

IN RE DOMINION ENERGY BRAYTON POINT, L.L.C.

NPDES Appeal No. 07-01

ORDER DENYING REVIEW

Decided September 27, 2007

Syllabus

Dominion Energy Brayton Point, L.L.C. (“Petitioner”) seeks review of a final National Pollutant Discharge Elimination System permit decision (“Final Permit”) for Brayton Point Station (“BPS”) initially issued by the U.S. Environmental Protection Agency (“EPA”) Region 1 (“Region”) on October 6, 2003. The Final Permit is again before the Environmental Appeals Board (“Board”) following the Board’s prior remand and the Region’s subsequent issuance of its Determination on Remand.

The Final Permit continues Petitioner’s authorization to operate the BPS power plant located in Somerset, Massachusetts, near the border of Rhode Island, on the shores of Mount Hope Bay. Among other things, the Final Permit imposes certain limitations under CWA sections 316(a) and (b), 33 U.S.C. §§ 1326(a) and (b), that will effectively require all four of BPS’s electric generating units to be retrofitted from open-cycle cooling systems to closed-cycle cooling systems at considerable cost.

CWA section 316 contains provisions specifically relevant to thermal discharges. 33 U.S.C. § 1326. Under specific circumstances, section 316(a) allows EPA to impose less stringent effluent limitations on thermal discharges than might otherwise be required under section 301. *Id.* §§ 1311, 1326(a). Section 316(b) essentially provides that the location, design, construction, and capacity of cooling water intake structures at point sources must reflect the best technology available for minimizing environmental impact. *Id.*

In its prior appeal, Petitioner challenged a number of aspects of the Final Permit determination. The Board found no clear error with respect to the issues being appealed, except for the following two substantive issues, which were remanded to the Region: (1) the selection of five days as the maximum number of days on which the temperature in Mount Hope Bay was allowed to exceed 24C (“the maximum temperature exceedance frequency”), which the Region used to derive appropriate discharge limitations under CWA section 316(a), 33 U.S.C. § 1316(a); and (2) whether the projected noise impact of closed-cycle cooling – selected as the “best available technology” by the Region pursuant to CWA section 316(b), 33 U.S.C. § 1326(b) – would likely violate the Massachusetts noise regulations. The Board also directed the Region to place in the administrative record a missing document containing the Region’s re-analysis of its production foregone calculation (calculated in the course of selecting the “best technology available” under CWA section 316(b)), and to correct a typographical error in the Final Permit.

In its Determination on Remand, the Region reexamined the remanded issues and ultimately reaffirmed the Final Permit conditions. In so doing, the Region articulated its rationale for selecting the five-day maximum temperature exceedance frequency. Additionally, the Region reexamined whether the imposition of closed-cycle cooling at BPS would likely result in an irreconcilable conflict with any Massachusetts noise regulations and determined that it likely would not. The Region went a step further and also analyzed whether the projected noise from closed-cycle cooling would likely violate noise levels identified in an EPA guidance document and again determined that it likely would not. Finally, in addition to ensuring that the missing production foregone document was included in the record, the Region, in response to this Petition, provided its calculations underlying the re-analysis.

In this Petition for Review, Petitioner challenges the Region's rationale for selecting five days as the maximum temperature exceedance frequency, as well as the Region's decision not to reopen the record for public comment on this issue. Petitioner also contests the Region's determination that the projected noise impact from closed-cycle cooling at BPS likely will not violate EPA guidance, but the Board finds that Petitioner does not meaningfully contest in this Petition for Review the Region's determination with respect to Massachusetts noise regulations. Additionally, Petitioner argues that the production foregone calculations recently provided by the Region establish the Region's clear error with respect to its consideration of the "best technology available" for BPS under CWA section 316(b). Finally, Petitioner seeks to supplement the record with a number of documents not in the administrative record at the time of the Final Permit issuance.

Held: The Petition for Review is denied. The Board determines as follows:

- (1) The Region did not abuse its discretion under 40 C.F.R. § 124.14 when it declined to reopen the record for public comment on the issue of the five-day temperature exceedance frequency where the Region's Determination on Remand did not result in any change to a permit condition or otherwise raise substantial new questions concerning the Final Permit. However, because this is the first opportunity Petitioner has had to comment on the Region's rationale for its selection of five days as the maximum temperature exceedance frequency, the Board finds it appropriate to consider documents submitted with the Petition that were not in the administrative record at the time the Final Permit decision was made, to the extent they relate to the issue of the maximum temperature exceedance frequency. Documents relating to issues that are beyond the scope of remand or otherwise not relevant to the issues on appeal are stricken.
- (2) The Region's selection of five days as the maximum temperature exceedance frequency was rational in light of all the information in the record, taking into account the Region's obligation to assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in Mount Hope Bay. The Board makes this determination based upon the data available, the associated unavoidable scientific uncertainty, and the due deference normally afforded to a permitting authority's technical determinations.
- (3) Although Petitioner does not meaningfully contest the Region's Determination on Remand with respect to whether the projected noise impacts of closed-cycle cooling will likely violate Massachusetts noise standards, the Board's review of the administrative record leads the Board to conclude that the Region's consideration of the noise impacts was reasonable and that the imposition of closed-cycle cooling likely will not result in an irreconcilable conflict with Massachusetts noise regulations. Moreover, the issue of whether the imposition of closed-cycle cooling at BPS will

likely comply with EPA's own guidance on noise is beyond the scope of remand and all discussion on that issue is, therefore, stricken from the record.

- (4) The Region has corrected any deficiency in the administrative record with respect to the production foregone calculations and has satisfied the Board's prior Remand Order in that regard. However, the Region did acknowledge an error in its calculations. Petitioner's argument regarding the Region's error in calculating the production foregone goes beyond the scope of remand, but in any event the Board concludes that such error was harmless, given the insignificant role that the production foregone calculation played in the Region's selection of the best technology available for BPS.

Before Environmental Appeals Judges Edward E. Reich and Kathie A. Stein.

Opinion of the Board by Judge Reich:

On January 2, 2007, Dominion Energy Brayton Point, L.L.C. ("BPS" or "Petitioner"¹) petitioned the Environmental Appeals Board ("Board") to review the final National Pollutant Discharge Elimination System ("NPDES") permit decision issued by EPA Region 1 ("Region") of the United States Environmental Protection Agency ("EPA" or "Agency").² The permit decision is before the Board again following the Region's Determination on Remand, in which the Region addressed issues identified in the Board's prior remand of the permit decision. *See* U.S. EPA, Region 1, Office of Ecosystem Protection, Determination on Remand from the EPA Environmental Appeals Board, Brayton Point Station NPDES Permit No. MA 0003654 (Nov. 30, 2006) ("Determination on Remand"); *In re Dominion Energy Brayton Point, L.L.C.*, 12 E.A.D. 490 (EAB 2006) ("Remand Order"). In our prior decision, we remanded two substantive issues for further explanation by the Region and two procedural tasks. Remand Order at 293-94. In this second petition for review ("Petition for Review" or "Petition"), BPS argues that there remains insufficient evidence to support the Agency's conclusions on the substantive issues remanded and that the Region erred procedurally in failing to reopen the record on one of those issues. Additionally, BPS challenges the Re-

¹ The original permittee for Brayton Point Station was USGen New England, Inc. *See* U.S. EPA Region 1, Clean Water Act NPDES Permitting Determinations for Thermal Discharge and Cooling Water Intake from Brayton Point Station in Somerset, MA (NPDES Permit No. MA 0003654), 1-1 n.1 (Jul. 22, 2002) ("Determinations Document"). However, USGen transferred ownership and title of BPS to Dominion during the course of this permit proceeding. *See In re Dominion Energy Brayton Point, L.L.C.*, 12 E.A.D. 490 at 493 n.1. The terms "Petitioner" and "BPS" used throughout this decision are intended to reference either Dominion or its predecessor in interest, USGen, as appropriate.

² Section 301(a) of the Clean Water Act ("CWA"), 33 U.S.C. § 1311(a), prohibits the discharge of any pollutant from a point source into waters of the United States, except if the discharge is made in compliance with, among other things, an NPDES permit issued under CWA section 402, 33 U.S.C. § 1342. The NPDES program is one of the principal permitting programs under the CWA. *See* CWA § 402, 33 U.S.C. § 1342.

gion on an issue related to one of the procedural tasks remanded. For the reasons that follow, this Petition is denied.

I. BACKGROUND

General background information essential to an understanding of BPS's Petition for Review and this decision is provided below. Additionally, background information specific to individual issues raised is provided in the discussion section that follows. A more complete background discussion relating to this permit may also be found in our prior Remand Order. *See* Remand Order at 1-59.

A. Statutory and Regulatory Background

The CWA prohibits the discharge of any pollutant into the waters of the United States from any point source, except as authorized by permit. 33 U.S.C. §§ 1311(a). The term "pollutant" is expressly defined to include heat. *Id.* § 1362(6). Permits for the discharge of pollutants fall under the NPDES permitting program outlined under CWA section 402. *Id.* § 1342(a). NPDES permits generally contain discharge limitations and establish related monitoring and reporting requirements. 33 U.S.C. 1342(a)(1)-(2). Discharge limitations for existing sources, such as BPS, must comply with CWA section 301. 33 U.S.C. § 1311.

CWA section 316 contains additional provisions specifically relevant to thermal discharges. *Id.* § 1326. Under specific circumstances, section 316(a) allows EPA to impose less stringent effluent limitations on thermal discharges than might otherwise be required under section 301. *Id.* § 1326(a). Section 316(b) essentially provides that the location, design, construction, and capacity of cooling water intake structures at point sources must reflect the best technology available for minimizing environmental impact. *Id.* § 1326(b).

B. Factual and Procedural Background

1. Facts Relevant to This Petition

Brayton Point Station, or BPS, is a forty-year-old electric power plant located in Somerset, Massachusetts, on the shores of Mount Hope Bay near the border of Rhode Island. Remand Order at 15. Mount Hope Bay is a relatively shallow estuary that is an offshoot of Narragansett Bay. *Id.* BPS occupies its northernmost portion. Determinations Document Fig. 2.1-1. Narragansett Bay is a 146-square-mile bay bordering Rhode Island Sound. Remand Order at 15. Several rivers flow into Mount Hope Bay, including the Taunton, the Lee, and the Kickemuit. *Id.*

As is typical of many power plants, BPS uses outside water for cooling purposes in its operations. *Id.* BPS has been operating with an open-cycle cooling system in all four of its electric generating units, withdrawing water from Mount Hope Bay and its tributaries in order to cool (or condense) steam within the facility, then later discharging the then-heated water into Mount Hope Bay.³ *Id.* Under current permit conditions, BPS withdraws close to one billion gallons of cooling water per day and discharges approximately 42 trillion British Thermal Units (“tBTU”) into Mount Hope Bay per year at a maximum discharge temperature of 95-F (35-C). *Id.* This essentially means that a volume of water equivalent to the entire volume of Mount Hope Bay is cycled through the plant seven times each year. *Id.* at 17. The NPDES permit under which BPS continues to operate expired July 16, 1998.⁴ Determinations Document at 6-1.

2. Procedural History

In January 1998, six months prior to the existing permit’s expiration date, Petitioner submitted an NPDES renewal permit application. Remand Order at 17. Although in its initial application, BPS did not request a variance from CWA section 301 requirements under CWA section 316(a), BPS’s later submissions in May 2001 and December 2002 did request such a variance. *Id.* at 18. The Region issued a Draft Permit for BPS on July 22, 2002, along with the lengthy Determinations Document containing the Region’s analysis on a number of issues surrounding the Draft Permit’s issuance.

Of particular relevance to this Petition are the Region’s discharge limits imposed under CWA section 316(a) and its determinations concerning the “best technology available” under CWA section 316(b). More specifically, pursuant to CWA § 316(a), 33 U.S.C. § 1326(a), the Region imposed monthly discharge limits of 9.14 tBTUs or an annual discharge limit of 1.7 tBTUs, with a discharge temperature limit of 95-F.⁵ It is undisputed that compliance with this discharge

³ In an open-cycle cooling system, water is withdrawn from a nearby body of water, run through the system for cooling purposes, and then discharged by the facility into a receiving water body at a higher temperature than the withdrawn water. Remand Order at 16. Thus, there is typically a substantial discharge of “waste” heat into the receiving water. *Id.*

⁴ The permit has been administratively continued, however, because the facility timely applied for permit renewal. *See* 40 C.F.R. § 122.6.

⁵ As explained more fully in Part III.B, below, the Region opted to impose thermal discharge limits pursuant to CWA § 316(a), rather than the more stringent requirements of CWA § 301. Had the Region imposed discharge limits pursuant to CWA § 301, BPS would essentially have been allowed an annual heat load discharge of only 0.8 tBTUs with a maximum temperature of 85-F (29.4-C).

limit can only be accomplished by converting to closed-cycle cooling.⁶ Additionally, the Region determined pursuant to CWA § 316(b), 33 U.S.C. § 1326(b), that “best technology available” for minimizing adverse environmental effects was closed-cycle cooling and imposed cooling water intake system capacity limitations that reflected that technology. Thus, the Region’s determinations under both CWA sections 316(a) and 316(b) effectively and independently required closed-cycle cooling for the entire station.

Between the issuance of the Draft Permit and the Final Permit, the Region accepted in excess of 167 sets of written comments over 75 days and received oral comments at two formal public hearings, each of which were preceded by informal public informational meetings. Remand Order at 19. When the Region issued the Final Permit on October 6, 2003, it also issued a lengthy response to comments document. U.S. EPA Region 1, Responses to Comments, Public Review of Brayton Point Station, NPDES Permit No. MA 0003654 (Oct. 3, 2003) (“Responses to Comments”). The thermal discharge limits and the cooling water intake system requirements imposed in the Final Permit were substantially the same as those proposed in the Draft Permit.

On November 5, 2003, BPS timely petitioned the Board for review of the Final Permit (“first Petition for Review”), challenging a number of conditions of the permit under CWA sections 316(a) and (b). On February 19, 2004, the Board granted review of that petition and on February 1, 2006, remanded the Final Permit to the Region for further consideration of two discrete issues: 1) the selection of five days as the maximum number of days on which the temperature in Mount Hope Bay was allowed to exceed 24C (“the maximum temperature exceedance frequency”), which the Region then used to derive the thermal effluent conditions under CWA § 316(a); and 2) the projected noise impact as it relates to the Region’s selection of the best technology available under CWA § 316(b). *See* Remand Order at 293. The Board also directed the Region to place in the administrative record a missing document containing the Region’s re-analysis of the production foregone calculation (used in selecting the best technology available under CWA section 316(b)), and to correct a typographical error in the permit. *See id.*

Following remand, BPS sought to reopen the administrative record for public comment on each of the remanded issues. *See* Determination on Remand at 31, 60. The Region declined to reopen the record and instead issued its Determination

⁶ In a closed-cycle cooling system, the cooling water itself (once heated by the cooling process) is run through a cooling apparatus, usually some type of cooling tower, in order to reduce the water’s temperature so that it may be reused in the plant’s operations. Remand Order at 16. Thus, instead of being discharged into a receiving water body, waste heat is released into the atmosphere. *Id.*

on Remand on November 30, 2006. *See* Determination on Remand at 30-32, 59-61. In the Determination on Remand, the Region reexamined each issue and ultimately reaffirmed the permit conditions at issue. This second Petition for Review timely followed.⁷ *See* Petition for Review of Nov. 30, 2006 Determination on Remand Issued by Region 1 in Relation to NPDES Permit for BPS (Jan. 3, 2007) (“Pet. for Rev.”).

II. STANDARD OF REVIEW

This Petition for Review was brought pursuant to 40 C.F.R. § 124.19(a). In proceedings brought under 40 C.F.R. § 124.19(a), the Board generally will not grant review unless the petitioner establishes that a permit condition is based on a clearly erroneous finding of fact or conclusion of law, or involves an exercise of discretion or an important policy consideration that the Board determines warrants review. 40 C.F.R. § 124.19(a)(1)-(2); *see In re Hecla Mining Co.*, 12 E.A.D. at 216, 223 (EAB 2006); *In re City of Marlborough*, 12 E.A.D. at 235, 239-40 (EAB 2005); *In re Carlota Copper Co.*, 11 E.A.D. 692, 708 (EAB 2004); *In re Gov’t of D.C. Mun. Separate Storm Sewer Sys.*, 10 E.A.D. 323, 333 (EAB 2002); *In re City of Irving, Mun. Separate Storm Sewer Sys.*, 10 E.A.D. 111, 122 (EAB 2001). The Board reviews permit decisions under part 124 based on the administrative record of the permit decision. Remand Order at 25 & n. 28. The Board’s consideration of an NPDES permit condition is guided by the preamble to the part 124 permitting regulations, which states that the Board’s power of review “should be only sparingly exercised.” 45 Fed. Reg. 33,290, 33,412 (May 19, 1980); *accord In re Teck Cominco Alaska, Inc.*, 11 E.A.D. 457, 472 (EAB 2004). Agency policy favors final adjudication of most permits at the regional level. 45 Fed. Reg. at 33,412; *see also Carlota*, 11 E.A.D. at 708; *Teck Cominco*, 11 E.A.D. at 472. The petitioner bears the burden of demonstrating that review is warranted. *See* 40 C.F.R. § 124.19(a)(1)-(2); *Carlota*, 11 E.A.D. at 708; *Teck Cominco* at 472; *see also In re Amerada Hess Corp.*, 12 E.A.D. at 1, 8 (EAB 2005).

With these principles in mind, we turn to a discussion of the specific issues raised by Petitioner in this matter.

⁷ As in the first Petition for Review, the following parties sought and were granted leave to file amicus briefs in this proceeding: Kickemuit River Council, the Massachusetts Department of Environmental Protection, the State of Rhode Island, Save the Bay – Narragansett Bay, and the Taunton River Watershed Alliance, Inc. *See* Order accepting amicus filings (Mar. 27, 2007); *see also* Remand Order at 21.

III. DISCUSSION

In this second Petition for Review, in addition to several alleged procedural errors, BPS challenges the Region's reaffirmance of its use of five days as the maximum frequency for temperature exceedance in determining the thermal discharge limits under CWA section 316(a). BPS also challenges the Region's analysis of the noise impact in its selection of the best technology available under CWA section 316(b). Finally, BPS asserts that the document the Region added to the record, containing the Region's "production foregone" reanalysis, was insufficient to correct the previously asserted errors. We address each issue in turn below.

A. Procedural Issues

BPS argues that the Region erred procedurally in not reopening the record for public comment. Pet. for Rev. at 18. In anticipation that the Board might not require the permit proceeding to be reopened, BPS alternatively requests that the Board "treat [BPS's] evidentiary submissions as part of the administrative record for this case." *Id.* As still another alternative, BPS argues the Board should consider the "evidentiary submissions" under one of the recognized exceptions to the general rule that the "focal point for judicial review should be the administrative record [] in existence." *Id.* Simultaneously with the Petition for Review, BPS filed a Motion to Supplement the Administrative Record that largely mirrors the discussion contained in the Petition for Review.⁸ In response, the Region filed a Motion to Strike and Opposition to Petitioner's Motion to Supplement the Administrative Record, which BPS opposed.

As previously noted, our consideration of this Petition is based on our review of the administrative record, and because BPS relies, at least in part, on documents it seeks to have added to the administrative record, we consider first these procedural matters raised by the parties before moving on to the substantive matters raised in this Petition.

1. Region's Decision Not to Reopen the Record

BPS contends the Region erred by not reopening the record after raising substantial new questions in the Determination on Remand. Pet. for Rev. at 18. The new information to which BPS refers concerns the issue of the five-day maxi-

⁸ BPS also filed a Motion to Exclude or to Strike Documents from the Administrative Record on the basis that the Region added documents to the record that went beyond the scope of the remand. See Mot. to Exclude at 1. The Region assented, and we granted BPS's motion on March 27, 2007. See Region 1 Assent to Pet'r Mot. to Strike; Order Granting Pet'r Mot. to Strike. As further articulated below, to the extent that any of BPS's submissions respond to documents that have already been stricken, BPS's submissions are also stricken.

imum temperature exceedance frequency, discussed more thoroughly in Part III.B below.⁹ More specifically, BPS argues that the Region's reliance, in the Determination on Remand, on technical documents and regulatory guidance concerning negative growth effects in winter flounder in support of its selection of the maximum temperature exceedance frequency constituted a "substantial change" within the meaning of 40 C.F.R. § 124.14 requiring reopening of the record. BPS bases its claim on the fact that the Region had previously stated that its principal focus in selecting the maximum temperature exceedance frequency was on avoidance behavior in winter flounder.

In its Determination on Remand, the Region provided a number of factors that it had considered in deciding not to reopen the record with respect to its selection of five days as the maximum temperature exceedance frequency. Determination on Remand at 31-32. First, the Region explained that it had neither modified the permit limits nor selected a different maximum temperature exceedance frequency; rather, the Region simply reaffirmed its prior five-day maximum, with a more thorough explanation. *Id.* Second, the Region concluded that its analysis did not raise substantial new questions or issues; rather it simply reevaluated the same issues and questions already raised in the permit proceeding – namely, what the temperature exceedance frequency should be and why. *Id.* Third, the Region stated that its analysis on remand involved the reconsideration of existing data rather than the collection of new data. *Id.* Fourth, the Region's analysis on remand responded to comments regarding the five-day exceedance criterion that were posed by BPS in its original comments on the Draft Permit and that were echoed by the Board in the Remand Order. *Id.* at 30-32. In other words, the analysis supplemented the Region's response to comments. *Id.* Finally, the Region considered the long delay thus far in putting the new BPS NPDES permit into effect and concluded that the time necessary to hold another public comment period and to respond to any new comments received counseled against reopening the proceeding. *Id.*

Under 40 C.F.R. § 124.14(b), a public comment period may be reopened "[i]f any data[,] information[,] or arguments submitted during the public comment period * * * appear to raise substantial new questions concerning the permit." Significantly, the regulations "expressly authorize the Region to compile new materials in an effort to respond to comments submitted on [a draft permit]."

⁹ Although, in its response to the Petition for Review, the Region addresses at length whether it was appropriate to reopen the record with respect to the noise issue, BPS has not raised that issue in this Petition for Review and, therefore, we need not address that issue. *See* Reg. 1 Mot. to Strike & Opp. to Pet'r Mot. to Suppl. Admin. Rec. at 7-12; *see also* Pet. for Rev. at 18-20 (raising only the failure to reopen the record with respect to the five-day threshold issue). We note, however, that the same legal standards discussed below would apply and the Region appears to have thoroughly addressed the issue. *See* Determination on Remand at 59-61; Reg. 1 Mot. to Strike & Opp. to Pet'r Mot. to Suppl. Admin. Rec. at 7-12.

Remand Order at 277 (citing 40 C.F.R. § 124.17(b)). Although the regulations refer to new information raised during a public comment period, they have also been applied to new information raised in a remand proceeding. *See, e.g., In re NE Hub Partners, L.P.*, 7 E.A.D. 561, 584-86 (EAB 1998) (applying 40 C.F.R. section 124.14(b) in the context of a remand proceeding and determining that the region was not required to reopen the public comment period on remand), *aff'd, Penn Fuel Gas, Inc. v. EPA*, 185 F.3d 862 (3rd Cir. 1999). We have previously noted that “[t]he critical elements of [40 C.F.R. § 124.14(b)] are that new questions must be ‘substantial’ and that the Regional Administrator ‘may’ take action.” Remand Order at 278 (quoting *NE Hub*, 7 E.A.D. at 585). Thus, we review a region’s decision not to reopen the comment period under an abuse of discretion standard and afford the region substantial deference.¹⁰ *Id.*; *see also NE Hub*, 7 E.A.D. at 585 (noting that the decision to reopen is largely discretionary and that the Board “has long acknowledged the deferential nature” of the standard under 40 C.F.R. § 124.14(b)) (citing *In re Amoco Oil Co.*, 4 E.A.D. 954, 980 (EAB 1993); *In re Old Dominion Elec. Coop.*, 3 E.A.D. 779, 797 (Adm’r 1992)).

We find no error in the Region’s decision not to reopen the administrative record for public comment. Initially, we note that the Region reaffirmed its selection of five days as the maximum temperature exceedance frequency and, as such, the permit discharge limits remained unchanged. The five-day maximum temperature exceedance frequency on which the thermal discharge limits partially were based was previously subjected to public comment. *See, e.g., Responses to Comments at III-29 to 30* (comments and responses concerning the five-day temperature exceedance criterion). Moreover, our review of the record confirms the Region’s assertion that the Region had previously considered growth effects in the course of establishing the criteria on which the discharge limits were based, and thus the consideration was not new. *See Reg. 1 Mot. to Strike & Opp. to Pet’r Mot. to Suppl. Admin. Rec. at 15* (citing Determinations Document at 6-27, -34 to -38, -44 to -45, -54 to -57). In sum, we do not find that the Region has raised substantial new questions concerning the permit with respect to the five-day temperature exceedance frequency.

We recognize that this is the first time that BPS has had the opportunity to comment on the Region’s rationale for the maximum temperature exceedance frequency. We have previously observed, however, that the appellate review process affords petitioners the opportunity to question the validity of material added to the administrative record by a region in response to public comments. Remand Order

¹⁰ Additional considerations that may inform the region’s decision to reopen are whether permit conditions have been changed, whether new information or new permit conditions were developed in response to comments received during prior proceedings for the permit, whether the record adequately explains the agency’s reasoning so that a dissatisfied party can develop a permit appeal, and the significance of adding delay to the particular permit proceedings. *See, e.g., NE Hub*, 7 E.A.D. at 584-588; *Old Dominion Elec.*, 3 E.A.D. at 797-98.

at 278 (citing *In re Caribe*, 8 E.A.D. 696, 705 n.19 (EAB 2000); accord *NE Hub*, 7 E.A.D. at 587 n.14; *In re Ash Grove*, 7 E.A.D. 387, 431 (EAB 1997)). The same is true for material added by a region in response to a remand.

Accordingly, based on our review of the record and the arguments submitted, and affording appropriate deference to the Region on what clearly is a matter of discretion vested in the Region, we hold that the Region did not abuse its discretion in declining to reopen the administrative record for public comment on the five-day maximum temperature exceedance frequency issue.

2. *Supplementation of the Record*

Because we uphold the Region's decision not to reopen the record, we consider next BPS's request to "treat its evidentiary submissions as part of the administrative record for this case." Pet. for Rev. at 20. BPS identifies seven items that it seeks to have considered. Essentially, these are Exhibits A through F that were submitted with the Petition and Figure 1 attached to Exhibit A. The Region moves to strike all or portions of each of these seven items in addition to portions of BPS's "Table 1," which was attached to its Petition for Review. After discussing general principles governing the content of the administrative record, we will address the status of each of these items in turn.

General principles of administrative law dictate that the official administrative record for an agency decision include all documents, materials, and information that the agency relied on directly or indirectly in making its decision. Remand Order at 39 (citing, e.g., *Bar MK Ranches v. Yuetter*, 994 F.2d 735, 739 (10th Cir. 1993); *Thompson v. U.S. Dep't of Labor*, 885 F.2d 551, 555 (9th Cir. 1989)). Consistent with this administrative principle, EPA regulations provide that final NPDES permit decisions must be based on the administrative record. 40 C.F.R. § 124.18(a). Part 124 contains several provisions specifying the contents of the administrative record for EPA-issued NPDES permits, including lists of required record materials for both draft and final permits as well as guidelines on timing. See Remand Order at 35 (citing, e.g., 40 C.F.R. §§ 124.9, .17(b), .18(b)). With respect to timing, the rules pertaining to the administrative record specifically state that "[t]he record shall be complete on the date the final permit is issued." 40 C.F.R. § 124.18(c); see also Remand Order at 35.

BPS does not contend that any of the documents it seeks to have added to the record were relied on either directly or indirectly by the Region. Nor does BPS contend that the documents it seeks to add fall under any of the provisions governing the record in part 124. Accordingly, to the extent that BPS seeks to supplement the administrative record for the Final Permit that was before the Region at the time the Final Permit was issued, as defined in 40 C.F.R. § 124.18, that request is denied. See Remand Order at 38-41; *In re Gen. Motors Corp.*, 5 E.A.D. 400, 405 (EAB 1994) (declining to consider post-decision data developed after

the final permit was issued and stating that to accept such information “would be to invite unlimited attempts by permittees to reopen and supplement the administrative record after the period for submission of comments has expired”); *see also In re Port Auth. of N.Y. & N.J.*, 10 E.A.D. 61, 97 (EAB 2001).

We presume, however, that BPS instead seeks to have its submissions considered by the Board in support of its arguments in this Petition for Review. Part 124 does not specify if and when the Board, in the course of its review of final permit decisions, may consider materials not included in the administrative record at the time of permit issuance. Nevertheless, as noted above, we have observed that the appellate review process can serve as a petitioner’s first opportunity to question the validity of material added to the administrative record in response to public comment, or in this case, in response to a remand order.¹¹ *See* Remand Order at 36. In such cases, where a petitioner submits documents in response to new materials added to the record by the Region in response to comments or on remand, and where the Board’s task is to review the record and the Region’s rationale for its final decision, it seems logical if not necessary that the Board consider the petitioner’s proffer of evidence in support of its assertion that the Region’s conclusions are erroneous or that the Region erred in failing to take into account such materials. For this reason, among others, we have in the past considered such newly submitted materials in the course of evaluating the merits of a petition. *See, e.g., In re Metcalf Energy Ctr.*, PSD Appeal Nos. 01-07 & 01-08, at 22 n.13 (EAB Aug. 10, 2001) (Order Denying Review); *see also In re Marine Shale Processors, Inc.*, 5 E.A.D. 751, 797 n.65 (EAB 1995); *In re Three Mountain Power, L.L.C.*, PSD Appeal No. 01-05, at 2-3 (EAB Apr. 25, 2001) (Order Dismissing Portion of Petition for Review). With these principles in mind, we examine the materials submitted by BPS.

a. *Graph of Y-O-Y Winter Flounder and Gibson Article*

BPS submits Figure 1 (attached to Exhibit A) and Exhibit E, each for the purpose of demonstrating that the Region has erroneously characterized recent data on the winter flounder population in Mount Hope Bay. Pet. for Rev. at 15-16. Purportedly, each of these documents is intended to rebut the Region’s statement in the Determination on Remand that “in the roughly four years since [the Region] arrived at its conclusion regarding * * * Mount Hope Bay, the [balanced indigenous population] has shown no sign of recovery.” *Id.* (citing Determination on Remand at 12 n.12); *see also* Pet’r Mot. to Suppl. Admin. Rec. at 4, 5. The current status of winter flounder in Mount Hope Bay and whether or not they are

¹¹ As we have explained on numerous occasions, the administrative rules contemplate that the Region may add new materials to the record in response to public comment. *See* 40 C.F.R. § 124.17(b); *see also* Remand Order at 278 (citing *Caribe*, 8 E.A.D. at 705 n.19; *accord NE Hub*, 7 E.A.D. at 587 n.14; *Ash Grove*, 7 E.A.D. at 431).

recovering were not issues that were remanded to the Region. As such, they are not issues we consider relevant to any matter on appeal. Accordingly, we do not consider either Figure 1 or Exhibit E and they are stricken from the administrative record on appeal.

b. *Technical Review of the Determination on Remand
(Production Foregone and Five-day Temperature
Exceedance Frequency Issues)*

Exhibit A contains technical comments on the issues concerning the production foregone analysis and the selection of the five-day temperature exceedance frequency.¹² As noted above, this is the first time that BPS has had the opportunity to comment on the Region's rationale for, or to challenge the validity of documents relied upon in support of, the maximum temperature exceedance frequency. We consider the arguments made in Exhibit A on this issue to be an extension of BPS's briefing in support of its Petition for Review of this issue. Similarly, we consider the section pertaining to the issue of production foregone to be an extension of the BPS's briefing on that issue. As such, they will be considered.

c. *Documents Relating to the Issue of the Five-Day Maximum
Temperature Exceedance Frequency*

Exhibits B, C, and D consist of two scientific articles and a 1977 EPA guidance document.¹³ Each is proffered in response to the Region's explanation for its selection of five days as the maximum temperature exceedance frequency. Because this is the first opportunity BPS has had to challenge the validity of the Region's documents supporting its determination on this issue, we will consider these documents in support of BPS's argument that the Region's selection of five days as the maximum temperature exceedance frequency was not rational in light of the information in the record.

¹² These technical comments also contain arguments on the purported current status of winter flounder in Mount Hope Bay as well as on the Region's selection of 24°C as the temperature threshold. As noted above and in the Order Granting Petitioner's Motion to Strike, issued on March 27, 2007, these issues are not relevant in this appeal and any related arguments contained in Exhibit A will not be considered and are therefore stricken from the record on appeal.

¹³ The three documents in Exhibits B, C, and D, respectively, are: 1) William R. Reynolds, *Fish Orientation Behavior: An Electronic Device for Studying Simultaneous Response to Two Variables*, 34 J. Fish. Res. Board Can. 300 (1977); 2) Lesa Meng & Giancarlo Cicchetti, *Relationships Between Juvenile Winter Flounder and Multiple-Scale Habitat Variation in Narragansett Bay, Rhode Island*, 134 Transactions Am. Fisheries Soc'y 1509 (2005); and 3) Environmental Research Laboratory, Office of Research and Development, U.S. EPA, *Temperature Criteria for Freshwater Fish: Protocol and Procedures* (1977).

d. *Technical Comments on the Noise Issue*

Finally, Exhibit F contains technical comments submitted on behalf of BPS regarding the noise issue. As fully discussed in Part III.C, below, the issue that was raised by BPS in this Petition for Review – whether the projected noise impact of closed-cycle cooling will violate noise levels identified in an EPA guidance document – relates to a portion of the Region’s Determination on Remand that goes beyond the scope of remand. Thus, the Region’s discussion and supporting documentation regarding this issue are stricken from the administrative record and BPS’s appeal of this issue is rejected. *See infra* Part III.C.2. Accordingly, the portion of Exhibit F addressing this issue is also stricken from the administrative record on appeal. Additionally, in this Petition for Review, BPS has not meaningfully contested the only issue with respect to noise that was remanded to the Region – i.e., whether the projected noise impact of closed-cycle cooling likely will violate Massachusetts noise standards. *See infra* Part III.C.1. Because BPS has not meaningfully contested this point in the Petition for Review, the remaining portion of Exhibit F (containing technical comments on the Region’s technical support for its determination that Massachusetts noise standards likely will not be violated) is also stricken from the administrative record on appeal.

Having decided the procedural issues before us, we now move on to address the substantive issues raised by this Petition for Review.

B. *The Region’s Selection of a Five-Day Temperature Exceedance Frequency*

1. *Background*

Under the CWA, thermal discharges from point sources are illegal without a permit.¹⁴ *See* Determination on Remand at 7 (citing 33 U.S.C. §§ 1311, 1362(6)). Permits allowing thermal discharges contain limitations that are based on either available technology or water quality standards for the particular water body affected, whichever is more stringent (“baseline thermal discharge limits”). *Id.* (citing 33 U.S.C. § 1311(b)(1)). Section 316(a) of the CWA establishes a variance procedure that authorizes less stringent limits when the permittee can demonstrate that the less stringent limits “will assure the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife in and on [the body of water into which the discharge will be made]” (referred to as the

¹⁴ The CWA prohibits the discharge of pollutants into “waters of the United States” from point sources, except as authorized by permit. 33 U.S.C. § 1311(a). The term “pollutant” is expressly defined to include heat. *Id.* § 1362(6). Discharges of heated water (i.e., thermal discharges) are thus prohibited under the CWA unless authorized by permit.

“BIP”).¹⁵ 33 U.S.C. § 1326(a). If EPA determines that a proposed variance under section 316(a) will not assure the protection and propagation of the BIP, then EPA must reject that proposed variance but may develop its own variance-based limits.¹⁶ Determination on Remand at 14; Remand Order at 14. When EPA develops its own variance-based limits, it is required to demonstrate that the limits are reasonable and will assure the protection and propagation of a BIP. 33 U.S.C. § 1326(a). However, EPA is not required to demonstrate that its limits are the least stringent limits necessary. *Id.*; Remand Order at 110-12.

In the permitting process, BPS sought a variance under CWA section 316(a) from the baseline thermal discharge requirements. The Region rejected that proposed variance because it did not assure the protection and propagation of the BIP in the Mount Hope Bay estuary. The Board upheld that determination in its decision on the first Petition for Review of the BPS permit. Remand Order at 102. The Region instead imposed its own, significantly more stringent, yet still variance-based, limits. Ultimately, the Region determined, among other things, that in order to protect the BIP, thermal discharges should be limited such that no more than ten percent of Mount Hope Bay exceeds 24C for more than five days¹⁷ per

¹⁵ EPA regulations define the term “balanced indigenous population” as:

a biotic community typically characterized by diversity, the capacity to sustain itself through cyclic seasonal changes, presence of necessary food chain species and by a lack of domination by pollution tolerant species. Such a community may include historically non-native species introduced in connection with a program of wildlife management and species whose presence or abundance results from substantial, irreversible environmental modifications. Normally, however, such a community will not include species whose presence or abundance is attributable to the introduction of pollutants that will be eliminated by compliance by all sources with section 301(b)(2) of the Act; and may not include species whose presence or abundance is attributable to alternative effluent limitations imposed pursuant to section 316(a).

40 C.F.R. § 125.71(c).

¹⁶ As we noted in our prior decision, it remains an open question whether the statute and regulations *require* the Region to impose an appropriate alternative variance in cases where the applicant demonstrates that the baseline discharge limits are more stringent than necessary, but the Region determines the applicant’s proposed variance is insufficiently protective. Remand Order at 14 n.13. We further noted that, although the Agency has generally developed its own variance-based limits in such circumstances, it remains “far from clear” that the statute requires the Agency to follow this practice. *Id.*

¹⁷ In the Determination on Remand, the Region stated that the permit discharge limits were designed to ensure that “no more than 10% of the bay exceeds 24-C for *five or more* days per * * * month.” Determination on Remand at 15, 21 (emphasis added). This language conflicts with language used prior to the remand which stated that the thermal discharge limits in the permit would “ensure that no more than 10% of the bay exceeds 24-C for *more than five days* per month.” *See, e.g.,* Determina-

Continued

summer month.¹⁸ Determination on Remand at 30; Determinations Document at 6-56.¹⁹ BPS challenged every aspect of this determination in its first Petition for Review. The Board upheld the Region's approach, as well as its selection of ten percent of Mount Hope Bay as the maximum areal impact and 24C as the critical temperature threshold.²⁰ Remand Order at 126-27, 132-33. However, the Board remanded the Region's selection of five days as the maximum temperature exceedance frequency, i.e., the maximum number of days on which the temperature in Mount Hope Bay was allowed to exceed 24C, because the Region failed to provide any analysis or rationale for that determination.²¹ *Id.* at 134-35. The Board instructed the Region to provide a rational explanation for its selection of five days as the maximum temperature exceedance frequency or, alternatively, to modify the value and provide adequate support for the modified value. *Id.*

On remand, the Region reexamined the legal and scientific underpinnings of its decision and ultimately reaffirmed its original conclusion that five is the maximum number of days of critical temperature exceedance per summer month that

(continued)

tions Document at 6-56; Remand Order at 116. We believe the Region's reference to "five or more days" in the Determination on Remand is a misstatement. Elsewhere in the Determination on Remand, the Region refers to five days as the "*maximum*" number of days "*allowed*," Determination on Remand at 22, 28, which, conversely, would mean that a temperature exceedance of more than five days would not be permitted. The view that five days is the maximum number of days allowed would be consistent with the original permit decision that the Region specifically indicated it was "reaffirm[ing]." *Id.* at 30. Thus, we refer to the Region's *maximum* temperature exceedance frequency as five days and interpret that to mean that a temperature exceedance of five days would be permissible, but more than five days would not be protective of the BIP.

Additionally, because the misstatement identified above is contained in the Determination on Remand (as opposed to the permit itself), and neither the Region nor the Petitioner has identified this as an issue, we find the error to be harmless. *Cf. In re City of Moscow*, 10 E.A.D. 135, 146 (EAB 2001) (concluding that an inartful, unqualified reference to 4.0 millions gallons per day in a design flow criteria table in a permit was harmless error where the record clearly reflected that throughout the permitting and appeal process neither the region nor the petitioner ever had any question that the permit limitations were based on a design flow of 3.6 million gallons per day).

¹⁸ The "summer" permit conditions apply in June through September. "Winter" permit conditions apply the rest of the year

¹⁹ The actual thermal discharge limit imposed by the permit is 0.14 tBTU which, the Region determined, ensures that no more than 10% of Mount Hope Bay will exceed 24-C for more than five days per month. Determinations Document at 6-56, 8-3.

²⁰ Although, in the Determination on Remand, the Region discussed for context both the 10% areal impact and the 24-C critical temperature criteria, we consider these issues (and that discussion) to be outside the scope of remand.

²¹ In its Responses to Comments, the Region indicated that its rationale was discussed in greater detail "elsewhere," but such discussion was not to be found. Remand Order at 134-35. The Region has since acknowledged that its prior explanation was not sufficiently detailed. Determination on Remand at 22.

would reasonably assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in Mount Hope Bay. Determination on Remand at 30. As articulated further below, the Region's conclusion was accompanied by a thorough explanation of its underlying rationale.

In the second Petition for Review, BPS continues to argue that the Region has failed to adequately support its selection of five days as the maximum temperature exceedance frequency. Pet. for Rev. at 8. BPS contends that the Region misinterprets one of the studies on which the Region relies – the Casterlin & Reynolds study²² – and that without that study, the Region's selection of five days as the maximum temperature exceedance frequency has no biological basis, is arbitrary, and is not supported by the record. *Id.* at 8-10; Pet'r Reply Br. at 5. For the reasons that follow, we hold that the Region's explanation for why it selected five days is rational and is fully supported by the record. As such, BPS has established no clear error or other basis for review of the Region's selection of five days as the maximum temperature exceedance frequency.

2. The Region's Selection of a Five-Day Temperature Exceedance Frequency Was Rational

As an initial matter, we note that it is undisputed that the Region's five-day temperature exceedance frequency will assure protection and propagation of a BIP in Mount Hope Bay. As noted previously, the Region was not required to demonstrate that its limit was the least stringent necessary to protect the BIP. Remand Order at 110-12. Thus, the issue we address here is whether the selection of a five-day temperature exceedance frequency was rational in light of all the information in the record. *See In re Gov't of D.C. Mun. Separate Sewer Sys.*, 10 E.A.D. 323, 348 (EAB 2002) (explaining that when presented with technical issues, the Board "look[s] to determine whether the record demonstrates that the [r]egion duly considered the issues raised in the comments and whether the approach ultimately adopted * * * is rational in light of all the information in the record"); *In re NE Hub Partners, L.P.*, 7 E.A.D. 561, 568 (EAB 1998) (citing cases the Board remanded where a region's decision on a technical issue was illogical or inadequately supported by the record), *aff'd, Penn Fuel Gas, Inc. v. EPA*, 185 F.3d 862 (3rd Cir. 1999); *accord In re City of Moscow*, 10 E.A.D. 135, 142 (EAB 2001). As explained fully below, we believe that the Region's selection of five days was entirely rational given the obligation to assure the protection and propagation of a BIP in Mount Hope Bay, the unavoidable scientific uncertainty, and the data available.

²² Resp. to Pet. for Rev. Ex. R7 (Martha E. Casterlin & William W. Reynolds, *Thermoregulatory Behavior and Diel Activity of Yearling Winter Flounder, Pseudopleuronectes Americanus (Walbaum)*, 7Env. Biol. Fish 177, 177-180 (1982)) [hereinafter Casterlin & Reynolds].

a. *The Scientific Uncertainty in Predicting Thermal Effects*

According to the Region, “predicting thermal effects is a function of species, life stage, exposure temperature, and exposure duration and frequency.” Determination on Remand at 22. “Unfortunately,” as the Region notes, “the scientific literature has not produced data on every possible variation and combination of these factors.” *Id.* Thus, there is inherent scientific uncertainty in predicting precisely how a particular species of fish will react to elevated water temperatures, as well as in determining the extent of exposure required to produce a given reaction. *Id.*

In determining an appropriate temperature exceedance frequency, the Region relied on several basic assumptions, namely that temperature change will produce measurable physiological and behavioral changes, that at the extremes of exposure predictions become more certain, and that at the extremes of exposure, water temperatures that are substantially warmer or cooler than optimum for a species can result in fish mortality. *Id.* at 22. The Region noted at the outset that where greater risk to the BIP was involved, greater certainty as to the protection of the BIP was needed. *Id.* at 14. The Region also noted that, in the absence of sufficient assurance that the BIP will be adequately protected, no variance would be permitted. *Id.*

Given the scientific uncertainty, the Region adopted an admittedly conservative (i.e., more protective) approach in its establishment of variance-based limits for BPS.²³ *Id.* at 15. Consistent with that approach, the Region initially evaluated many species of fish, but ultimately narrowed its focus to the most sensitive, the winter flounder. Remand Order at 107, 114 n.137. And within that species, the Region focused on the juvenile flounder because of the adverse sublethal effects on juvenile winter flounder that are associated with excessive thermal discharges and the likely increase in mortality that could result.²⁴ Determination on Remand at 18. The best habitats for juvenile winter flounder in Mount Hope Bay are the shallow sandy areas that are predominantly found in the area near where

²³ This approach is consistent with the Region’s use of a conservative approach in selecting the critical temperature of 24-C, which the Region indicated it had done in part because the section 316(a) standard for granting variances from otherwise applicable requirements requires the protection and propagation of a BIP. See Remand Order at 127. The Board previously found no clear error in the Region’s decision to take a relatively conservative approach, *id.*, and we see no reason why such an approach would not be appropriate here as well.

²⁴ One reason for limiting thermal discharges is to prevent excessive indirect mortality and sublethal effects. Determination on Remand at 18. Such effects include the avoidance of spawning and nursery habitat and other reactions that inhibit normal growth. *Id.* According to the Region, juvenile winter flounder avoid predators by inhabiting shallow water. *Id.* For juvenile winter flounder, the consequence of being forced to avoid their preferred shallow water habitat because it is too hot is likely to be an increase in deaths due to predation. *Id.*

BPS discharges. Pet'r Reply Br. at 4; Determination on Remand at 16-17. The Region concluded that, if temperatures rise above a certain level for a certain period of time, then juvenile winter flounder will avoid their optimal habitat, grow at reduced rates or suffer other adverse effects inconsistent with the protection and propagation of the BIP. Pet'r Reply Br. at 4 (citing Determination on Remand at 18-21). The Region determined that "[a]dequately controlling * * * adverse thermal impacts is critical to the restoration of the once abundant winter flounder population in Mount Hope Bay." Determination on Remand at 12. We previously upheld the Region's general approach to determining the appropriate discharge limits. Remand Order at 126-27, 132-33.

Because the available scientific literature does not establish (or speculate as to) the exact duration of exposure to critical temperatures that will result in avoidance of nursery habitat by juvenile winter flounder in Mount Hope Bay or elsewhere, and because the available scientific literature does not establish the exact duration of avoidance that will result in significant indirect mortality, there was no definitive threshold for the number of days at or above the critical temperature that the Region should allow. Determination on Remand at 23. Rather, the Region examined the scientific literature containing "evidence of a variety of harmful behavioral and physiological changes that occur by various points across a spectrum of exposure times." *Id.* Ultimately, the Region based its determination of the maximum temperature exceedance frequency on: 1) the available scientific literature; 2) hydrothermal modeling results; and 3) the exercise of reasonable discretion and judgment in the face of unavoidable scientific uncertainty. *Id.* at 22.

Initially, we should note that the exercise of such discretion necessarily involves the consideration of scientific information that is highly technical and specialized. As more fully explained in the Remand Order, the Board typically will defer to the Region on issues that are fundamentally technical in nature. Remand Order at 27-28 (citing *In re Peabody W. Coal Co.*, 12 E.A.D. at 22, 23 (EAB 2005) (explaining the heavy burden on petitioners seeking review of a permit based on issues that are fundamentally technical in nature); *In re Carlota Copper Co.*, 11 E.A.D. 692, 708 (EAB 2004) (explaining that "a petitioner seeking review of issues that are technical in nature bears a heavy burden because the Board generally defers to the Region on questions of technical judgment")); *see also In re Envotech, L.P.*, 6 E.A.D. 260, 284 (EAB 1996) ("absent compelling circumstances, the Board will defer to a [r]egion's determination of issues that depend heavily upon the [r]egion's technical expertise and experience"). Affording deference to the agency (and, consequently, assigning a particularly heavy burden to the petitioner) in reviewing such matters "serves an important function within the framework of the Agency's administrative process; it ensures that the locus of responsibility for important technical decisionmaking rests primarily with the permitting authority, which has the relevant specialized expertise and experience." Remand Order at 27 (quoting *Peabody*, 12 E.A.D. at 33).

BPS seems to suggest that some greater level of scientific certainty is required. Pet. for Rev. at 8-9 (referring to the Region's recognition of the scientific uncertainty involved as a "concession" and arguing that the Region's conclusions are arbitrary and without biological basis because "[t]he available scientific evidence fails to discuss what duration of exposure to elevated temperatures will elicit an avoidance response in juvenile winter flounder or what duration of their avoidance of habitat will result in harm to the BIP"). We disagree. In the face of unavoidable scientific uncertainty, the Region is authorized, if not required, to exercise reasonable discretion and judgment. See 33 U.S.C. § 1326(a) (requiring that applicants for a variance demonstrate "to the satisfaction of the [Agency]" that baseline discharge limits are more stringent than necessary); 40 C.F.R. § 125.73 (providing that the Region may consider any information that the Regional Administrator deems relevant in determining whether or not the protection and propagation of the BIP will be assured); see also *In re Pub. Serv. Co. of N.H.*, 1 E.A.D. 332, 347 (Adm'r 1977) (explaining in the context of 316(a) determinations that mathematical certainty may be impossible to achieve and that "the Regional Administrator * * * must make decisions on the basis of the best information reasonably attainable") (quoting U.S. EPA, Draft 316(a) Technical Guidance – Thermal Discharges at 7 (Sept. 30, 1974)); cf. *Mass. v. EPA*, 127 S. Ct. 1438, 1463 (2007) (stating in another context that EPA cannot avoid a statutory obligation to regulate by noting general uncertainty surrounding the regulation and that, if scientific uncertainty prevents EPA from making a reasoned judgment, then EPA must say so). Moreover, if BPS were correct and the lack of more specifically relevant scientific literature precluded the Region from selecting a maximum temperature exceedance frequency that it believed ensured the protection of the BIP, then no variance would be permitted and the more stringent baseline thermal discharge limits would be imposed.

We find the Region's general approach to dealing with the underlying scientific uncertainty in this case to be reasonable. Keeping in mind the Region's obligation to ensure the protection and propagation of the BIP, and the scientific uncertainty involved, we further examine below the Region's rationale behind the selection of five days as the maximum temperature exceedance frequency.

b. *The Data Relied Upon*

The Region began by eliminating one or two days as the appropriate temperature exceedance frequency primarily based on the associated uncertainties. Determination on Remand at 24. Specifically, it is unknown whether a one- or two-day exceedance would trigger an avoidance response from juvenile winter flounder, and it is unclear whether an avoidance caused by a one- or two-day temperature exceedance would have any critical effect (the Region theorized, for example, that "it is possible that organisms driven from the critical nursery habitat might be able to safely return after a relatively short transgression of the critical temperature"). *Id.* Given the scientific uncertainties and the fact that section

316(a) requires “reasonable assurance of the protection and propagation of a [BIP]” as opposed to a “no effects” standard, the Region ruled out a one- or two-day maximum temperature exceedance frequency. *Id.* Because that particular determination was not challenged in this proceeding, we accept it for purposes of our analysis.

With respect to a possible three-day exposure limit, the Region noted that one scientific study – the Casterlin & Reynolds study, cited in note 22, above – provides a reasonable basis for concluding that by the end of three days of exposure to the critical temperature of 24C, juvenile winter flounder would likely choose (to the extent possible)²⁵ to express their temperature preference by avoiding waters at that temperature. Determination on Remand at 24, 28. In the three-day study, juvenile winter flounder were placed in a two-chambered shuttlebox. *Id.* (citing Casterlin & Reynolds at 178). According to BPS, when a fish was present in one of the chambers, a heater caused the water temperature to rise while, simultaneously, a cooling element caused the water in the unoccupied chamber to grow colder until the flounder chose to leave the warmer chamber to go to the cooler one. *Id.* The study observed each fish’s movements between the two chambers for three days to ascertain, among other things, thermoregulatory behavior (preferred and avoided temperatures). Casterlin & Reynolds at 178. By the end of the study, the authors were able to present, and draw conclusions regarding, preferred and avoidance temperatures based on the distribution of temperatures frequented by juvenile winter flounder. Thus, the Region relied on the study as an indication that by three days, juvenile winter flounder are likely to have exhibited their temperature preferences.

The Region did not select three days as the maximum temperature exceedance frequency, however, for two main reasons: (1) the uncertainty involved in translating the Casterlin & Reynolds study from the laboratory to the real world of Mount Hope Bay; and (2) the uncertainty involved in predicting the overall effect of avoidance associated with three days of exceedance of the critical temperature. Determination on Remand at 25. Thus, the Region viewed three days as a “baseline” value for exposure time necessary to trigger avoidance but decided to factor in an additional margin for the maximum temperature exceedance frequency. *Id.* at 24-26, 28-29.

BPS contends that the Region erroneously relied on the Casterlin & Reynolds study in establishing three days as the low end of the range of days to be considered in selecting the temperature exceedance frequency. Pet. for Rev. at 10. First, BPS argues that the Region’s conclusions were based on a fundamental mis-

²⁵ The Region noted that juvenile winter flounder will only be able to avoid the thermal plume if it is not too far to swim beyond or if they are able to burrow into the sediment. Determination on Remand at 24 n.23.

understanding of the study as demonstrated by the Region's erroneous description of the chambers as having been maintained at a constant temperature. *Id.*; *see also* Determination on Remand at 24. In its Response to the Petition for Review, the Region agrees that it mistakenly described the methodology of the study in the Determination on Remand – i.e., the temperatures in the chambers were not constant and did vary – but the Region denies the error had any import because the ultimate conclusions drawn by the authors of the study, upon which the Region had relied, remain the same regardless. Resp. to Pet. for Rev. at 35-36; *see also* Determination on Remand at 24-25. We agree the error had no significance.²⁶

Next, BPS asserts that the Casterlin & Reynolds study tested preference rather than avoidance temperature. Pet. for Rev. at 11. BPS does not, however, explain this distinction or its import in the context of this case. Nor do we find this to be an important distinction, particularly in the context of the study described – in other words, when a fish opted to *avoid* one chamber (i.e., chose to leave the chamber it occupied for the other), it would simultaneously have exhibited a *preference* (i.e., chose to occupy a different chamber over the one it had been in). This is consistent with the authors' description of the study as measuring thermoregulatory behavior, which was further described as "preferred and avoided temperatures." Casterlin & Reynolds at 178; *see also* Remand Order at 125 n.151 (describing the study's authors as discussing both the "avoidance response" temperature and the temperature "preferendum"). Moreover, any strength this assertion could otherwise have had is undermined by BPS's own prior assertion that the study "concluded that avoidance began approximately at 27 [degrees Celsius]." *See* Resp. to Pet. for Rev. at 29 (quoting Br. in Supp. of USGen's Appeal of the NPDES Permit for Brayton Point Station at 13, 16 n.31 (June 7, 2004)).

²⁶ As the Region explained, the authors of the study presented the results of the study in a graph demonstrating temperature preferences. Determination on Remand at 24. Further, the authors also make conclusions regarding "avoidance responses" and temperature "preferendum" based on the study. *Id.* (citing Remand Order at 125 n.151); Casterlin & Reynolds at 179. Because the Region's conclusion was based on its (and the authors') interpretation of the results of the study and not on its flawed description of the methodology, the error in describing the methodology was harmless. *See In re City of Moscow*, 10 E.A.D. 135, 146 (EAB 2001) (concluding that an inartful, unqualified reference to erroneous design flow criteria in a permit was harmless error where the record clearly reflected that throughout the permitting and appeal process neither the region nor the petitioner ever had any doubt concerning the correct basis for the permit limitations); *In re Steel Dynamics, Inc.*, 9 E.A.D. 740, 749 (EAB 2001) (concluding that allegedly erroneous analogy used to justify Agency's reliance on data from certain sources in making its permitting decision was harmless where the Agency had articulated other legitimate bases for relying on data from those sources); *In re Spokane Reg'l Waste-to-Energy*, 2 E.A.D. 809, 815 (CJO 1989) (failure on the part of the permit issuer to consider an alternate technology was harmless error where no such consideration was required and would only serve to satisfy academic concerns, but would have no effect on the outcome).

Finally (with respect to the Casterlin & Reynolds study), BPS argues that the study did not test avoidance (or preference) over time. Rather, the study simply lasted for three days, with no indication of when exactly during that time the flounder began to exhibit signs of avoidance. Pet. for Rev. at 11. Again, BPS fails to explain the import of this assertion. Based on the study, the Region concluded simply that “by three days” the flounder would likely have exhibited a response, i.e., would likely have chosen to avoid waters above the critical avoidance temperature. This conclusion is not dependent on a record of precisely when during the three days the avoidance behavior began, only on the fact that at the end of the three days most fish had displayed an avoidance response. Certainly, the authors concluded that by three days the data gathered demonstrated preferred and avoided temperatures. Casterlin & Reynolds at 179. Moreover, to the extent that signs of avoidance occurred prior to the end of the three-day study, the indication would be that a baseline temperature exceedance frequency of fewer than three days might be appropriate. The Region had already ruled out a one- or two-day temperature exceedance frequency for the reasons stated above and, in any case, BPS’s contention is that the Region’s temperature exceedance frequency should be *greater* than five days, not fewer than three. See Pet. for Rev. at 6 (arguing that “there is still no support in the record whatsoever that juvenile winter flounder exposed to elevated temperatures for fewer than seven days will experience adverse effects”). We cannot see how BPS’s argument, the logical conclusion of which is that three days may be too long a period to prevent avoidance, can possibly help BPS in this appeal.

At the very least, BPS’s arguments surrounding the Region’s reliance on the Casterlin & Reynolds study identify a disagreement over the proper interpretation of a scientific study and, as stated previously, we generally defer to the expertise of the Region in such cases. See *In re Envotech, L.P.*, 6 E.A.D. 260, 284 (EAB 1996); *In re NE Hub Partners, L.P.*, 7 E.A.D. 561, 567 (EAB 1998) (explaining that clear error – or a reviewable exercise of discretion – is not established by documenting a difference of opinion or an alternative theory on a technical matter; rather, where views of the region and the petitioner indicate bona fide differences in expert opinion or judgment on a technical matter, the Board typically defers to the region). Accordingly, we are not persuaded that either the Region’s admittedly erroneous description of the study’s methodology or its overall reliance on the study’s conclusions resulted in clear error warranting review.

As previously noted, the Region, rather than using three days as the duration limit, chose to factor in an additional margin for the threshold for critical temperature exceedances. Determination on Remand at 25-26. In considering how far to go beyond three days, the Region took into account the fact that the modeling studies indicated that when the critical temperature is exceeded for two, three, or more days in a month, the days of exceedance are mostly likely to be consecutive. *Id.* at 23, 26. The Region also considered evidence that thermal stress in fish accumulates more quickly than it dissipates, which underscores the necessity of

minimizing the duration, frequency, and absolute number of exposures to high temperatures. *Id.* at 26. Moreover, as the number of exceedance days increase above three, it becomes more likely that the exceedance will, in fact, cause avoidance, and as the duration of avoidance increases, the risk of indirect mortality and adverse sublethal effects increases. *Id.*

In determining the upper bound of the range, the Region considered an EPA water quality criteria document often referred as the “Gold Book.” Office of Water, U.S. EPA, EPA/440/5-86-001, *Quality Criteria for Water 1986* (May 1, 1986) [hereinafter Goldbook]. The “Gold Book” is a water quality standards-related document that does not specifically address section 316(a)’s variance procedure or standard. Its stated purpose, however, is to present scientific data and guidance concerning the environmental effects of pollution, including heat, which can then be used to derive regulatory requirements. Gold Book at 2. Among other things, the Gold Book discusses thermal effects on fish and recommends water quality criteria for certain pollutants, including heat. It presents a formula for determining a maximum weekly average temperature for fish, based in part on the particular species’ optimum temperature for growth. *Id.* at 283. According to the Region, for juvenile winter flounder, this results in a maximum seven-day average temperature of approximately twenty degrees Celsius. Determination on Remand at 27. As noted, this standard for temperature exceedance is based on optimal *growth*. The Gold Book cites growth as a particularly sensitive measure for chronic temperature stress and characterizes an exposure of more than one week as “extensive.” *Id.* at 27 (citing Gold Book at 283).

BPS’s contends that EPA erred in relying on “guidance documents” – i.e., the Gold Book – because the Region had previously chosen to focus on avoidance behavior rather than growth effects. Pet. for Rev. at 11-12. We find this argument to be unavailing. Although the Region’s selected focus for determining the temperature exceedance frequency was primarily avoidance behavior (rather than growth impacts), the Region’s overarching statutory obligation was to determine criteria necessary to assure the protection and propagation of the BIP.²⁷ Determination on Remand at 19. This is true regardless of whether the Region opts to focus on growth or avoidance indicators, or both. As such, it would be unreasonable for the Region to not consider extensive negative effects on growth in determining discharge limitations that will assure the protection and propagation

²⁷ The Region explained that it had decided to focus *principally* on avoidance temperatures because they demonstrate “clear significant harm to the BIP,” whereas the overall effect of “short-term” reductions in growth rates is less clear. Determination on Remand at 19, 23. The Region, however, did not choose to focus on avoidance temperatures to the exclusion of growth effects, particularly where the effects on growth are neither insignificant nor short term. *Id.*; see also Resp. to Pet. for Rev. at 21-22. As further articulated above, to do so would have been to contravene its statutory obligation to assure the protection and propagation of the BIP.

of the BIP.²⁸ Thus, the Region concluded that if, according to the Gold Book, exposure to temperatures exceeding *twenty degrees* Celsius for seven days would result in extensive effects on growth, then seven days at temperatures above 24C would not provide reasonable assurance of the protection and propagation of the BIP, irrespective of any evidence of avoidance.²⁹ Accordingly, the Region determined that a temperature exceedance frequency of seven days or more would not be appropriate, leaving a range of four to six days.

The Region also considered two research studies measuring growth rates in caged juvenile flounder after exposure to temperatures of 24C and above for ten days and between ten and fifteen days, respectively. Determination on Remand at 28 (citing Susan M. Sogard, *Variability in Growth Rates of Juvenile Fishes in Different Estuarine Habitats*, 85 Marine Ecology Progress Series 35 (1992) (AR 4011); Lesa Meng, et al., *Using Winter Flounder Growth Rates to Assess Habitat Quality in Rhode Island's Coastal Lagoons*, 201 Marine Ecology Progress Series 287 (2000) (AR 4013)). Again, the Region noted that while it had focused primarily on avoidance effects, it could conclude from the results of these studies that exposure to the critical temperature of 24C for ten or more days would likely have significant adverse effects on growth, which would not adequately assure the protection and propagation of the BIP.³⁰ *Id.*

BPS asserts that these studies do not support the Region's selection of five days as the maximum temperature exceedance frequency because they analyzed growth effects after ten days. Pet. for Rev. at 12. In this regard, BPS misses the

²⁸ In addition to arguing that the Region should not have relied on the guidance documents – a contention with which, as described above, we disagree – BPS also later contends the Region erred when it departed from Agency guidance documents (including the Gold Book). Pet. for Rev. at 14. In this latter argument, BPS contends that “[t]he Agency’s standard references concerning thermal and water quality effects in aquatic life and habitats * * * use a duration of seven days” when evaluating exposure to heat. BPS goes on to argue that the guidance documents are relevant and that the Region erred in departing from them. *Id.* It is unclear how BPS translates the Agency’s “use” of seven days in evaluating exposure to heat into a requirement that the Region select seven or more days as the maximum temperature exceedance frequency in the context of a section 316(a) variance analysis. Regardless, BPS’s arguments (both that the Agency erred in relying on the guidance and that the Agency erred in departing from the guidance) amount to a disagreement over the Region’s interpretation and application of Agency guidance. As articulated above, based on the information before us, we find the Region’s use of and reliance on this guidance as one factor in selecting the temperature exceedance frequency for BPS to be reasonable.

²⁹ We note that BPS’s own technical review of the Determination on Remand seems to acknowledge that EPA guidance provides support for a temperature exceedance frequency of seven or more days. See Pet. for Rev. ex. A at 11.

³⁰ The Region also concluded the the Meng and Sogard studies did not indicate the appropriateness of any lesser exposure period than 10 days because shorter exposure times were not tested and it was unclear from the data presented what impacts occurred prior to 10 days. Determination on Remand at 28.

point. The Region used these studies to rule out ten or more days, which served to narrow the range of days from which it would ultimately select a maximum temperature exceedance frequency. In this context, the Region's reliance on the studies was perfectly rational. BPS also makes general assertions with respect to the Region's interpretation of the findings of the studies. *Id.* At most, this portion of BPS's argument amounts to a technical disagreement over the interpretation of studies. Here, we will again defer to the Region's expertise in technical matters. *See Envotech*, 6 E.A.D. at 284. In addition, having determined that the Region's exclusion of a time period of seven or more days based on the Gold Book was not clear error, additional studies showing the inappropriateness of a temperature exceedance frequency of ten or more days are of no real significance.

Thus, the Region was left to determine a value between three and seven days – i.e., four, five, or six days – as the maximum number of days of allowable temperature exceedance. Given the depleted state of Mount Hope Bay, the Region's obligation to assure the propagation and protection of the BIP, the technical uncertainty surrounding the issues, and risks to the winter flounder population if the Region erred in its judgment, the Region concluded that a critical temperature exceedance threshold of five days was reasonable. Determination on Remand at 29. In so concluding, the Region noted that the value was in the middle of the narrow range of values that remained under consideration and that it was consistent with its approach of selecting reasonably conservative values throughout its CWA § 316(a) variance analysis. The Region also noted that no party to the permit proceeding had offered any evidence specifically establishing that five days was excessively stringent or that a specific alternative value would be sufficient to assure the protection and propagation of the BIP.³¹ *Id.* The Region also noted that its selection of five days was consistent with the Massachusetts Department of Environmental Protection's ("Massachusetts DEP's") "mixing zone analysis," which indicates, in the context of analyzing water quality standards, that allowing avoidance temperatures to be exceeded for five or more days per month would be unacceptable.³² *Id.* at 26-27 n.25.

³¹ As noted previously, the Region was not required to demonstrate that its five-day limit is the least stringent necessary to assure the protection and propagation of the BIP. 33 U.S.C. § 1326(a); Remand Order at 110-12.

³² BPS seems to suggest that any information from the mixing zone analysis is irrelevant because that analysis was developed in the context of meeting water quality standards and the Region, in granting a CWA § 316(a) variance from the baseline requirements, has already determined that limits based on water quality standards would be more stringent than necessary to protect the BIP. Pet. for Rev. at 9-10. However, as BPS recognized in its second Petition for Review, the Region relied on the Massachusetts DEP's "mixing zone analysis" only to confirm its selection of the five-day temperature exceedance frequency, and not as the basis for that selection. *Id.* at 10. In its Determination on Remand, the Region noted "the general similarity between the CWA section 316(a) requirement to provide thermal conditions assuring the protection and propagation of the BIP and the requirement under the applicable Massachusetts water quality standards * * * that conditions be maintained to provide

Continued

Based on our review of the record before us, taking into account the Region's obligation to assure the protection and propagation of the BIP and the unavoidable scientific uncertainty associated with determining a temperature exceedance frequency, and affording to the Region's technical determinations the appropriate deference, we hold that the Region's selection of a five-day temperature exceedance frequency was clearly rational in light of the information available and reflected a consideration of all issues raised by BPS. As such, we find no clear error supporting review of the temperature exceedance frequency or the discharge limit based thereon.

C. The Region's Consideration of Noise Impacts

CWA section 316(b) governs cooling water intake structures at point sources such as BPS. 33 U.S.C. § 1326(b). Among other things, that section requires EPA to set standards for the capacity of cooling water intake structures that reflect the "best technology available for minimizing adverse environmental impact." *Id.* The Final Permit for BPS sets a capacity flow limit that reflects the performance capability of closed-cycle cooling, which the Region determined was the "best technology available." *See* Determinations Document at 7-170.

In determining the best technology available for BPS, the Region considered noise impacts as a secondary effect of installing and using cooling towers. As we explained in the Remand Order, noise impacts may be relevant to the section 316(b) analysis to the extent that the noise impacts of a proposed technology would result in a violation of legal limits on noise, because those noise impacts could render that technology "unavailable."³³ Remand Order at 285; *see also* Determination on Remand at 36 ("EPA has deemed it appropriate to consider non-water environmental effects * * * in setting technology-based intake limits under the [best technology available] standard of [section] 316(b)") (citing NPDES Regulations Addressing Cooling Water Intake Structures for New Facilities, 66 Fed. Reg. 65,256, 65,282-84, 65,306 (Dec. 18, 2001)). In other words, if the implementation of closed-cycle cooling towers at BPS would not be legally possible due to the noise impacts, then it may be unreasonable to consider it the best technology available.

(continued)

excellent or healthful fish habitat." Determination on Remand at 26 n.25. The Region regarded the basic concordance between itself and the Massachusetts DEP on the five-day value as further evidence that the value was both adequately protective and reasonable. *Id.* The Board agrees.

³³ As the Region points out in its Determination on Remand, the discretion to consider non-water environmental impacts – such as noise – when determining the "best" technology available is not limited to a consideration of whether the particular technology is legal. Determination on Remand at 36-37. Secondary effects are appropriate for consideration, even when those effects do not raise questions of illegality. *Id.* (citing NPDES Regulations Addressing Cooling Water Intake Structures for New Facilities, 66 Fed. Reg. 65,256, 65,283-84 (Dec. 18, 2001)).

1. *Compliance with Massachusetts Noise Limitations*

In its first Petition for Review, BPS argued that the Region had not demonstrated that BPS could be converted to closed-cycle cooling without violating Massachusetts noise requirements. First Pet. for Rev. at 27. More specifically, BPS argued the Region had misconstrued Massachusetts noise regulations in evaluating whether the noise limitations would be exceeded. *Id.* According to BPS, the Region had considered only the increase in noise that would occur as a result of the new closed-cycle cooling technology, but Massachusetts regulations require the Region to take into account *not only* the noise impacts of this technology *but also* the noise impacts of any air pollution control devices that would be installed *and* existing facility noises, and then to compare those projected noise levels to the “ambient” noise levels, levels that would exist in the absence of the facility, to determine whether the increase in noise would exceed Massachusetts noise limitations. *Id.*; *see also* Remand Order at 287.

Although not explicit from the briefing in the first Petition for Review,³⁴ the specific noise limitation to which BPS was referring is one that provides that “[a] source of sound will be considered to be violating the [Massachusetts DEP’s] noise regulation (310 [Mass. Code Regs.] 7.10) if the source * * * [i]ncreases the broadband sound level by more than 10 dB(A) above ambient” (“the 10 dB(A)-above-ambient limitation”). Massachusetts DEP, Division of Air Quality Control Policy No. 90-001 (Feb. 1, 1990) (AR 4004); BPS Comments on Draft NPDES Permit No. MA 0003654, at 43 & vol.2, tab 13 at 3 (Oct. 4, 2002) (AR 3263) (arguing that closed-cycle cooling, based on a 72-cell tower, would result in an increase of at least 14 to 16 dB(A) over ambient sound levels, which is in excess of the Massachusetts DEP limit of a 10 dB(A) for incremental in-

³⁴ In BPS’s first Petition for Review, the entire argument with respect to noise impacts was as follows:

Region I acknowledges in the Response [to Comments] that the Station will have to comply with Massachusetts regulations concerning noise, Response at IV-83; Response, App. L at 3, but then misconstrues those regulations. The [Massachusetts DEP] measures noise increases against a true background, which would require the Station to consider the noise effect of the cooling towers *and the basic station operations*. *See* E-mail from [Massachusetts DEP] to [Region 1] * * * Attachment D [to the first Petition for Review]. Region I did not even attempt to demonstrate that the 72 cooling towers needed for closed-cycle cooling, taken together with existing station operations, could be operated within the regulatory limit, and therefore has not demonstrated that the state noise requirements can be met.

First Pet. for Rev. at 27. In an accompanying footnote, BPS argued that this alleged error was further compounded by the fact that the Region also did not take into account the impacts of required air pollution control equipment. *Id.* at 27 n.25.

crease over ambient in existing sound levels); Responses to Comments app. L at 3, 7 (erroneously citing a Massachusetts DEP regulation, 310 Mass. Code Regs. 7.10, as the source of the 10 dB(A)-above-ambient sound limitation and concluding that the projected increase in sound, with current state-of-the-art noise-control measures, would be below that limitation); *see also* Remand Order at 287. In opposition, the Region argued, among other things, that it had considered the noise impacts and concluded that cooling tower noise emissions could be adequately mitigated and that nothing in the Region's analysis indicated an irreconcilable conflict between anticipated noise emissions and Massachusetts noise regulations. EPA Region 1 Resp. to Pet. for Rev. at 113-14 (Dec. 30, 2003) (citing Responses to Comments app. L ["Noise Impact Assessment"] (AR 3347)).

After fully considering the matter, the Board determined that, although the Region had considered potential noise impacts and whether they would violate the Massachusetts noise regulations, the Region had not addressed the question of how the Massachusetts DEP determines "ambient" noise levels. Additionally, the Board explained, if Massachusetts DEP does in fact determine "ambient" noise levels without including the existing facility's noise emissions, then the Region had not considered whether the noise generated from the implementation of closed-cycle cooling, together with the existing facility's noise, would likely exceed the 10 dB(A)-above-ambient noise limitation.³⁵ Remand Order at 287. Thus, the Board concluded, the record "lack[ed] sufficient information to indicate whether or not BPS, if converted to closed-cycle cooling, [would] likely violate Massachusetts' noise regulations." *Id.* On remand, the Board instructed the Region to "supplement its response to comments with a rationale that addresses Petitioner's concerns raised on appeal or to modify the permit requirements, as appropriate." *Id.* at 288.

The Region reevaluated its interpretation of Massachusetts noise regulations and the potential noise impact of closed-cycle cooling at BPS in its Determination on Remand. Ultimately, the Region again concluded that BPS could convert entirely to closed-cycle cooling and likely comply with Massachusetts noise control regulations and not cause otherwise unacceptable noise impacts. Determination on Remand at 33, 46, 56, 59.

Significantly, in this second Petition for Review, BPS does not raise as an issue the Region's renewed determination that the projected noise impacts of

³⁵ The Board also raised several subsidiary questions in this regard. For example the Board questioned whether Massachusetts would include existing background noise, including the noise generated by the facility in its current configuration, as "ambient" noise, and whether the state would consider the "source of sound" to be the entire facility or solely the cooling towers. Remand Order at 287 n.346.

closed-cycle cooling likely will not violate Massachusetts noise standards.³⁶ As such, any concerns BPS may have had appear either satisfied or abandoned. Nevertheless, in the interest of being thorough in our review and affirmation of the permit following remand, we summarize below the Region's reanalysis of the noise impacts, which clearly supports its determination in relation to the Massachusetts noise limitations.

On remand, the Region clarified that Massachusetts *regulations* simply prohibit "unnecessary emissions" from certain "sources of sound that may cause noise."³⁷ Determination on Remand at 48; *see* 310 Mass. Admin. Code 7.10 (mo, day, year). Massachusetts regulations do not set any specific numeric standards limiting sound emissions. Consequently, whatever the numeric noise impact of closed-cycle cooling towers at BPS will be, it cannot result in a per se violation of the state's regulations. Rather, the determination of whether Massachusetts regulations will be violated depends on whether the Massachusetts DEP determines that the sound emanating from BPS constitutes "unnecessary emissions" that in turn constitute "noise," or "air pollution."³⁸ To help put this general regulatory limit on noise into practice, the Massachusetts DEP relies in part on a written policy containing guidelines for use in enforcing the noise regulation. That policy is the DEP's Division of Air Quality Control Policy No. 90-0001 (Feb. 1, 1990), which contains, among other things, the 10 dB(A)-above-ambient limitation on sound increases. Thus, although the Massachusetts noise limit (i.e., the 10dB(A)-above-ambient noise limitation) was referred to by both BPS and the Region as a "regulation," or "regulatory limit," the language is actually found in a Massachusetts DEP guidance document and not in the Massachusetts administrative code.³⁹ *See* Determination on Remand at 44, 48-49.

³⁶ This petition alleges only that the Region's analysis on remand was incorrect "[a]t least as to EPA's own guidance"; it makes no arguments or assertions relative to the Massachusetts requirements.

³⁷ "Noise" is further defined as "a sound of sufficient intensity and/or duration as to cause or contribute to a condition of air pollution." 310 MA ADC 7.00.

³⁸ As the Region has consistently explained, the ultimate authority to determine whether the cooling towers will meet the Massachusetts requirements for noise rests with the Massachusetts DEP. *See, e.g.,* Responses to Comments at IV-83; Resp. to [first] Pet. for Rev. at 113; Determination on Remand at 37. That determination will be made at a later time, apparently under the state's "plan approval" process. Determination on Remand at 37. What is required of the Region, during this NPDES permitting process, is that it conduct a reasonable consideration of the noise issues in the context of selecting the best technology available pursuant to CWA section 316(b), to ensure that the technology is in fact the "best" option available given a number of competing factors, including the noise to be generated. The Region's consideration of the state's noise limitations in no way forecloses or impinges upon the state's later approval process.

³⁹ In the Remand Order, the Board also erroneously referred to the 10 dB(A)-above-ambient-limitation as a Massachusetts noise *regulation*. *See, e.g.,* Remand Order at 287.

Additionally, in reevaluating the noise issue on remand, the Region determined that BPS was generally correct in its assertion that the Massachusetts policy intends the term “ambient noise” to exclude the noise emanating from the existing facility. *Id.* at 50-51. The Region explained, however, that the Massachusetts DEP employs its policy limit flexibly, on a case-by-case basis. *Id.* at 51. In particular, when reviewing proposals to add new sources of sound to long-standing, *existing* facilities, Massachusetts DEP does not apply its regulations through a strict application of the 10 dBA-above-ambient guideline. *Id.* at 53-54. With respect to this particular petition, Massachusetts has indicated, for example, that it would take into account the fact that BPS had been in continuous operation since 1963 and has been a continuous source of sound emissions in the area since that time. *Id.* at 53-54. As such, the noise from the existing facility would be considered, in this case, to be part of the ambient noise. Thus, even though EPA originally misunderstood the policy’s intended use of the term “ambient,” the misinterpretation had no practical effect on the Region’s ultimate conclusion that closed-cycle cooling at BPS is not likely to violate Massachusetts noise regulations.⁴⁰

Finally, the Region consulted the Massachusetts DEP concerning its reevaluation of the potential noise impacts of closed-cycle cooling at BPA and its assessment with respect to Massachusetts regulations. The Massachusetts DEP confirmed that: (1) the Determination on Remand and the Addendum to Noise Impact Assessment accurately describe how the Massachusetts DEP applies its noise regulations; and (2) BPS can be converted to closed-cycle cooling while likely complying with Massachusetts DEP’s noise regulations. Amicus Br. of Mass. DEP in Supp. of Remand Det. Issued by Region 1 (“Mass. Amicus Br.”) at 5 & ex. A (Concurrence Letter from Massachusetts DEP to Region 1 (Nov. 29, 2006)). Given all of the above, the Region confirmed its original conclusion that BPS can be converted entirely to closed-cycle cooling and likely will not violate any Massachusetts noise regulations. Determination on Remand at 46, 56.

Our review of the record and consideration of the briefs filed in this case leads inescapably to the conclusion that the Region’s consideration of noise im-

⁴⁰ Moreover, even though the 10 dB(A)-above-ambient limitation constitutes a guideline that would likely not be strictly applied by the Massachusetts DEP, The Region reevaluated the noise impact (taking into account the estimated noise levels from the existing power plant, the new air pollution control equipment, and the cooling towers) against an estimated “ambient” that excludes sound from the long-existing power plant. Determination on Remand at 55; Tetra Tech Inc., Addendum to Noise Impact Assessment at 9-10 (Nov. 20, 2006) (AR 4005) (“Addendum to Noise Impact Assessment”) at 9-10. An estimated ambient measurement was used because an actual measurement could not be obtained, given that the plant runs virtually continuously and is at least slightly audible throughout the area. Addendum to Noise Impact Assessment at 8. The reanalysis resulted in the conclusion that the increase in sound would still be within the 10 dB(A)-above-ambient limitation contained in the Massachusetts DEP guidance document. Determination on Remand at 55; *see also* Addendum to Noise Impact Assessment at 11.

pacts was reasonable and that the imposition of closed-cycle cooling likely will not result in an irreconcilable conflict with the Massachusetts noise regulations. In any event, BPS has not meaningfully contested this determination on appeal and, thus, we find no error in the Region's determination.

2. Consistency with EPA Guidance on Noise Levels

Rather than challenging the Region's Determination on Remand with respect to the Massachusetts noise limitations, BPS raises a separate issue in this second Petition for Review: Whether the Region has demonstrated that the imposition of closed-cycle cooling at BPS is likely to comply with EPA's own guidance on noise.⁴¹ Pet. for Rev. at 16. Although BPS raised this issue in comments on the Draft Permit,⁴² BPS did not raise, and therefore effectively abandoned, this issue in the first Petition for Review. See *supra* note 35 (quoting in its entirety BPS's argument with respect to noise). We have previously held that a petitioner may not raise, for the first time, in a second petition, arguments that should have been raised in an original petition. See *In re Carlota Copper Co.*, 11 E.A.D. 692, 734-35 (EAB 2004) (rejecting an issue raised for the first time, in a second petition, that could have been raised in the first petition but was not); *In re Knauf Fiber Glass, GmbH*, 9 E.A.D. 1, 7 (EAB 2000) (rejecting issues raised on appeal after remand that should have been raised in the initial appeal); cf. *In re Knauf Fiber Glass, GmbH*, 8 E.A.D. 121, 126 n.9 (EAB 1999) (new issues raised in reply briefs are equivalent to late-filed appeals and must be denied as untimely). To allow a petitioner to do so would effectively permit the petitioner to amend an otherwise inadequate petition. See *Carlota Copper*, 11 E.A.D. at 735. Absent compelling reasons, the Board rejects such issues. See *id.*

BPS provides no explanation for why these arguments were not previously raised.⁴³ Nor has our review of the record revealed any such justification. The Region explained, in its Responses to Comments on the Draft Permit, that there

⁴¹ The guidance document to which BPS refers is one entitled "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety." U.S. EPA, Doc. No. 550/9-74-004 (Mar. 1974) [hereinafter EPA Noise Levels Document]; see also Pet. for Rev. at 16 (citing EPA Noise Levels Document). That document identifies certain sound levels that are described as "points of departure" for state and local (as well as federal) decisionmakers; the document also specifically states that the levels identified are not intended to be federal noise standards. See EPA Noise Levels Document at 3-4, 8.

⁴² BPS stated that "[t]he noise produced by [the proposed cooling water intake] system would * * * likely exceed EPA's guidance that residential areas not be exposed to continuous noise at levels above 51 dBA." BPS Comments on Draft NPDES Permit No. MA 0003654, at 43 & vol.2, tab 13 at 3 (Oct. 4, 2002) (AR 3263).

⁴³ Even after the Region argued, in its response to BPS's Petition, that this issue was not preserved for review, Resp. to Pet. for Rev. at 64-65, BPS provided no explanation for not raising the issue in its prior appeal. See *generally* Pet'r Reply Br. (Apr. 6, 2007).

are no federally applicable noise standards. Responses to Comments at IV-83 to -84. The Region then went on to consider the EPA Noise Levels Document in its Noise Impact Analysis and concluded that the noise levels identified in that document would not be exceeded. Responses to Comments app. L. at 3, 5. Certainly BPS could have challenged the Region's determination that no federal standards were applicable, as well as the Region's analysis and conclusions concerning the noise levels in the guidance. Because we find no compelling reason justifying BPS's failure to raise these issues in its first Petition for Review, we reject BPS's attempt to do so here as untimely. *See* Remand Order at 293-94 (specifically limiting the subject matter of any post-remand appeal to the issues specifically remanded to the Region, which itself was similarly limited to responding to concerns raised in the appeal).

We note for clarity that it is of no consequence that the Region again considered the EPA Noise Levels Document on remand only to conclude, again, that the EPA-identified levels likely would not be exceeded. In the Determination on Remand, the Region noted that BPS had not raised any issues related to the EPA guidance on noise levels in the first Petition for Review. Determination on Remand at 56. The Region also observed that the Board's Remand Order did not require that EPA noise levels be addressed on remand. *Id.* Nevertheless, the Region went on to reevaluate whether closed-cycle cooling at BPS would likely exceed the EPA-identified noise levels. *Id.* at 56-57. In doing so, the Region clearly went beyond the scope of remand.

Our prior decision in this case was final as to all issues associated with the permit except those specifically identified in the Remand Order. Remand Order at 293; *see also, e.g., Knauf Fiber Glass, GmbH*, 9 E.A.D. at 7 (explaining that the Board's first decision denying review of some issues, but remanding two others, was final as to the issues not specifically remanded). With respect to the noise issue, we remanded the permit to the Region to revise its Noise Impact Analysis specifically to "address[] the concerns raised by [BPS] on appeal." Remand Order at 294. As already explained, BPS did not raise any concern with respect to compliance with the EPA guidance in its first appeal. Therefore, that issue was not included in the scope of remand. Moreover, the Region is not free, in the context of a remand, to expand the scope of the remand proceedings by reopening issues already decided (in this case, whether EPA's noise guidance levels preclude a finding that closed-cycle cooling technology is the best technology available). Thus, we agree with the Region that the appropriate remedy in this case is to strike the Region's discussion of EPA guidance levels for noise. *See* Resp. to Pet. for Rev. at 66 n.50. Accordingly, we hold that section IV.B.3.c of the Determination on Remand and the portions of the Addendum to Noise Impact Assessment that refer to EPA Noise Levels Information Document are stricken from the record, and we reject any appeal as to those portions of the analysis.

D. *The Region's Consideration of Production Foregone*

The phrase “production foregone” refers to a calculation that the Region considered in assessing the biological impact of the current cooling water intake system at BPS, as well as the potential biological impacts of various technological alternatives to the current system, to ultimately determine which technology would be the “best” for “minimizing adverse environmental impact.”⁴⁴ The calculation represents an estimate of the total quantity of fish that might exist but for the loss of forage fish⁴⁵ due to entrainment⁴⁶ or impingement⁴⁷ at BPS. *See* Resp. to Pet. for Rev. at 70; *see also* Remand Order at 153 n.180 (citing Determinations Document at 7-123). The Region considered the production foregone, along with estimates of actual losses⁴⁸ of forage and other species of fish due to entrainment and impingement, under current operations as well as under each of the various alternative technologies considered. Ultimately, the technology that entrained and impinged the least – closed-cycle cooling – was determined to be the best technology for minimizing adverse environmental impact. Determinations Document at 7-128. The Region then considered whether the cost of the “best” technology was “wholly disproportionate” to the environmental benefits gained. Resp. to Pet. for Rev. at 70; *see also* Determinations Document at 7-127, -136 to -139, -166; Responses to Comments ex. 2 at IV-47; Remand Order at 153. In the course of assessing the benefits gained, the Region employed a number of analyses, one of which was an economic assessment that monetized the value of the production foregone. *See* Determinations Document at 7-134 to -140. The Region ultimately concluded that the benefits of closed-cycle cooling far outweighed the costs. *Id.* at 7-180.

⁴⁴ As discussed in Part III.C, above, CWA section 316(b) requires EPA to set standards for the capacity of cooling water intake structures that reflect the “best technology available for minimizing adverse environmental impact.” 33 U.S.C. § 1326(b).

⁴⁵ “Forage fish” are species that are not fished on a commercial or recreational basis, but instead serve as a critical component of the food chain for predatory fish that are commercially valuable. Determinations Document at 7-123, -137, -139.

⁴⁶ Entrainment occurs when fish eggs, larvae, and other organisms (including fish) small enough to fit through the protective mesh screens are drawn into the plant cooling system with the cooling water intake flow. *See* Determinations Document at 7-110. The accompanying stress and heat prevent survival. *Id.*

⁴⁷ Impingement of fish occurs when fish, too large to pass through the protective intake screens but unable to swim away, become trapped against the screens or other parts of the cooling water intake structure. *See* Determinations Document at 7-103.

⁴⁸ The Region’s estimates concerning the actual number of fish entrained or impinged annually due to the cooling water intake at BPS are not at issue in this Petition.

1. *The Task on Remand: Adding the Region's Re-Analysis to the Record*

In its first Petition for Review, BPS argued that the Region had acknowledged significant errors in its production foregone calculations but then nonetheless had relied on those erroneous calculations in the final analysis of the permit. First Pet. for Rev. at 45. In response, the Region acknowledged certain initial errors, denied that those errors were significant, and explained that it had in fact re-analyzed the data for the Final Permit and determined that the practical effect of any error in calculating the production foregone was insignificant with respect to the overall benefits assessment. *See* Resp. to First Pet. for Rev. at 135; *see also* Remand Order at 267 (citing Responses to Comments at IV-47); Responses to Comments vol. II, app. X, at 2.

After fully considering the issue, the Board determined that the Region's inaccurate citation to the erroneous calculations in the response to comments document did not constitute clear error. Remand Order at 268. The Board also noted the "questionable importance of [the re-analysis] to the Region's overall benefits analysis." *Id.* Nevertheless, because the Region indicated that it had re-analyzed the data and had relied on that re-analysis in developing the Final Permit, the Board determined that the "re-analysis" properly should be part of the administrative record. *Id.* Thus, the Board instructed the Region to add the "re-analysis" document to the administrative record. *Id.*

On remand, the Region added to the record the document containing the re-analysis. Determination on Remand at 5 (noting the inadvertent failure to include in the record certain attachments – containing text and data regarding the production foregone re-analysis – to an existing record document and adding them as "AR 4020"). In response to this Petition, the Region indicated that the "missing attachment[s]" concerning the re-analysis had actually been part of the record all along. Resp. to Pet. for Rev. at 71 (explaining that the attachments had been misfiled as separate appendices (V and W) to the Responses to Comments document). Additionally, in response to BPS's contention in this Petition that the "re-analysis" document was insufficiently detailed, the Region placed in the administrative record the "production foregone numbers" and other data underlying the re-analysis. *See* Pet. for Rev. at 18; Resp. to Pet. for Rev. at 72 (referencing AR 4068 and Ex. R15). Based on the foregoing, the Board finds that any deficiency in the administrative record with respect to the production foregone calculations has been corrected and the Region has complied with the Remand Order in this regard.

2. BPS's Substantive Challenge Based on the Underlying Production Foregone Calculations

In addition to arguing that the Region made significant errors that it failed to correct in the Final Permit issuance, in this second Petition for Review BPS argues that the erroneous production foregone calculations go to “the very foundation of the permit” and that “if the Region’s original estimate of production foregone is significantly overstated, then * * * the Permit limits under [section] 316(b) are unnecessarily stringent.” Pet. for Rev. at 1-2. BPS contends that the Region’s newly produced calculations do not correct the significant errors that it originally raised and asserts that the actual production foregone as a result of BPS’s current operations is approximately 215,000 pounds per year, as opposed to the 51.5 million pounds per year calculated by the Region.⁴⁹ See Reply Br. at 11-13 & ex. 1, at 7). BPS points out that the Region’s selected technology – closed-cycle cooling – was anticipated to reduce the production foregone to approximately three million pounds per year. BPS then contends that “[i]f the impact of Brayton Point Station’s *current* operations is a small fraction of the [level of impact projected to be achieved using closed-cycle cooling, which the Region found acceptable], then there is no basis in the record for imposing additional burdensome and stringent limitations on its cooling water intake.” *Id.* at 11, 13 (emphasis added).

The Region contends that this substantive challenge to the production foregone calculation goes beyond the scope of remand. Reply Br. at 75. However, in its surreply, the Region admits that it overestimated the production foregone and further acknowledges that recalculation would yield a “substantially lower” number, “possibly close” to BPS’s estimate.⁵⁰ Surreply at 8. Nevertheless, the Region

⁴⁹ The specific production foregone numbers to which BPS has referred in its various briefs submitted to the Board have varied slightly. In comments on the Draft Permit, BPS estimated the production foregone of its proposed operating scenario would be 185,000 pounds, in contrast to the Region’s estimate of 54 million pounds. BPS Comments on Draft NPDES Permit No. MA 0003654, at 43 & vol. 2, tab 11 at 11-8 to 11-9 (Oct. 4, 2002) (AR 3263). In its first Petition for Review, BPS argued that the production foregone under its proposed operating scenario would be 180,000 pounds. First Pet. for Rev. at 45. In this second Petition for Review, BPS again referred to 185,000 pounds as the estimated production foregone under the proposed operating scenario. Pet. for Rev. at 17. The 215,000 pounds referred to above and in BPS’s reply brief reflects the production foregone as a result of *current* operations rather than of the proposed operating scenario. Pet’r Reply Br. at 12.

⁵⁰ The Region’s original estimate of production foregone using BPS’s proposed operating scenario was 54 million pounds. Determinations Document at 7-125. The Region’s re-analysis of that calculation resulted in a reduction of the estimate to 40 million pounds. Resp. to Pet. for Rev. app. A at 2 & ex. R15, tbl.2. (The 51.4 million pounds to which BPS refers in its Reply Brief is based on the Region’s re-analysis and *current* operations at BPS). In its surreply, however, as described above, the Region has acknowledged errors that, if corrected, would yield a production foregone calculation that is “substantially lower” and “possibly close” to BPS’s estimate of 185,000 pounds, using the proposed operating scenario.

argues that the production foregone calculations were immaterial to the overall permit analysis and any error was, therefore, harmless. Surreply at 7-10; *see also* Reply Br. at 73-76.

a. *BPS's Substantive Argument Goes Beyond the Scope of Remand*

Putting aside for a moment the significance of the production foregone calculation, BPS's substantive argument amounts to a renewed attack on the Region's overall analysis and the ultimate conclusion that closed-cycle cooling represents the best technology available for BPS. The Board previously considered BPS's complaint that the Region had acknowledged errors in the production foregone analysis, but had not corrected those errors in the Final Permit analysis, and determined that this was not "clear error." Remand Order at 267-68. The Board noted the questionable importance of the production foregone re-analysis, given the implication by the Region and its consultants that it contained little change in the overall benefits values as presented in the Determinations Document. In addition, separate and apart from the production foregone issue raised by BPS in its first Petition for Review, the Board considered and rejected various arguments advanced by BPS concerning the underlying factual basis for the cooling water intake limits. Specifically, BPS challenged the Region's selection and use of data in reaching its conclusions regarding the state of current fish populations and the biological impact of BPS on Mount Hope Bay.⁵¹ *See* First Pet. for Rev. at 39-44; Pet'r Suppl. Br. at 26-31. The Board clearly rejected each of these arguments and, in so doing, upheld the Region's biological impact assessment. Remand Order at 204-13 (addressing BPS's argument that the Region's fish population and impact estimates were demonstrably erroneous, among others).

As noted previously, in Part III.C.2, our prior decision in this case was final as to all issues associated with the Final Permit except those specifically identified in the Remand Order. Remand Order at 293; *see also, e.g., In re Knauf Fiber Glass, GmbH*, 9 E.A.D. 1, 7 (EAB 2000). This includes the question of whether the Region's selection of closed-cycle cooling as the best technology available pursuant to CWA section 316(b) was adequately supported. Remand Order at 204-71. With respect to the production foregone, the Remand Order, as described above, simply directed the Region to add its re-analysis to the record, and the Region has done so. Thus, BPS's substantive argument with respect to the production foregone calculation goes beyond the scope of the remand and seeks to reopen issues already decided.

⁵¹ As further articulated below, the challenged data and conclusions were not dependent upon, and would not be affected by, any change in the production foregone numbers. *See infra* Part III.D.2.b.

Nevertheless, because the Region now acknowledges a “significant overestimate” in its calculation of the production foregone and states that “recalculation would yield a substantially lower total production foregone estimate, possibly close to [BPS’s] figure,” we will examine the Region’s alternative argument in an effort to be thorough in our review of the permit conditions. Thus, we consider next whether the production foregone calculation was immaterial to the overall analysis, rendering any error in that calculation harmless.

b. Any Error in Calculation of Production Foregone Was Harmless

The Board typically declines to review errors that have no bearing on the ultimate conclusion by the permit issuer. *In re Steel Dynamics, Inc.*, 9 E.A.D. 740, 749 (EAB 2001) (concluding that allegedly erroneous analogy used to justify agency’s reliance on data from certain sources in making its permitting decision was harmless where the agency had articulated other legitimate bases for relying on data from those sources); *In re Old Dominion Elec. Coop.*, 3 E.A.D. 779, 780-82 (Adm’r 1992) (reliance on invalid reasoning is harmless error where permit issuer also relied on other reasonable grounds for decision); *In re Spokane Reg’l Waste-to-Energy*, 2 E.A.D. 809, 815 (CJO 1989) (failure on the part of the permit issuer to consider an alternate technology was harmless error where no such consideration was required and would only serve to satisfy academic concerns, but would have no effect on the outcome). Thus, if the role of the production foregone calculation was so insignificant to the Region’s overall analysis that the ultimate result – selection of closed-cycle cooling as the best technology available for BPS – would remain unchanged regardless of an error in that calculation, then any such error would be harmless.

To better understand the limited role the production foregone calculation played in the Region’s analysis, it is useful to place that calculation into context. As we have noted previously, CWA section 316(b) requires EPA to ensure that the location, design, construction, and capacity of cooling water intake structures reflect the *best technology available* for minimizing adverse environmental impact. In determining the best technology available, the Region considers engineering issues, environmental/ecological issues, economic issues related to the costs of implementing various technological options, legal issues, and, ultimately, policy issues regarding the final choice of what level of expenditure is appropriate in seeking to minimize adverse environmental effects. Determinations Document at 7-1. Thus, as part of the Region’s analysis of the appropriate cooling water intake structure requirements to be imposed on BPS, the Region considered what the biological impacts of BPS, as currently operated, are.

In assessing the biological impacts, the Region looked at production foregone modeling. Production foregone was not, however, the only factor, or even the primary factor, examined. Our review of the record reveals that, in assessing

the adverse effects on the Mount Hope Bay ecosystem, the Region relied significantly on its data concerning the collapse of fish populations, absolute levels of impingement and entrainment,⁵² and data concerning effects on winter flounder populations and other populations of fish species. *See, e.g.*, Determinations Document at 7-102 to -130; Responses to Comments, ex. 2, at IV-21 to -23, -41 to -43; Remand Order at 153-55, 204-13. As noted previously, in its first Petition for Review, BPS challenged various aspects of the Region's selection and use of data in assessing biological impacts, and the Board rejected each of these arguments. *See* First Pet. for Rev. at 39-44; Remand Order at 204-13. Based on evidence of the collapse of fish populations and the absolute levels of entrainment and impingement of fish at BPS, but also taking into account the production foregone, the Region concluded that the losses from entrainment and impingement at BPS constituted "severe adverse environmental impacts" and that those losses have "significantly contributed to the collapse of the overall indigenous community of fish in Mount Hope Bay and prevention of the recovery of that assemblage of organisms to a healthy condition." Determinations Document at 7-125. Importantly, the assessment of the most significant data was not dependent on the production foregone calculation and would not be affected by changes to that calculation. *See id.*; *see also* Resp. to Pet. for Rev. at 75. The Region further concluded that, "in order to give the Mount Hope Bay ecosystem a chance to recover, the [rate of] entrainment and impingement by [BPS] must be dramatically reduced." Determinations Document at 7-126. Based on our review of the record, we find that the Region's conclusions regarding the biological impact at BPS are wholly supported, irrespective of the production foregone estimate.

The Region also evaluated how the biological impact of BPS would change with the implementation of each of four alternative technologies.⁵³ The Region determined that greater reductions in cooling water intake would result in proportionately greater reductions in entrainment and impingement. So, for example, the Region estimated that the Permittee's preferred Enhanced Multi-Mode alternative would reduce intake flow by 33%, and the closed-cycle cooling alternative would reduce intake flow by 96%. The absolute levels of entrainment and impingement, adult fish losses, and winter flounder population losses for each technological alternative considered were correspondingly decreased relative to the reduction in intake flow. The amount of production foregone was similarly adjusted downward based on the reduced intake flow rate achieved. Thus, closed-cycle cooling – the technology with the lowest limit on intake flow – was determined to be the technological option with the least biological impact. Again, this would be true re-

⁵² The Region extrapolated data collected on actual rates of impingement and entrainment to derive annual impingement and entrainment losses at BPS. *See* Determinations Document at 7-106, -112.

⁵³ Alternatives considered other than closed-cycle cooling included the "Enhanced Multi-Mode" (BPS's preferred alternative) and two others. *See* Determinations Document at 7-127.

ardless what the level of production foregone is. The Region determined that in order to give Mount Hope Bay a chance to recover, the technology with the least impact constituted the best technology for minimizing environmental impact.

Notably, BPS does not dispute that closed-cycle cooling will have the least biological impact. Rather, BPS seems to assert that current levels of production foregone are acceptable because they are below the production foregone levels that the Region projected could be achieved by converting to closed-cycle cooling. Reply Br. at 11, 13. In so arguing, BPS ignores the data concerning the collapse of fish populations, the absolute levels of entrainment and impingement, and all other data supporting the Region's conclusion that current operations at BPS are having severe adverse environmental impacts on Mount Hope Bay. Moreover, it bears repeating here that the statute requires that the Region's capacity limits reflect "the *best* technology available for *minimizing* adverse environmental impact." 33 U.S.C. § 1326(b) (emphases added). The statute does not require the Region to determine "acceptable" levels of impact.

Next, the Region considered whether the cost of converting to closed-cycle cooling would be wholly disproportionate to the benefits received. The Region's approach to considering costs and benefits and the use of the wholly disproportionate test were upheld in the Remand Order. *See* Remand Order at 226-33, 271. In evaluating the benefits received, the Region considered both qualitative and quantitative aspects.

Qualitatively, the Region considered the public benefits of implementing closed-cycle cooling to be highly significant. Determinations Document at 7-131. Specifically, the Region concluded that closed-cycle cooling was the only option likely to decrease the intake flow significantly enough to give the collapsed Mount Hope Bay fishery a reasonable chance to recover over time, which, the Region noted, is consistent with the central objective of the Clean Water Act "to restore and maintain the chemical, physical, and biological integrity of the nation's waters." 33 U.S.C. § 1251(a); *see also* Determinations Document at 7-131. The Region discussed at length the public importance of restoring the biological integrity of the Mount Hope Bay ecosystem and noted that a very major reduction in the plant's cooling water flow – such as that provided by closed-cycle cooling – is a threshold requirement for recovery. Determinations Document at 7-130 to -134.

For its quantitative analysis, the Region attempted to "roughly estimate" the monetary values of the biological and/or ecological benefits of closed-cycle cooling. In so doing, the Region noted the inherent difficulty in accurately or fully valuing resources or environmental quality in monetary terms, in part because not all environmental services, amenities, or values are traded in markets. *Id.* at 7-135. Thus, direct observation of the values the public assigns to these resources is not possible. *Id.* Nevertheless, the Region employed several methods to "mone-

tize” the benefits, one of which was a “benefits transfer analysis”⁵⁴ that tried to capture the values of all of the benefits derived, including: 1) direct use values (what the fish saved would be worth at market); 2) indirect use values (the monetary value of species of fish that are not themselves commercially valuable but support the propagation of other species); 3) non-use values (the “existence value,” which represents the value people receive from knowing that healthy fish populations are being conserved); and 4) bequest value (which represents the value that people place on knowing fish have been preserved for future generations). To compute the use values, the Region measured and took into account the recreational and commercial values of the fish, in addition to the forage value (the value of fish that are not fished, but provide support for fish that are).

Of particular relevance to this discussion is the forage value. The Region analyzed this value in two separate ways, one of which involved utilizing a production foregone approach.⁵⁵ See Determinations Document at 7-139. This approach presumed that forage fish have value only to the extent to which they contribute to the production of other species of fish that have recreational or commercial value (ignoring a variety of other ecological benefits they might also provide). The production foregone value was derived by estimating the loss of commercial and recreational species that would result from the loss of the forage species. *Id.*

Ultimately, the forage value (i.e., the production foregone value) estimates ranged from \$3,454 to \$4,951. This range of value represented an insignificant and immaterial portion of the total range of monetary value that the Region attributed to closed-cycle cooling. To illustrate, the range of total economic value from the benefits transfer analysis, alone, was \$178,293 to \$250,890 annually. Determinations Document at 7-142. Moreover, other methods of valuing the benefits resulted in monetary ranges from \$17.7 to \$58.1 million dollars annually for per-person non-use regional values, and from \$53.3 to \$195.6 million annually for per-person non-use national estimates. Yet another method of quantitative analysis – the valuation of habitat replacement costs – resulted in a monetary range

⁵⁴ Because the Region doubted whether the benefits transfer analysis provided a complete assessment of the total value of the fish resources that could be saved by cooling water flow reduction at BPS, the Region also conducted a per-person recreational and non-use benefit value analysis (which estimated recreational user benefits from an increased catch rate based on improvement in impact area and non-use benefits from improved protection of aquatic resources in impact area), and a “habitat restoration cost” analysis (which sought to identify the cost of habitat restoration efforts sufficient to replace the same number of fish of each species lost to impingement and entrainment by BPS intake). Determinations Document at 7-145 to -150. The Region also considered BPS’s own monetary assessment of benefits, as well as an assessment conducted by the Rhode Island Department of Environmental Management. Determinations Document at 7-160 to -162.

⁵⁵ The other method used to derive the forage fish value was to assess the cost of replacing the forage fish. Determinations Document at 7-140.

from \$873,400 to \$27.7 million annually. In context, it is clear that the value of the production foregone (which, again, ranged from \$3,454 to \$4,951) played an insignificant role in the quantitative benefits analysis. *See* Determinations Document 7-134 to -158. Moreover, given the difficulty of accurately or fully valuing natural resources or environmental quality in monetary terms in the first place, and the associated emphasis on the qualitative assessment, it is clear that the production foregone value was trivial to the Region's overall benefits assessment. *See* Determinations Document 7-126 to -162; *see also* Remand Order at 268 (noting the "questionable importance" of the production foregone re-analysis to the Region's "overall benefits analysis").

Thus, the Board finds that whatever the estimated level of production foregone (be it the Region's newly produced numbers, BPS's numbers, or somewhere in between), the Region's conclusion that closed-cycle cooling is the best technology available would remain the same and would remain adequately supported. Because the production foregone calculation had no bearing on the Region's ultimate determination that the costs of closed-cycle cooling constituted the best technology available for BPS, any error in calculating the production foregone was harmless. *See In re Steel Dynamics, Inc.*, 9 E.A.D. 740, 749 (EAB 2001) (concluding that allegedly erroneous analogy used to justify agency's reliance on data from certain sources in making its permitting decision was harmless where the agency had articulated other legitimate bases for relying on data from those sources). Further, because any error was harmless, BPS has failed to identify any basis that would support further Board review of the production foregone calculation, even if the Board were to consider issues that go beyond the scope of the Remand Order.

IV. CONCLUSION

For all of the reasons stated above, we deny BPS's Petition for Review.

So ordered.