.R.I.17 at 5. The CO₂ concentration in the boiler and the furnaces exhaust stream are

assumed to be the same because both sources will use the same blended fuel gas (a blend of natural gas and tail gas). *Id.* ExxonMobil's October 2012 CCS cost analysis was based upon the fact that the sources will have the same CO₂ concentration in the respective exhaust streams and therefore does not artificially inflate the cost per ton of CO₂e removed. *Id.* citing A.R.I.03 at 22. The petitioner has not responded to EPA's response on this issue nor has it provided a "compelling reason to believe that" permitting authority error "led to an erroneous permit determination – in other words ... materially affected the quality of the permit determination." *In re Steel Dynamics, Inc.*, 9 E.A.D. at 191-92; *see also In re BP Cherry Point*, 12 E.A.D. at 228 (denying review where petitioner "does not argue with specificity" why the permitting authority's conclusions were clearly erroneous). Further, significant discretion is afforded permitting authorities in evaluating the "'logical group' of emission units in each industry on a reasonable case-by-case basis...." *In re Gen. Motors, Inc.*, 10 E.A.D. 360, 382-83 (EAB 2002) (quoting Draft NSR Manual at B.10). Sierra Club cannot demonstrate that the Region's treatment of the CCS boiler was clearly erroneous or an abuse of its discretion with such unsupported and speculative arguments.

Third, Sierra Club wrongly asserts that the Region "essentially ignored" its comments on this issue. Pet. at 44. While Sierra Club may disagree with the substance of the Region's response, it had no factual basis to claim that the Region failed to respond. Sierra Club's comments consisted of little more than a command that the Region "should not combine" the ethylene production unit and CCS boiler exhaust streams and speculation, without any supporting documentation, that the CCS unit's costs may be overestimated by some unspecified

amount. A.R.V.02 at 12-13.²⁰ The Region responded that failing to include captured GHG emissions from the boiler “would not fully account for the prospective economic, energy, and environmental impacts of applying CCS as a control option for this project.” *Id.* at 23. The Region responded as thoroughly as possible given the comments’ vague, imprecise, and unsupported nature. *See, e.g. In re RockGen Energy Center*, 8 E.A.D. 536, 547-48 (EAB 1999) (“Absent such specificity, the permit issuer cannot meaningfully respond to comments”). Sierra Club’s petition for review does not “substantively confront” the Region’s rationale that assuming the CCS boiler’s GHG emissions to be uncontrolled would underestimate CCS costs. *In re Peabody W. Coal Co.*, 12 E.A.D. at 33. Without any factual support, in either its comments or petition for review, as to how the combination of the exhaust streams may impact the costs of the CCS unit, and that this difference in costs may materially affect the Region’s determination, Sierra Club has not established any justification for remanding the permit for further response.

Fourth, Sierra Club demands more details in support of ExxonMobil’s October 16, 2012 calculations regarding how much CO₂ would be individually captured from the steam cracking furnace and the CCS boiler, complaining that “it is impossible to understand the different engineering designs, capital costs, and operating costs of those two apparently separate units.” *Pet.* at 44. This argument, however, was not raised in Sierra Club’s comments below and is, therefore, waived. 40 C.F.R. §§ 124.13, .19(a); *Christian County*, 13 E.A.D. at 457. Contrary to paragraph seven of this Board’s March 27, 2013 standing order, Sierra Club does not “demonstrate, by specific citation to the administrative record” that this issue “was either raised during the public comment period ... or was not reasonably ascertainable.”

²⁰ Any notion that the Region was compelled to treat the CCS boiler’s emissions in any particular manner, for cost estimation purposes, is baseless. As with most of Sierra Club’s other arguments, nothing in the text of the Clean Air Act, EPA regulations, guidance documents, or this Board’s opinion support Sierra Club’s position on this issue.

Even if Sierra Club had not waived this argument, there would be no basis to require permitting agencies to gather so much additional minutiae at the request of commenters. *See* Pet. at 45 (demanding “[a]t a minimum” the “design details and costs of” the separate steam cracking furnace and CCS boiler streams as well as separate cost-effectiveness analyses for each). As noted above, Sierra Club provides no explanation or citation to the record explaining why such additional details would make a material difference in assessing the total cost of CCS. Given that no source similar to the ethylene production unit has ever used CCS, the absence of even more detailed engineering and cost specifications in this case cannot establish clear error.

D. The Record Included Ample Information to Allow for Public Comment on the CCS Unit’s Hypothetical Design and Cost Estimates

The petition for review argues that the Region failed to support its cost estimates or present information “in a way that can be relied upon in a BACT analysis.” Pet. at 28-32. Calling the Region’s analysis “generic” and “cursory,” *id.* at 28-29, Sierra Club claims that the Region should have included a separate listing and vendor costs for all equipment that would make up the CCS system, as well as “process flow diagrams and design drawings; heat, energy and material balances; type and amount of amine; and temperatures, pressures, flow rates, and specific chemical species in the gas streams to be treated” in order to “make an informed analysis of the CCS control system.” *Id.* at 31. These extraordinary demands should be rejected for several reasons.

First, Sierra Club cites to no statute, regulation, guidance document, or Board opinion requiring such needlessly elaborate, expensive, and time consuming information gathering. Nothing prohibits permitting authorities from relying upon “narrative descriptions” of control technologies or requires them to obtain “site-specific analyses” or “vendor information” for specific components, as Sierra Club alleges. Pet. at 32. In fact, Sierra Club’s arguments run

counter to this Board’s determination that “normally ... very detailed and comprehensive project cost data is not necessary” for such an analysis. *In re Masonite Corp.*, 5 E.A.D. 551, 556 (EAB 1994); *see also* GHG Guidance at 43 (less detailed cost analyses may be appropriate for considerations of CCS in a BACT analysis). These demands are even more unreasonable given that no similar source has ever used CCS at any scale—commercial or otherwise. A.R.V.02 at 15.

Second, the petition for review ignores the extensive data provided in the record on CCS unit components and costs. Contrary to Sierra Club’s claim, ExxonMobil *did* perform a site-specific cost analysis for how CCS would operate at the ethylene production unit, not in some abstract fashion. A.R.I.03 at 22. According to the Region’s response to comments, ExxonMobil’s October 16, 2012 supplemental submission “clearly reflected the design basis and equipment that would be needed to install a CCS system.” *Id.* at 17. This information included component parts, siting, the CCS unit’s anticipated capacity, power requirements, and an explanation of how the CCS system would function. *Id.*; *see also* A.R.I.03 at 18-22. The petition for review, however, simply ignores this record information, failing to acknowledge it, much less “substantively confront the” Region’s response. *In re Peabody W. Coal Co.*, 12 E.A.D. at 33. Without such a response, Sierra Club cannot demonstrate clear error in this case.

CONCLUSION

For the reasons set forth above, permittee ExxonMobil respectfully requests that the petition for review be denied.

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CERTIFICATE OF COMPLIANCE WITH THE WORD LIMIT

Pursuant to NSR Order ¶ 1, I hereby certify that the foregoing Intervenor ExxonMobil Chemical Company's Response to the Petition for Review contains 9,854 words, as calculated using Microsoft Word software.

/s/ James R. Wedeking

CERTIFICATE OF SERVICE

I hereby certify that on the 23rd day of January, 2014, copies of the foregoing Intervenor ExxonMobil Chemical Company's Response to the Petition for Review were served by First Class mail to the following:

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