

IN RE ARIZONA PUBLIC SERVICES COMPANY

PSD Appeal No. 16-01

ORDER DENYING REVIEW

Decided September 1, 2016

Syllabus

Sierra Club petitions the Environmental Appeals Board to review a Clean Air Act prevention of significant deterioration permit that Maricopa County Air Quality Department issued to Arizona Public Service Company in March 2016. The permit authorizes Arizona Public Service to construct five new natural gas-fired combustion turbines at its Ocotillo Power Plant in Tempe, Arizona. Maricopa County issued the final permit pursuant to a delegation agreement between it and the United States Environmental Protection Agency Region 9. Sierra Club claims that Maricopa County clearly erred or abused its discretion in conducting its Best Available Control Technology (“BACT”) analysis for Ocotillo’s projected greenhouse gas emissions when it concluded that pairing energy storage with combustion turbines would “redefine the source.”

Held: The Board denies the petition for review of Maricopa County’s final permit decision.

The Board concludes that the fundamental business purposes and site-specific peaking capacity needs described in the administrative record support the County’s conclusion that adding energy storage options to this facility would redefine the source. The record also supports the County’s determination that Sierra Club’s proposed alternatives would interfere with the project’s inherent design elements, including the ability to start and stop quickly *several times a day*, which are needed to provide fast, flexible, and sustained capacity to meet fluctuating power demands and mitigate grid instability caused by the increasing integration of renewable energy into the electrical system served by the Ocotillo plant. The County’s consideration of energy storage, and its conclusion that the paired stored energy may be exhausted before it can be recharged to meet fluctuating demand, supports the County’s determination that energy storage is not compatible with the purpose and design of a peaking facility, such as the Ocotillo plant, to provide rapid, reliable power to its customers. In making its determination, the County reasonably responded to Sierra Club’s comments on pairing energy storage with the proposed gas turbines. As such, the Board holds that, under the circumstances of this case, Sierra Club fails to demonstrate that Maricopa County clearly erred or abused its discretion in making its BACT determination. The Board further states that this holding should not

be read as an automatic off-ramp for energy storage technology as a consideration in Step 1 in future BACT analyses.

The Board also holds that it will not preclude Sierra Club from seeking review, notwithstanding the fact that Sierra Club did not refile comments during the second draft comment period. Under the particular circumstances of this case, including the fact that Maricopa County considered and responded to Sierra Club's comments and the fact that the issues were adequately and fairly presented on appeal, the Board exercises its discretion to consider Sierra Club's petition on the merits.

Before Environmental Appeals Judges Mary Kay Lynch and Mary Beth Ward.

Opinion of the Board by Judge Lynch:

I. STATEMENT OF THE CASE

The Maricopa County Air Quality Department ("Maricopa County") issued a Clean Air Act Prevention of Significant Deterioration ("PSD") permit to the Arizona Public Service Company. The permit authorizes Arizona Public Service to construct five new natural gas-fired combustion turbines at its Ocotillo Power Plant ("Ocotillo") in Tempe, Arizona. Sierra Club timely filed a petition for review of the PSD permit with the Environmental Appeals Board ("Board"). Both Maricopa County and Arizona Public Service filed responses to the petition. The U.S. Environmental Protection Agency's ("EPA" or "Agency") Region 9 and Office of Air and Radiation filed a brief supporting Maricopa County's permitting decision. The primary issue for review is whether Maricopa County clearly erred or abused its discretion in conducting its Best Available Control Technology ("BACT") analysis and concluding that pairing energy storage with combustion turbines at Ocotillo Power Plant would "redefine the source." For the reasons set forth below, the Board concludes that it did not and denies Sierra Club's petition for review.

II. PRINCIPLES GOVERNING BOARD REVIEW

Section 124.19 of Title 40 of the Code of Federal Regulations governs Board review of a PSD permit. Under part 124, the petitioner bears the burden of demonstrating that review is warranted. *See* 40 C.F.R. § 124.19(a)(4). Ordinarily, the Board will deny review of a permit decision and thus not remand it unless the petitioner demonstrates that the permit decision 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. *Id.* § 124.19(a)(4)(i)(A)-(B); *see, e.g., In re La Paloma Energy Ctr., LLC*, 16 E.A.D. 267, 269 (EAB 2014). The Board's power

to grant review “should be only sparingly exercised,” and “most permit conditions should be finally determined at the [permit issuer’s] level.” Consolidated Permit Regulations, 45 Fed. Reg. 33,290, 33,412 (May 19, 1980); *see also* Revisions to Procedural Rules Applicable in Permit Appeals, 78 Fed. Reg. 5281, 5282 (Jan. 25, 2013).

When evaluating a challenged permit decision for clear error, the Board examines the administrative record that serves as the basis for the permit to determine whether the permit issuer exercised “considered judgment” in issuing the permit. *See, e.g., In re Steel Dynamics, Inc.*, 9 E.A.D. 165, 191, 224-25 (EAB 2000); *In re Ash Grove Cement Co.*, 7 E.A.D. 387, 417-18 (EAB 1997); *see also In re Shell Offshore, Inc.*, 13 E.A.D. 357, 386 (EAB 2007) (permit issuer must articulate with reasonable clarity the reasons supporting its conclusions and the significance of the crucial facts it relied on in reaching its conclusions). In reviewing a permit issuer’s exercise of its discretion, the Board applies an abuse of discretion standard. *See, e.g., In re Guam Waterworks Auth.*, 15 E.A.D. 437, 443 n.7 (EAB 2011). The Board will uphold a permit issuer’s reasonable exercise of discretion if that exercise is cogently explained and supported in the record. *See Ash Grove*, 7 E.A.D. at 397 (“acts of discretion must be adequately explained and justified”); *see also Motor Vehicles Mfrs. Ass’n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 48 (1983) (“[w]e have frequently reiterated that an agency must cogently explain why it has exercised its discretion in a given manner”).

III. OVERVIEW OF PSD AND BACT LEGAL REQUIREMENTS

The PSD provisions of the Clean Air Act (“CAA”) govern air pollution in “attainment” areas, where the air quality meets or is cleaner than EPA’s national ambient air quality standards, and in “unclassifiable” areas that EPA has not categorized as having attainment or nonattainment status. CAA §§ 160-169, 42 U.S.C. §§ 7470-7479; *accord In re Energy Answers Arecibo, LLC*, 16 E.A.D. 294, 306 (EAB 2014). The statutory PSD provisions are largely carried out through a regulatory process that requires new or modified major stationary sources in attainment or unclassifiable areas to obtain a permit prior to construction.¹ *See* CAA § 165, 42 U.S.C. § 7475; 40 C.F.R. § 52.21.

¹ A “major stationary source” is any of a list of specific types of stationary sources that emit, or have the potential to emit, 100 tons per year or more of any pollutant regulated under the new source review program, as defined in 40 C.F.R. § 52.21(b)(50). 40 C.F.R. § 52.21(b)(1)(i). A “major modification” is “any physical change in or change in the

The permitting authority reviews the proposed source prior to construction and must provide notice and an opportunity for interested persons to comment on the air quality impacts of the source, alternatives thereto, control technologies, and other appropriate considerations. CAA § 165(a)(2), 42 U.S.C. § 7475(a)(2). This process is commonly referred to as “new source review” (“NSR”). New major stationary sources and major modifications of such sources are required to employ the “best available control technology” to minimize emissions of regulated pollutants. CAA § 165(a)(4), 42 U.S.C. § 7475(a)(4); 40 C.F.R. § 52.21(j)(2).

The Clean Air Act defines “BACT” as an emission limit that is based on a “case-by-case” analysis of the “maximum degree of reduction of each pollutant subject to regulation * * * from any major emitting facility * * * taking into account energy, environmental, and economic impacts and other costs,” that is “achievable” by employing certain identified processes, techniques, or technologies.² CAA § 169(3), 42 U.S.C. § 7479(3); *accord* 40 C.F.R. § 52.21(b)(12).

As the Board explained in *In re Northern Michigan University*, the BACT definition requires permit issuers to “proceed[] on a case-by-case basis, taking a careful and detailed look, attentive to the technology or methods appropriate for the particular facility, * * * to seek the result tailor-made for that facility and that pollutant.” 14 E.A.D. 283, 291 (EAB 2009) (citations and quotations omitted). BACT is therefore a site-specific determination that results in the selection of an emission limitation representing application of control technologies or methods that are appropriate for the particular facility. *In re Prairie State Generating Co.*, 13 E.A.D. 1, 12 (EAB 2006), *aff’d sub nom. Sierra Club v. EPA*, 499 F.3d 653 (7th Cir. 2007); *In re Three Mountain Power, LLC*, 10 E.A.D. 39, 47 (EAB 2001); *In re Knauf Fiber Glass, GmbH*, 8 E.A.D. 121, 128-29 (EAB 1999).

method of operation of a major stationary source” that would result in: (1) a “significant emissions increase,” as defined in 40 C.F.R. § 52.21(b)(40) and (b)(23), of a regulated pollutant; and (2) a “significant net emissions increase of that pollutant from the major stationary source.” *Id.* § 52.21(b)(2)(i).

² More specifically, BACT represents an emission limit that is achievable for a facility “through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of [the identified] pollutant.” CAA § 169(3), 42 U.S.C. § 7479(3); *accord* 40 C.F.R. § 52.21(b)(12).

EPA guidance on analyzing PSD requirements provides a top-down process for permit issuers to evaluate BACT for any given permit in a consistent and systematic way. *See generally* Office of Air Quality Planning & Standards, U.S. EPA, *New Source Review Workshop Manual* (draft Oct. 1990) (“*NSR Manual*”).³ This top-down process has five steps:

- Step 1: Identify all available control options with potential application to the source and the targeted pollutant;
- Step 2: Analyze the control options’ technical feasibility;
- Step 3: Rank feasible options in order of effectiveness;
- Step 4: Evaluate the energy, environmental, and economic impacts of the options; and
- Step 5: Select a pollutant emission limit achievable by the most effective control option not eliminated in a preceding step.

Id. at B.5-.9; *see Alaska Dep’t of Envtl. Conserv. v. EPA*, 540 U.S. 461, 476 n.7 (2004) (top-down process is “commonly” used by permitting authorities).

EPA also has promulgated permitting guidance for controlling greenhouse gas emissions. *See* Office of Air Quality Planning & Standards, U.S. EPA, Doc. No. EPA-457/B-11-001, *PSD and Title V Permitting Guidance for Greenhouse Gases* (Mar. 2011) (“*GHG Guidance*”). This guidance recommends that BACT analyses for controlling greenhouse gas emissions be conducted in the same manner as for any other regulated pollutant. That is, EPA recommends continuing to apply its preexisting framework for BACT analyses, including the top-down process described in the 1990 NSR Manual. *Id.* at 17.

In Step 1 of the BACT analysis, permit issuers consider the capabilities of add-on air pollution control technologies, inherently lower-emitting processes/practices/designs, and combinations of the two that are potentially available and applicable for use at the proposed facility. *See id.* at 24-25 & n.66;

³ The NSR Manual is not a binding Agency regulation, and consequently strict application of the top-down process described in it is not mandatory nor is it the required vehicle for making BACT determinations. *E.g.*, *N. Mich. Univ.*, 14 E.A.D. at 291-92; *Prairie State*, 13 E.A.D. at 6 n.2; *Knauf*, 8 E.A.D. at 129 n.13. The NSR Manual is, however, considered by this Board to be a statement of the Agency’s thinking on BACT issues. *Steel Dynamics*, 9 E.A.D. at 183 n.22.

NSR Manual at B.10. Add-on controls typically filter and remove pollutants from facility exhaust streams, while inherently lower-emitting processes/practices/designs generate fewer air contaminants in production processes. EPA encourages permit issuers to “cast a wide net” at this stage of the BACT analysis, thereby compiling a “broad array” of potential emissions control options that they can examine more closely in subsequent steps of the analysis. *GHG Guidance* at 26.

But Step 1’s broad look is “not without limits.” *Id.* Consideration of fundamentally different facility types than those proposed by permit applicants generally is not required. Indeed, EPA guidance and Board precedent, affirmed by the U.S. Court of Appeals for the Seventh Circuit, give permitting authorities the discretion to exclude a proposed control alternative from consideration in the BACT analysis, if that proposed alternative would “redefine the design of the source.” *NSR Manual* at B.13; *see Sierra Club v. EPA*, 499 F.3d 653, 654-57 (7th Cir. 2007), *aff’g In re Prairie State Generating Co.*, 13 E.A.D. 1 (EAB 2006); *see also Util. Air Regulatory Group v. EPA*, 134 S. Ct. 2427, 2448 (2014); *In re Sierra Pac. Indus.*, 16 E.A.D. 1, 48-49 (EAB 2013); *In re City of Palmdale*, 15 E.A.D. 700, 729-30 (EAB 2012); *GHG Guidance* at 26-27. If a permitting authority decides that a proposed alternative would constitute a redefinition of the source, it will not list the alternative as a potential control option in Step 1 of its BACT analysis, and it will not consider that option further. *NSR Manual* at B.13.

It is Maricopa County’s “redefining the source” determination for the Ocotillo permit proceeding that is the subject of this appeal.

IV. PROCEDURAL AND FACTUAL HISTORY

In April 2014, Arizona Public Service Company (“APS”) filed an initial application with Maricopa County for permission to construct the “Ocotillo Power Plant Modernization Project” at its existing Ocotillo facility in Tempe, Arizona. *See APS, Title V Operating Permit Revision and PSD Air Pollution Control Permit Application, Ocotillo Power Plant Modernization Project* (Apr. 9, 2014) (Administrative Record Index No. (“A.R.”) A2) (“Init. Appl.”).⁴ Ocotillo is a major stationary air emissions source and the Modernization Project is a major

⁴ Though the various Arizona Public Service permit applications and subsequent Maricopa County-issued permits discussed here and below encompass a broader suite of Clean Air Act provisions than just PSD requirements, this decision addresses only the PSD components of these documents.

modification of the existing facility under the Clean Air Act. Arizona Public Service proposed to replace two 1960s-era steam electric generating units at Ocotillo with five new natural gas-fired simple-cycle combustion turbines, each generating a maximum of 100 megawatts (“MW”) of electricity.

Maricopa County Air Quality Department (“MCAQD”) administers the federal PSD permitting program within Maricopa County, Arizona, pursuant to a delegation agreement with EPA Region 9.⁵ Maricopa County implements the permit requirements in Clean Air Act sections 165 and 504, 42 U.S.C. §§ 7475, 7661c, through Arizona Revised Statutes sections 49-404c and 49-480 and Maricopa County Air Pollution Control Regulations rule 200, section 301.

In October 2014, Sierra Club, represented by Mr. Travis Ritchie, asked to be placed on Maricopa County’s service list for the Ocotillo permit. E-mail from Travis Ritchie, Counsel, Sierra Club, to Henry Krautter, Permit Eng’r, MCAQD (Oct. 22, 2014) (A.R. E1). The engineer assigned to Arizona Public Service’s permit responded by stating that he would “keep [Mr. Ritchie] updated.” E-mail from Henry Krautter, Permit Eng’r, MCAQD, to Travis Ritchie, Counsel, Sierra Club (Oct. 22, 2014) (A.R. E1). A month later, in response to an e-mailed invitation from the engineer, Mr. Ritchie provided informal comments on the greenhouse gas BACT analysis for the proposed combustion turbines. *See* A.R. E1. Arizona Public Service submitted an updated permit application in January 2015. *See* APS, *Title V Operating Permit Revision and PSD Air Pollution Control Permit Application, Ocotillo Power Plant Modernization Project* (Jan. 23, 2015) (A.R. A5) (“First Updated Appl.”).

In both the initial and first updated applications, Arizona Public Service identified the Ocotillo Modernization Project’s fundamental business purpose as

⁵ *See* U.S. EPA Region 9 & MCAQD, *Agreement for Delegation of the Federal Prevention of Significant Deterioration (PSD) Program Set Forth in 40 C.F.R. 52.21* (Feb. 8, 2016) (“Delegation Agreement”). In accordance with the delegation agreement and applicable regulations, Maricopa County-issued PSD permit decisions are considered to be federally issued PSD permit decisions. *See* 40 C.F.R. § 124.41 (the terms “EPA” and “Regional Administrator” mean the delegate agency and its head, respectively, when an agency exercises delegated authority to administer the PSD permit program); 45 Fed. Reg. 33,290, 33,413 (1980) (“For the purposes of Part 124, a delegate [state or local agency] stands in the shoes of the Regional Administrator. Like the Regional Administrator, the delegate must follow the procedural requirements of part 124. * * * A permit issued by a delegate is still an ‘EPA-issued permit.’”).

that of a “peaking power plant” that can “start and stop quickly several times a day to meet rapidly changing electric demand requirements,” “change load quickly,” and “idle at low load.” Init. Appl. at 2 & app. B §§ 6.1, 6.3, at 31-32, 35 (emphasis in original); First Updated Appl. at 2 & app. B §§ 6.1, 6.3, at 32-33, 36 (same). The applicant explained that renewable energy sources, particularly solar, are an ever-increasing component of its electric power grid, but such sources produce electricity intermittently. Arizona Public Service therefore expressed a need for other energy generation forms that can be “quickly and reliably dispatched” when solar energy is unavailable, to bridge production gaps and maintain reliable electric service at all times. Arizona Public Service also explained that customers use varying amounts of energy throughout the day, creating “multiple times of peak demand” over each twenty-four hour period. Together, these factors create a need for a facility that has “quick start and power escalation capability” to handle multiple daily peak power demands while also mitigating grid instabilities caused by intermittent renewable energy production. Init. Appl. at 2 & app. B § 6.1, at 31-32; First Updated Appl. at 2 & app. B § 6.1, at 32-33.

In March 2015, Maricopa County issued and invited public comment on a draft PSD permit to regulate emissions from the proposed combustion turbines, along with a draft “Technical Support Document” containing technical information on the permit.⁶ See MCAQD, *Draft Title V Air Quality Operating Permit, Ocotillo Power Plant Modernization Project* (Mar. 4, 2015) (A.R. R1) (“Draft Permit”); MCAQD, *Draft Technical Support Document, Ocotillo Power Plant* (Mar. 4, 2015) (A.R. R2). On April 9, 2015, Sierra Club, represented by Mr. Ritchie, submitted comments on the draft permit. See generally Letter from Travis Ritchie, Assoc. Att’y, Sierra Club, to Henry Krautter, Permit Eng’r, MCAQD (Apr. 9, 2015) (A.R. F6) (“Sierra Club Comments”).

Among many other things, Sierra Club commented that Maricopa County’s greenhouse gas BACT analysis was deficient because it did not consider the use of various energy storage technologies – such as battery storage, compressed air storage, or liquid air energy storage – as add-on or lower-emitting control options for reducing Ocotillo’s greenhouse gas emissions. *Id.* at 3-9. Sierra Club asserted that Arizona Public Service’s project purpose could be served by replacing some or all of the proposed combustion turbines with energy storage. *Id.* at 4. In discussing these alternatives, Sierra Club identified both replacement and pairing energy

⁶ The TSD is equivalent to the “statement of basis” required by 40 C.F.R. § 124.7. See Delegation Agreement ¶ V.3, at 6.

storage options with other technologies, including the project's turbines. *See id.* at 4-15. Sierra Club claimed that “[i]nterfacing energy storage with gas turbines would eliminate the need to operate the [proposed] turbines at low loads,” which purportedly would improve Ocotillo's efficiency and reduce its greenhouse gas and other criteria pollutant emissions. *Id.* at 6.

Maricopa County responded in part to Sierra Club's public comments by contacting Arizona Public Service and requesting more detailed information on the greenhouse gas BACT analysis and other matters. *See* Letter from Richard A. Sumner, Permitting Div. Mgr., MCAQD, to Anne Carlton, Env'tl. Consultant, APS (Apr. 29, 2015) (A.R. D1). In turn, Arizona Public Service submitted more detailed explanations of its consideration of energy storage, including battery storage and other subjects. *See* Letter from Charles Spell, Env'tl. Dir., APS, to Richard A. Sumner, Permitting Div. Mgr., MCAQD (June 26, 2015) (A.R. D2). Consistent with the delegation agreement, Maricopa County conveyed this and other information to EPA Region 9 during the permit development process. *See, e.g.*, A.R. C5, F1; *see also* Delegation Agreement ¶ V, at 5-7. Arizona Public Service subsequently shared with Maricopa County its draft of a response to Sierra Club's comments and a revised BACT analysis for greenhouse gas emissions, and Maricopa County transmitted these documents to Mr. Ritchie for Sierra Club review. *See* A.R. A6, E3.

Arizona Public Service followed up on September 30, 2015, by submitting a revised permit application that consolidated its prior updates. *See* APS, *Title V Operating Permit Revision and PSD Air Pollution Control Permit Application, Ocotillo Power Plant Modernization Project* (Sept. 30, 2015) (A.R. A8) (“Rev'd Appl.”). Among other things, the revised permit application included an updated BACT analysis and discussion of energy storage, including battery storage, as options. *See id.* app. B § 7.4.4, at 48-50. The application described the purpose of the proposed project as a peaking and load shaping power plant, capable of quickly starting/escalating and stopping energy generation multiple times daily to meet rapidly changing electricity demands. Arizona Public Service identified an electric power ramp rate of 50 MW per minute per turbine as “critical for the project to meet its purpose,” because that rate would allow all five turbines operating together at 25% load to provide approximately 375 MW of ramping capacity (from 125 to 500 MW) in less than 2 minutes. *See id.* § 2.2, at 12 & app. B §§ 2, 7.1, at 13, 38.

On November 9, 2015, in response to Mr. Ritchie's request for an update of the permit status, Maricopa County advised him that it anticipated issuing a revised permit for public comment in mid-December 2015. *See* A.R. E4.

On December 16, 2015, Maricopa County posted a revised draft permit and notice of public comment opportunity on its website and published notice of the same in public newspapers. *See* MCAQD, *Revised Draft PSD, NSR, and Title V Air Quality Construction and Operating Permit, Ocotillo Power Plant Modernization Project* (Dec. 16, 2015) (A.R. R3) (“Rev’d Draft Permit”); A.R. K10, at 12-19; MCAQD Surreply at 5-6. A few days earlier, on December 11, 2015, Maricopa County had sent a mass electronic mail notice to a list of persons that the County states included “those who had requested notification of draft PSD permits” and that the County had obtained from EPA Region 9. MCAQD Surreply at 6. That notice informed recipients that a public comment period would be held on the revised draft permit beginning December 16, 2015, and extending through January 22, 2016. *See* E-mail from Rachel Danley, Admin. Operations Specialist, MCAQD, to Ocotillo Permit Notification List (Dec. 11, 2015) (A.R. K9) (“Mass E-mail Notice”). Mr. Ritchie was not included on that mass e-mail. The e-mail addresses of two other Sierra Club employees or former employees were included, one of which Maricopa County acknowledges “may have been undeliverable.” MCAQD Resp. at 11. The one other commenter on the March 4, 2015 draft permit similarly appears to have been omitted from the e-mail notice.

According to Maricopa County, the December 2015 revised draft permit and technical support document incorporated changes made to address Sierra Club and other public comments. These changes included a lower BACT limit for combustion turbine greenhouse gas emissions (reduced from 1,690 to 1,460 pounds carbon dioxide per megawatt-hour) and other matters. *Compare* Draft Permit § 18(b) tbl.4, at 17, *with* Rev’d Draft Permit § 18(b) tbl.4, at 16. Maricopa County held a public hearing on January 16, 2016, but neither of the former commenters attended, and the County ultimately received no comments on the revised draft permit.

In March 2016, Maricopa County issued the final permit, which remained unchanged from the revised draft permit and authorized Arizona Public Service to construct and operate the Ocotillo Power Plant Modernization Project. *See* A.R. R5 (“Final Permit”). Maricopa County also issued a final Technical Support Document to accompany the final permit. *See* A.R. R6 (“Final TSD”). Maricopa County sent separate e-mails conveying cover letters and the response to comments document to Sierra Club and the other commenter on the first draft permit. *See* A.R. F9, F10 (“Response to Comments” or “RTC”).

This petition for review followed.

V. ANALYSIS

Sierra Club's petition raises one primary issue: whether Maricopa County clearly erred or abused its discretion when it eliminated the pairing of energy storage with combustion turbines in its BACT analysis based on the County's conclusion that the option would "redefine the source." Pet. at 2, 12, 17-25. As part of its argument, Sierra Club also questions whether Maricopa County clearly erred in its response to Sierra Club's comments on pairing energy storage with the proposed turbines. *Id.* at 29-34. Maricopa County and Arizona Public Service defend the BACT analysis and response to comments, and also argue that Sierra Club failed to preserve the issues it raises on appeal because it did not comment on the revised draft permit. MCAQD Resp. at 27-30; APS Resp. at 8-13. In reply, Sierra Club argues that it should not be precluded from seeking review of the final permit because Sierra Club was not required to refile comments, Maricopa County had an opportunity to consider its comments, and Maricopa County failed to adequately notify Sierra Club that a second comment period had been opened. Reply at 1-3, 6-9.

For reasons explained below, the Board concludes that the record taken as a whole supports Maricopa County's decision to eliminate the potential emissions control option of energy storage paired with combustion turbines in the greenhouse gas BACT analysis for Ocotillo. Before turning to the substantive issue in this matter, however, the Board addresses the question of whether Sierra Club should be precluded from seeking review.

A. *Sierra Club Is Not Precluded from Seeking Review*

Part 124 requires that a petitioner demonstrate that any issues and arguments it raises on appeal were raised during the public comment period to the extent that those issues and arguments were reasonably available at that time. 40 C.F.R. § 124.19(a)(4)(ii); *see also id.* § 124.13 (establishing requirements to raise issues and provide information during the public comment period). Board precedent is clear that comments submitted outside a public comment period, either before or after, do not suffice. *See In re City of Phoenix*, 9 E.A.D. 515, 524-31 (EAB 2000) (comments on a permit provided *before* the public comment period are insufficient to properly preserve issues for review); *In re New England Plating Co.*, 9 E.A.D. 726, 734 n.18 (EAB 2001) (same); *In re Kawaihae Cogeneration Project*, 7 E.A.D. 107, 120 (EAB 1997) (same); *see also In re City of Taunton*, 17 E.A.D. 105, 122 (EAB 2016) (permitting authority is under no obligation to consider comments submitted *after* the public comment period has closed).

In addition to establishing the public's obligation to raise issues during the public comment period, the regulations governing this appeal also prescribe the permitting authority's obligations when reopening a public comment period. *See* 40 C.F.R. § 124.14. To facilitate the public review process, applicable regulations set forth procedures for notifying the public of draft permits and public comment periods, which extend to both the content and manner of notification and apply to both initial and reopened comment periods.⁷ *Id.* (providing requirements for notifying the public when a comment period is reopened and requiring public notice to be issued under section 124.10); *id.* § 124.10 (providing requirements for public notice of permit actions and public comment periods); *see In re Russell City Energy Ctr.*, 14 E.A.D. 159, 177-78 (EAB 2008) (remanding where permitting authority failed to properly provide notice of a draft permit).

In this case, the record is unclear whether Maricopa County complied with notification requirements for the revised draft permit – when it did not directly notify counsel for Sierra Club, Travis Ritchie, as counsel had specifically requested – or whether Maricopa County otherwise met part 124 procedural obligations when it opened the second comment period. And nothing in Maricopa County's revised draft permit notice advised prior commenters that new comments had to be filed during the second comment period to be considered for the final permit or to preserve the issues for appeal. *See* Mass E-Mail Notice; A.R. K10, at 12-19. Ultimately, Maricopa County did consider and respond to Sierra Club's comments on the first draft permit when the County issued the final permit in March 2016, and these issues were adequately and fairly presented to the Board on appeal. Under the particular circumstances of this case and the record before it, the Board will not preclude Sierra Club from seeking review, but instead will exercise its discretion to consider Sierra Club's petition on the merits.⁸

⁷ Arizona Public Service is mistaken when it asserts that no such regulatory requirement for notice exists; its reliance on *Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc.*, 435 U.S. 519, 538 (1978), is inapposite.

⁸ Given the issues raised in this appeal, the Board also believes it would be prudent for Maricopa County to establish a clear and consistent system to implement the requirements for maintaining mailing lists and notifying persons on the list under 40 C.F.R. § 124.10(c)(1)(ix)(A), and otherwise complying with the requirements for reopening the comment period under 40 C.F.R. § 124.14.

B. *Maricopa County Did Not Abuse Its Discretion When It Determined That Pairing Energy Storage at This Facility Would “Redefine the Source”*

As noted above, Sierra Club challenges Maricopa County’s conclusion that pairing energy storage with the proposed combustion turbines would “redefine the source” and Maricopa County’s elimination, on that basis, of that option from Step 1 of its BACT analysis. The Board reviews permit issuers’ determinations that potential emissions control options would “redefine the source” under an abuse of discretion standard. *In re La Paloma Energy Ctr., LLC*, 16 E.A.D. 267, 285 (EAB 2014); *In re Russell City Energy Ctr., LLC*, 15 E.A.D. 1, 72-75 (EAB 2010), *pet. denied sub nom. Chabot-Las Positas Cmty. Coll. Dist. v. EPA*, 482 F. App’x. 219 (9th Cir. 2012); *In re Desert Rock Energy Co.*, 14 E.A.D. 484, 524-39 (EAB 2009).

When evaluating the merits of technical or scientific disputes, the Board typically defers to permit issuers’ specialized expertise in such areas. *E.g.*, *In re Newmont Nev. Energy Investment*, 12 E.A.D. 429, 444-48 (EAB 2005); *In re BP Cherry Point*, 12 E.A.D. 209, 227 (EAB 2005). In cases where the permit issuer exercises delegated federal authority, the Board regards as significant the views of EPA’s program offices. *E.g.*, *In re Steel Dynamics, Inc.*, 9 E.A.D. 165, 170 (EAB 2000) (“EPA’s views on technical issues also carry significant weight”). Finally, the Board has consistently recognized the principles set forth in the NSR Manual as statements of the Agency’s thinking on BACT issues. *See supra* note 3; *see also Steel Dynamics*, 9 E.A.D. at 183 n.22.

1. *“Redefining the Source” – Legal Principles*

As explained in Part III, above, Step 1 of the BACT analysis does not require consideration of facility types that are fundamentally different from those proposed by permit applicants. *NSR Manual* at B.13; *GHG Guidance* at 26. Indeed, EPA guidance and Board precedent, affirmed by the Seventh Circuit, give permitting authorities the discretion to exclude a proposed control alternative from consideration in the BACT analysis, if that proposed alternative would “redefine the design of the source.” *NSR Manual* at B.13; *see Sierra Club v. EPA*, 499 F.3d 653, 654-57 (7th Cir. 2007), *aff’g In re Prairie State Generating Co.*, 13 E.A.D. 1 (EAB 2006); *see also Util. Air Regulatory Group v. EPA*, 134 S. Ct. 2427, 2448 (2014); *In re Sierra Pac. Indus.*, 16 E.A.D. 1, 48-49 (EAB 2013); *In re City of Palmdale*, 15 E.A.D. 700, 729-30 (EAB 2012); *GHG Guidance* at 26-27. If a permitting authority decides that a proposed alternative would constitute a redefinition of the source, it will not list the alternative as a potential control option in Step 1 of its BACT analysis, and it will not consider that option further. *NSR Manual* at B.13.

Although the greenhouse gas guidance states the Agency's general view that a wholesale change of a facility's primary fuel would in most cases be "redefining the source," and thus is not required to be a considered option, *GHG Guidance* at 27-28, that guidance does not specifically address the question whether a *partial* switch or *augmentation* of an applicant's power source or proposed fuel would generally be viewed as a redefinition of the source. The Board, however, in *La Paloma*, concluded that adding a solar thermal energy component to a natural gas-fired combustion turbine project would have improperly redefined the source in that particular case, given the business purpose, space limitations, and specific design requirements of the proposed project. See *La Paloma*, 16 E.A.D. at 288-92.

As explained in *La Paloma*, to determine whether an emissions control option would fundamentally redefine a proposed source, permit issuers should begin by examining how the permit applicant defines the proposed facility's "end, object, aim, or purpose," i.e., its "basic design." That "basic design" typically is set forth in the permit application and supporting materials in the administrative record. *Id.* at 286; *accord Palmdale*, 15 E.A.D. at 731; *Desert Rock*, 14 E.A.D. at 530; *Prairie State*, 13 E.A.D. at 21-23. The permit issuer should then take a "hard look" at the applicant's "basic design," identifying design elements that are "inherent" to the applicant's purpose and design elements that possibly could be altered to achieve pollutant emissions reductions without disrupting that purpose. See, e.g., *Sierra Pac.*, 16 E.A.D. at 48; *Palmdale*, 15 E.A.D. at 731; *Desert Rock*, 14 E.A.D. at 530; *Prairie State*, 13 E.A.D. at 27; *In re Knauf Fiber Glass, GmbH*, 8 E.A.D. 121, 136-44 (EAB 1999). In taking this hard look, the permit issuer must ensure that the proposed facility's design has been "derived for reasons independent of air quality permitting." *Prairie State*, 13 E.A.D. at 26; *accord Russell City*, 15 E.A.D. at 73; *Desert Rock*, 14 E.A.D. at 530. As the Board has recognized, a permitting authority's "hard look" may appropriately consider different designs, such as a base load versus a peaking design, as central to the fundamental business purposes of different generating units. *Prairie State*, 13 E.A.D. at 25; see also *GHG Guidance* at 27.

Each such determination, like each BACT analysis itself, requires a case-by-case analysis and is highly fact- and circumstance-specific. *La Paloma*, 16 E.A.D. at 287 (citing CAA § 169(3), 42 U.S.C. § 7479(3)) (defining "BACT" as a "case-by-case" determination); *GHG Guidance* at 26. Permit issuers generally have broad discretion in conducting BACT determinations, but they are strongly discouraged from categorizing emissions control options as "impermissible redesign" without first taking the requisite "hard look" at the project. To skip this step might result in their "paving an automatic BACT off-ramp" that "frustrates

congressional will” and may constitute a reversible abuse of discretion. *In re N. Mich. Univ.*, 14 E.A.D. 283, 302(EAB 2009); *accord La Paloma*, 16 E.A.D. at 287. Accordingly, previous permitting decisions for similar sources are instructive but not controlling, and prior determinations that particular emissions control options redefine proposed sources are not necessarily relevant in subsequent analyses of unrelated projects. *Desert Rock*, 14 E.A.D. at 521, 534-35 & n.73.

With these fundamental concepts in mind, the Board examines the stated purpose of the Ocotillo project and whether Maricopa County took a “hard look” at whether pairing energy storage with the proposed turbines would disrupt that purpose.

2. *The Basic Business Purpose of the Ocotillo Modernization Project*

All parties in this appeal agree that the Ocotillo project’s basic business purpose is that of a peaking facility, needed “to provide peaking and load shaping electric capacity in the range of 25 to 500 MW (including quick ramping capability to backup renewable power and other * * * energy sources).” Pet. at 14 (quoting Rev’d Appl. § 2.2, at 12 & app. B ch. 2, at 13); *see* MCAQD Resp. at 6, 31, 38; APS Resp. at 2-3, 39; *see also* EPA Br. at 4, 9. All parties also agree that the project design “requires quick start and power escalation capability to meet changing power demands and mitigate grid instability caused by the intermittency of renewable energy generation.” Pet. at 15; *see* MCAQD Resp. at 6, 8-9, 31, 38; APS Resp. at 3-4, 16-17. The parties disagree, however, on whether the project’s stated need to provide “375 MW of ramping capacity (i.e., from 125 to 500 MW) in less than 2 minutes” is actually a fundamental or inherent component of the project’s design. Pet. at 16 (quoting Rev’d Appl. § 2.2, at 12 & app. B ch. 2, at 13). Sierra Club contends that the combustion turbines can achieve full load from a “black start” (i.e., ramping from 0 to 500 MW) in 10 minutes. Pet. at 16. In so arguing, Sierra Club does not mention the approximately 20 additional minutes needed for the turbines to attain full functionality of their emissions control equipment. *See infra* Part V.B.3.

Arizona Public Service’s initial PSD application submitted in April 2014, and its first updated application submitted in January 2015, contain the earliest descriptions of the applicant’s “basic business purpose” for Ocotillo. In these applications, Arizona Public Service described Ocotillo’s purpose as “to provide peak power capacity,” with the ability to “start and stop quickly several times a day to meet rapidly changing electric demand requirements.” Init. Appl. app. B § 6.3, at 35; First Updated Appl. app. B § 6.3, at 36. Arizona Public Service indicated that the proposed simple-cycle gas turbines “have the quick start and power

escalation capability that is necessary to meet changing power demands and mitigate grid instability caused by the intermittency of renewable energy generation. The new units need the ability to start quickly, change load quickly, and idle at low load.” Init. Appl. at 2 & app. B § 6.1, at 31-32; First Updated Appl. at 2 & app. B § 6.1, at 32-33. The applications further explained:

This capability is * * * absolutely necessary to integrate with and fully realize the benefits of * * * solar power and other renewable resources. *To achieve these requirements, these [proposed simple-cycle gas turbines] will be designed to meet the proposed air emission limits at steady state loads as low as 25% of the maximum output capability of the turbines.*

Init. Appl. at 2 & app. B § 6.1, at 31-32 (emphasis added); First Updated Appl. at 2 & app. B § 6.1, at 32-33 (same).

In the BACT Step 1 analyses in these documents, Arizona Public Service concluded that electric power generating technologies other than simple-cycle gas turbines – such as, for example, reciprocating internal combustion engines or combined-cycle combustion turbines – would “change the project in such a fundamental way that the requirement to use these technologies would effectively redefine the Project.” Init. Appl. app. B § 6.3, at 35; First Updated Appl. app. B § 6.3, at 36. Arizona Public Service noted that reciprocating engines are small and thus at least twenty-eight such units would be required to provide 500 MW of power, adding operational complexity and possibly not physically fitting onto the plant site. Combined-cycle turbines similarly “would change the project in such a fundamental way that the plant could not meet its fundamental purpose of a peaking power plant,” because those units “may require more than 3 hours to achieve full load, as compared to approximately 10 minutes to achieve the full rated electric output for the proposed * * * simple-cycle gas turbines.” Init. Appl. app. B § 6.3, at 35; First Updated Appl. app. B § 6.3, at 36.

In the revised permit application submitted on September 30, 2015, Arizona Public Service reiterated that the project’s purpose is “to provide peaking and load shaping electric capacity in the range of 25 to 500 MW (including quick ramping capability to backup renewable power * * *).” Rev’d Appl. § 2.2, at 12 & app. B ch. 2, at 13. Arizona Public Service stated that it would continue to add renewable energy, particularly solar, to its electric power grid, with the goal of complying with Arizona’s mandate that 15% of total generating capacity be comprised of such sources by 2025. *Id.* After explaining again that one of the major impediments to integrating renewable energy is the intermittent nature of the power provided, Arizona Public Service observed:

Considering the solar capacity in Maricopa County, the *** electric generating capacity ramp rate required to back up these types of solar systems *** range[s] from 165 to 310 MW per minute. The actual renewable energy load swings experienced on the APS system have also shown rapid load changes from renewable energy sources of 25 to 300 MW in very short time periods [i.e., approximately one-minute to one-hour intervals] ***.

Id.

To meet these design needs and comply with the proposed BACT air emission limits at loads ranging from 25% to 100% of the turbines' maximum output capability, Arizona Public Service identified five gas-fired simple-cycle combustion turbine generators that can "provide an electric power ramp rate equal to 50 MW per minute per [turbine,] which is critical for the project to meet its purpose." *Id.* Arizona Public Service further explained that "[w]hen all 5 proposed [turbines] are operating at 25% load, the entire project can provide approximately 375 MW of ramping capacity (i.e., from 125 to 500 MW) in less than 2 minutes." *Id.*; *see also id.* app. B § 7.4.3, at 47-48. As Arizona Public Service explained, normal starts, ramping from shutdown status at 0 MW to full generating capacity at 100 MW per turbine, take about 10 minutes at an average 10 MW escalation per minute, but emissions control units take another 20 minutes or so to become fully operational, causing the entire normal start-up time to be around 30 minutes. *See Rev'd Appl.* app. B ch. 8, at 68-69.

Given the project's identified business purpose, the Board next examines whether Maricopa County took a "hard look" at whether pairing energy storage with the proposed project design would disrupt that purpose.

3. *Maricopa County's Elimination of Energy Storage and "Hard Look" in Its BACT Step 1 Analysis*

Maricopa County considered the information, summarized above, that Arizona Public Service submitted in its various permit applications for the Ocotillo Modernization Project. *See, e.g.,* RTC at 4-13; Final TSD §§ 3-4, 27-28, at 5-7, 32-41. Based on that information, Maricopa County characterized the Ocotillo project as a simple-cycle natural gas-fired peaking facility "designed to back up renewable generation," RTC at 5, whose "purpose" is "to provide reliable, rapidly dispatchable power to support renewables and the transmission grid," *id.* at 6, and whose "site-specific purpose and need" is "to provide up to 500 MW of peak electric generating capacity for potentially extended periods of time," *id.* at 8.

In analyzing the applicant's information about its proposed facility, Maricopa County determined that incorporating energy storage into the Ocotillo facility design would not meet Arizona Public Service's basic business purpose but rather would "fundamentally redefine the source." *Id.* at 6. Maricopa County reasoned as follows:

APS, in order to assure reliability, must build a system that can meet not only a short peak demand, but also several short peak demands in a row, an extended peak demand, or even several extended peak demands. If the utility is reliant upon stored energy for some or all of its peaking power, be it battery * * * or other storage technologies, at some point the stored energy may run out before it can be recharged, making the solution unreliable for meeting the full demand. Accordingly, energy storage is not compatible with the purpose and design of a true peaking facility such as the Project to provide rapid, reliable power.

Id. at 8.⁹ Maricopa County therefore eliminated energy storage as a possible emissions control option for Ocotillo.

Sierra Club objects to Maricopa County's analysis, claiming, among other things, that neither Arizona Public Service nor Maricopa County explained what "business need or end goal" is achieved by idling all five combustion turbines at 25 MW loads. *Pet.* at 15. According to Sierra Club, idling at low load "is an operational description, not a project need description." *Id.* at 15-16. The record, however, is to the contrary. Both Arizona Public Service's and Maricopa County's descriptions of the project's basic purpose explain the need for quick start and quick ramp-up capabilities, along with potentially multiple exercises of these capabilities on the same day, to achieve maximum energy generation of 500 MW. Without the rapid power escalation rate afforded in part by beginning from low-load idle, maximum production of 500 MW within 2 minutes would not be achieved.

Indeed, as explained in the record, normal (cold) starts, ramping from 0 to 100 MW per turbine, take about 10 minutes at an average 10 MW escalation per minute, but emissions control units take another 20 minutes or so to become fully operational, causing the entire normal start-up time to take approximately

⁹ Maricopa County stated that it also would reject battery storage at Step 2 of the greenhouse gas BACT analysis. *RTC* at 8-9; *see Rev'd Appl. app. B* § 7.4.4, at 48-49; *Final TSD* § 28, at 39 & *app. A* § 7.4.4.1, at 49 (noting that "it is not technically feasible at this time to produce up to 500 MW of electrical energy" using battery storage).

30 minutes. *See* Final TSD §§ 13, 28 & tbl.10, at 12-13, 15, 42; *see also* Init. Appl. § 3.1.2, at 18 & app. B § 6.4.2, tbl.B6-2, & ch. 7, at 33, 38, 50-51; First Updated Appl. app. B ch. 7, at 51-52; Rev'd Appl. app. B ch. 8, at 68-69. Quick starts, by contrast, which occur when the turbines are already warm and stable, take less than 2 minutes, as each turbine ramps from low idle at 25 MW to maximum capacity at 100 MW, a 75-MW increase that occurs at the maximum ramp rate of 50 MW per minute. *See* Final TSD § 4, at 6-7; Rev'd Appl. at 12 & app. B ch. 2 & §§ 7.1, 7.4.3, 7.5.2.3, at 13, 38, 47, 53.

According to Arizona Public Service, the purpose of idling the combustion turbines at 25% maximum load is to enable them to achieve their maximum capacity of 100 MW in under 2 minutes. APS Resp. at 35 (citing RTC at 12). This business need is supported by Arizona Public Service's earliest permit applications, which explain that "customers use energy in different ways and at different times," creating "multiple times of peak demand throughout the day." Init. Appl. at 2 & app. B § 6.1, at 32; First Updated Appl. at 2 & app. B § 6.1, at 33. To handle these multiple peak demands within the context of a fossil fuel/intermittent renewable energy supply network, Arizona Public Service explicitly sought – *as part of its project design* – turbines that could "startup and shutdown multiple times a day," so that the Ocotillo plant could offer a "quick response to changes in the supply and demand of electricity." Init. Appl. app. B § 6.4.2.3, at 38; First Updated Appl. app. B § 6.4.2.3, at 39. Similarly, Arizona Public Service sought to identify BACT options that would fulfill Ocotillo's "fundamental purpose" as a "peaking power plant" that "provide[s] peak power capacity which must be able to start and stop quickly several times a day to meet rapidly changing electric demand requirements." Init. Appl. app. B § 6.3, at 35; First Updated Appl. app. B § 6.3, at 36; *accord* Rev'd Appl. §§ 2.2, 7.1, at 12, 38.

The administrative record in this case supports Maricopa County's conclusion that integrating energy storage into the Ocotillo project would interfere with Arizona Public Service's ability to meet its customers' needs for "rapid, reliable power," as that option likely would not allow Arizona Public Service to meet "short peak demand[s]," "several short peak demands in a row," or "extended peak demand[s]" on an "immediate basis." *See* RTC at 8-9. For example, Sierra Club concedes on appeal that the paired energy storage option it advocates would not allow Arizona Public Service to fire the turbines to maximum capacity in 2 minutes. Pet. at 16 & n.12. As such, the option would not fulfill Arizona Public Service's project purpose. Maricopa County reasonably determined that energy storage would not be adequate to stabilize the electrical grid, as necessary in a situation with a large and growing proportion of intermittent power sources such as solar and wind. *See* RTC at 11-12. The record supports a determination that these

aspects of the facility's design are inherent ones, central to Arizona Public Service's business purpose in proposing the Ocotillo Modernization Project, and Maricopa County appropriately identified them as such. *Id.* at 8-9, 11-12.

The record also supports that Maricopa County appropriately concluded that a coal-fired power plant in Chile, called the Angamos Power Plant, which Sierra Club had mentioned in its comments as an example of energy storage's technical feasibility, *see* Sierra Club Comments at 6 & ex. 3, is insufficiently similar to Arizona Public Service's project to warrant consideration as BACT. First, the Angamos plant is a base load facility rather than a peaking facility, which means that once it starts up, it produces energy continually. The purpose and design of such a plant are different than the purpose and design of a peaking facility, which starts up and shuts down repeatedly and requires a high degree of operational flexibility. *See, e.g., Prairie State*, 13 E.A.D. at 25 (acknowledging distinction between design of and emissions control equipment used in base load facilities versus peaking facilities). Second, Angamos employs a 20-MW lithium-ion battery energy storage system to provide fifteen minutes of "grid spinning reserve," which is unused generation capacity the Chilean government requires power plants to maintain in the event of emergencies. *See* MCAQD Resp. at 39-40; APS Resp. at 22-23. Accordingly, as Arizona Public Service points out, by having batteries available to meet this spinning reserve requirement, the facility can use more of its coal-fired generating capacity that would otherwise have been kept in reserve for emergencies, effectively increasing the plant's maximum capacity and emissions rather than decreasing them. APS Resp. at 23. These differences appear significant enough to support Maricopa County's determination that it need not consider applying Angamos-type battery storage technology to Ocotillo's facility.

Having reviewed the administrative record and Maricopa County's analysis, the Board concludes that the information in the record is sufficient to support, as an inherent design element, the need to provide immediate and highly flexible ramping capability of 50 MW per minute that enables full energy production in less than 2 minutes to meet several peak demands per day and a sustained demand as needed. Indeed, as far back as the initial and first updated permit applications, Arizona Public Service discussed the facility's need to have "quick start and power escalation capability that is necessary to meet changing power demands and mitigate grid instability caused by the intermittency of renewable energy generation." Init. Appl. at 2 & app. B § 6.1, at 32; First Updated Appl. at 2 & app. B § 6.1, at 33. Arizona Public Service reiterated this fundamental business purpose in the later revised permit application. *See* Rev'd Appl. §§ 2.2, 7.1, at 12, 38. Maricopa County took a hard look at the project, sufficiently

considering all of these factors in its permit analysis, and thus the Board finds no basis for remanding the permit on this ground.

4. *Maricopa County Was Not Required to Independently Investigate Alternative Configurations*

On appeal, Sierra Club presents a more detailed explanation of several possible configurations for paired energy storage at Ocotillo that it believes could satisfactorily achieve Arizona Public Service's project purpose. For example, Sierra Club suggests that Arizona Public Service could employ a 25- to 50-MW energy storage system, such as a battery or batteries, to support one or all of the five simple-cycle combustion turbines, allowing those turbines to shut down completely rather than idle and fire up when needed over a battery-powered generation bridge. *See* Pet. at 13 & nn.9-10. As noted above, these scenarios would require an approximate 10-minute startup period for the combustion turbines to reach full power and another 20 minutes to achieve full emissions control capability.

The Board is not persuaded that Maricopa County clearly erred or abused its discretion by not conducting detailed investigations of these technology options. Sierra Club's suggestion on appeal that differently sized batteries and pairing configurations should be considered in the BACT analysis, Pet. at 13 & nn.9-10, essentially asks the Board to find that Maricopa County should be required to engage in an independent analysis of alternatives to Arizona Public Service's proposed project. Board case law has made it clear, however, that permit issuers are not required to conduct independent alternatives analyses when issuing PSD permits. *See, e.g., In re Prairie State Generating Co.*, 13 E.A.D. 1, 30 (EAB 2006) (distinguishing permit issuer responsibilities under nonattainment provisions of Clean Air Act, which do require alternatives analyses, and PSD provisions, which do not), *aff'd sub nom. Sierra Club v. EPA*, 499 F.3d 653 (7th Cir. 2007). In any event, Sierra Club has not demonstrated that the paired battery configurations it advocates have the capability to support Ocotillo in achieving the repeated quick starts that may need to occur on a single day for Arizona Public Service to reliably fulfill market demand. *See* Pet. at 13 (suggesting that battery recharging may occur during periods of over-generation or when turbines are not operating at full loads, without acknowledging that this is not compatible with the need to flexibly respond to peak demands and to start and stop quickly several times a day). Sierra Club also does not address the issue of the paired energy storage being exhausted before it can be recharged to meet fluctuating demand.

5. *Maricopa County Adequately Responded to Sierra Club's Comments*

Sierra Club also argues that Maricopa County's response to comments document failed to adequately consider energy storage *paired* with the combustion turbines (as opposed to the wholesale replacement of the gas combustion turbines with energy storage). Pet. at 31 (arguing that Maricopa County's failure to consider paired energy storage was clear error; citing *In re Russell City Energy Ctr., LLC*, 15 E.A.D. 1, 24 (EAB 2010) (quoting and discussing 40 C.F.R. § 124.17(a)(2)), *pet. denied sub nom. Chabot-Las Positas Cmty. Coll. Dist. v. EPA*, 482 F. App'x. 219 (9th Cir. 2012)). In response, Maricopa County and Arizona Public Service contend that Sierra Club's energy storage-related comments were so broad and vague that they did not warrant a highly detailed response that considered the myriad of permutations available. MCAQD Resp. at 21-22; APS Resp. at 27, 31-32. Maricopa County further maintains that it responded to the comments appropriately and provides a table with the relevant comments and responses in support of its argument. MCAQD Resp. at 21-27. The Board concludes that Maricopa County adequately responded to Sierra Club's comments regarding paired energy storage.

As Sierra Club rightly observes, the permitting regulations require permit issuers to “[b]riefly describe and respond to all significant comments on the draft permit * * * raised during the public comment period, or during any hearing.” 40 C.F.R. § 124.17(a)(2); *see* Pet. at 31. Additionally, the depth of a permit issuer's response need only be commensurate with the depth of the comments provided. *In re FutureGen Indus. Alliance, Inc.*, 16 E.A.D. 717, 754 (EAB 2015) (citing *In re NE Hub Partners, LP*, 7 E.A.D. 561, 582-84 (EAB 1998) (explaining that the sufficiency of the permitting authority's response need only succinctly demonstrate that all significant comments were considered), *review denied sub nom. Penn Fuel Gas, Inc. v. EPA*, 185 F.3d 862 (3d Cir. 1999)); *see also, e.g., In re La Paloma Energy Ctr., LLC*, 16 E.A.D. 267, 292 (EAB 2014) (holding that lack of specificity in public comments truncates permit issuer's obligations to analyze potential emissions control configurations); *In re Knauf Fiber Glass, GmbH*, 8 E.A.D. 121, 147 (EAB 1999) (permit issuers may provide general justifications when comments are presented in general manner).

The administrative record in this case demonstrates that Maricopa County complied with these directives when considering and responding to Sierra Club's energy storage comments. Among other things, Maricopa County noted that Arizona Public Service needs to construct a reliable electric generating facility that “can meet not only a short peak demand, but also several short peak demands in a row, an extended peak demand, or even several extended peak demands.” RTC

at 8. If Arizona Public Service were reliant on stored energy “for some or all of its peaking power, at some point the stored energy may run out before it can be recharged, making the solution unreliable for meeting the full demand.” *Id.* Thus, Maricopa County concluded, “energy storage is not compatible with the purpose and design of a true peaking facility such as [Ocotillo] to provide rapid, reliable power.” *Id.*

The Board finds no fault with such an analysis in a case where, as here, the underlying comments broadly offered energy storage as a possible option for reducing greenhouse gas emissions from the proposed project, but without providing many particulars on how such reductions might occur. Sierra Club’s focus appeared to be primarily on replacing combustion turbines with energy storage units or on pairing energy storage with fewer turbines, and not necessarily on deploying a paired energy storage/combustion turbine “start-up assistant” combination of the type Sierra Club advocates on appeal. *E.g.*, Sierra Club Comments at 6. As noted by EPA in its brief, it is unclear whether Sierra Club’s reference to “pairing” in its comments was meant to refer to the use of energy storage to replace one or more of the five simple-cycle turbines or, instead, the addition of energy storage options to the proposed project’s five simple-cycle turbines. EPA Br. at 6.

And as discussed more fully above, Maricopa County did consider pairing, notwithstanding the general nature of Sierra Club’s comments. Maricopa County discussed battery and other energy storage options that could be used “in addition to or in place of,” or “to replace all or part of,” the proposed gas turbines. RTC at 4, 6. Maricopa County noted Arizona Public Service’s need to “build a system that can meet not only a short peak demand, but also several short peak demands in a row, an extended peak demand, or even several extended peak demands.” *Id.* at 8. Maricopa County further noted that if Arizona Public Service “were reliant upon stored energy for some or all of its peaking power * * *, at some point the stored energy may run out before it [could] be recharged,” making the option “unreliable for meeting the full demand.” *Id.* Thus, in response to Sierra Club’s comments, Maricopa County determined that “energy storage is not compatible with the purpose and design of a true peaking facility such as the Project to provide rapid, reliable power.” *Id.*; *see also* MCAQD Resp. tbl.1, at 24-27 (listing Sierra Club comments and Maricopa County responses). On this permitting record, Maricopa County adequately satisfied its obligations to respond to Sierra Club’s comments.

6. *The Record in This Case, as a Whole, Supports Maricopa County's Redefining the Source Determination*

When considered as a whole, the permitting record contains ample information about the peaking purpose of the Ocotillo Power Plant Modernization Project and its inherent need for fast and frequent start-up capabilities to stabilize intermittent electrical supplies and fluctuating electrical demands that, together, can result in load swings of 25 to 300 MW in multiple one-minute to one-hour intervals over the course of a single day. *E.g.*, Init. Appl. at 2 & app. B §§ 6.1, 6.3, at 31-32, 35; First Updated Appl. at 2 & app. B §§ 6.1, 6.3, at 32-33, 36; Rev'd Appl. §§ 2.2, 7.1, at 12, 38 & app. B § 7.4.3, at 47-48; Final TSD § 4, at 6-7; RTC at 8. By contrast, the record contains a dearth of information that points in the direction suggested by Sierra Club; namely, that a minimum 10-minute turbine start-up time would be adequate to meet the project's fundamental business purpose. *See* Pet. at 16. Sierra Club has failed to demonstrate how the use of energy storage would achieve Arizona Public Service's business purpose without fundamentally altering the inherent design elements of the facility, which include a quick, 2-minute escalation to full 500 MW generating capacity, as well as the capacity to meet several peaks a day and a sustained demand. Nothing in the record contradicts statements by Arizona Public Service and Maricopa County about the required capacity and response time for this plant.¹⁰

In sum, Maricopa County's characterization of Ocotillo's project purpose and inherent design is consistent with the record materials, and its BACT analysis incorporated a "hard look" at Arizona Public Service's business purpose. Accordingly, Maricopa County did not abuse its discretion in concluding that pairing energy storage with the proposed combustion turbines at the Ocotillo facility would "redefine the source."

¹⁰ Maricopa County and Arizona Public Service also argue that paired energy storage redefines the source in this case because it is a "fundamentally different process from generating electricity through natural gas combustion" that is analogous to a "different fuel source," constitutes a "different generation method," and/or comprises a different way of distributing energy that transforms Ocotillo into a "power purchase and distribution facility." *See* MCAQD Resp. at 33-35; APS Resp. at 14, 20-24. Neither Sierra Club nor EPA focused on these arguments in their briefs. Given the absence of full briefing on these complex issues, and considering the Board's finding that paired energy storage is inconsistent with Ocotillo's business purpose, particularly with Arizona Public Service's need to provide rapid, reliable power escalation capability multiple times per day, the Board need not address these alternative arguments.

The Board's decision should not be read as an automatic off-ramp for energy storage technology as a consideration in Step 1 of future BACT analyses. The Board is cognizant of (and views as significant) the statements in the brief jointly filed by two offices in EPA that describe the recent evolution of energy storage technology as a promising development in the electrical power supply sector that has the potential for reducing air pollutant emissions in some applications. *See* EPA Br. at 1 (citing 80 Fed. Reg. 64,662, 64,901 (Oct. 23, 2015)).

VI. *CONCLUSION AND ORDER*

For the foregoing reasons, the Board concludes that Sierra Club has not demonstrated that review of PSD Permit No. 16-01 is warranted on any of the grounds presented. The Board therefore denies Sierra Club's petition for review.

So ordered.