Section IX Requirements Proposed for Cooling Water Intake Structures

For the Final Permit, EPA has significantly revised the cooling water intake structure (CWIS) requirements proposed in the Draft Permit. These revisions have been made as a result of EPA's re-assessment of these proposed requirements in light of public comments and subsequent legal developments. EPA received a variety of public comments concerning the Draft Permit's CWIS limits and EPA responds to these comments below, while also explaining, in accordance with 40 C.F.R. § 124.17(a)(1), the provisions of the Final Permit related to CWISs that have been revised from the Draft Permit.

Section IX.A

Comment IX.A: Overall comments regarding § 316(b) permit requirements and their derivation

EPA received a number of conflicting comments touching on the Draft Permit's proposed cooling water intake requirements under CWA § 316(b). These comments address a range of issues, including the biological effect of Canal Station's cooling water withdrawals, the proper relationship of EPA's CWA § 316(b) "Phase II" Rule to the development of limits for the Canal Station permit, and the evaluation of alternative technologies for meeting the BTA standard under § 316(b) at Canal Station. Immediately below EPA describes and responds to comments by Mirant and by several federal and state natural resource protection agencies. These comments conflict in various respects but are discussed together here to facilitate EPA providing a coherent, coordinated response.

1. Mirant's Comments

EPA quotes Mirant's comments below:

> Although NPDES permits typically cover only discharges of pollutants to waters of the United States, the Clean Water Act also includes a unique provision, § 316(b), that applies to "cooling water intake structures." Section 316(b), 33 U.S.C. § 1326(b), provides:
>
> > Any standards established pursuant to section 1311 of this title or section 1316 of this title and applicable to a point source shall require that the location, design, construction and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.
>
> On July 9, 2004, EPA issued regulations governing implementation of § 316(b) for existing power plants such as Canal Station. Those regulations, sometimes referred to as the "Phase II Rules," became effective on September 7, 2004. 69 Fed. Reg. 42577 (July 9, 2004). Prior to establishment of those regulations, § 316(b) was implemented by permit-writers case-by-case. Now, these regulations displace that purely case-by-case

approach, establishing performance standards for reducing impingement mortality and entrainment, and providing a uniform national process by which permittees will develop and use relevant data and information to select from among various compliance alternatives for achieving those standards, or alternative standards set pursuant to the regulation.

Part I.A.8.a., b, and c of the Draft Permit require Mirant Canal to submit reports or other information required by the new § 316(b) regulations. Part I.A.8.a requires the Company to submit, as expeditiously as practicable but not later than October 7, 2006, a Proposal for Information Collection ("PIC") required by 40 C.F.R. § 125.95(b)(1) of the § 316(b). The PIC must include a description of the information that will be used to support the Comprehensive Demonstration Study ("CDS") required by 40 C.F.R. § 125.95. Part I.A.8.b of the Draft Permit requires Mirant Canal to submit the CDS as expeditiously as practicable, but not later than January 7, 2008. Part I.A.8.c of the Draft Permit requires the Company to submit not later than January 7, 2008 the information required by 40 C.F.R. §§ 122.21(r)(2), (3), and (5).
Mirant Canal agrees that these reports are required by the § 316(b) regulations, and the Company already has begun work on those reports. The Draft Permit does not stop with those requirements, however. Instead, in Parts I.A.9, 10,11,12,13, and 14, it continues, imposing a host of additional monitoring and reporting requirements, as well as extensive structural changes to the existing cooling water intake structures. These include:

- Extensive biological studies of the occurrence and abundance of entrained fish
- Extensive biological studies of the occurrence and abundance of impinged fish
- Annual submission of a biological monitoring report
- Development of a Marine Mammals Monitoring Program and Response Protocol
- Broad provisions for inspections and reporting related to "discharge-related" mortality
- Provisions for reporting of unusual impingement events
- A requirement that the Station remove sediment build-up on the Unit 2 intake sill within six (6) weeks after the effective date of the permit, and continue to do so periodically
- Requirements to retrofit the cooling water intake structure by
  - equipping the screens with fish holding buckets
  - installing and operating a low pressure spray wash
  - relocating the cooling water chlorine injection from in front of the intake screens to a point at which impinged organisms will not be exposed to chlorine prior to and during impingement
  - substantially reconfiguring the fish return system
- A requirement that, after completion of the reconfigured fish return system, Canal Station operate all screens continuously when the corresponding intake pumps are in operation.

These requirements far exceed EPA's regulatory authority under the Phase II Rules, circumventing the step-wise process EPA put in place to ensure that permittees have an opportunity to select compliance alternatives and design "technology installation and operation plans" ("TIOPs") that will comply with the applicable performance standards. For the reasons discussed in the following sections, Mirant Canal believes that imposition of § 316(b)-related requirements beyond those in Part I.A.8 are neither legally justified nor warranted as a practical or environmental matter. Imposing such requirements, when they are or may prove to be inconsistent with the results of the PIC/CDS process would be arbitrary and capricious, especially given the fairly short period of time involved until those reports are complete.

EPA's final Phase II Rule sets national performance standards for reduction of impingement mortality and, for some plants, entrainment. 40 C.F.R. § 125.94(b), 69 Fed. Reg. 41,686. The impingement standards apply to all existing power plants subject to the Phase II Rule. The entrainment standards apply only to power plants that: (1) have a capacity utilization rate of 15% or greater, and (2) withdraw water from either (a) a tidal river, estuary, ocean, or the Great Lakes, or (b) withdraw more than 5% of the mean annual flow of a freshwater river or stream.

The performance standards require a reduction compared to a "calculation baseline" of (1) between 80-95% in impingement mortality, and (2) between 60-90% in entrainment. The "calculation baseline" reflects the amount of impingement mortality and entrainment that would occur at the site if the facility had a shoreline intake structure, flush with the surface, with 3/8 inch mesh traveling screens, and no fish protection of any kind.

The Rule specifically provides that permittees will have substantial flexibility to evaluate and choose among five compliance options for achieving these performance standards. 40 C.F.R. § 125.94(a), 69 Fed. Reg. 42,685. For Canal Station, the most relevant options may include:

> (b) installing, and properly operating and maintaining other design and construction technologies, operational measures, or restoration measures that will achieve the applicable performance standards (§ 125.94(a)(3)); and
> (d) demonstrating that a less stringent alternative performance standard is necessary because the cost of achieving the performance standard at the site exceeds either the cost EPA considered for the site during the rulemaking or the benefits of achieving the standard(s) at the site (§ 125.94(a)(5)).

The Phase II Rule contemplates that permittees will have an opportunity to evaluate their compliance options and demonstrate compliance using the most cost-effective option or options. 69 Fed Reg. 41,576, 41,583 (July 9, 2004). The Rule also requires collection and submission of certain types of data and information, which vary depending on the option selected. For example, permittees who wish to demonstrate compliance using restoration must show that they meet certain pre-requisites (i.e., that technology alternatives or operational measures are less feasible, less cost-effective, or less environmentally desirable) and must prepare a Restoration Plan. 40 C.F.R. §

125.95(b)(5), 69 Fed. Reg. 41,689 (July 9, 2004). Permittees who wish to request alternative, site-specific limits must submit a Comprehensive Cost Evaluation Study, a Site-specific Technology Plan, and, if alternate limits are based on the cost-benefit test, a Benefit Valuation Study. 40 C.F.R. § 125.95(b)(6), 69 Fed. Reg. 41,689 (July 9, 2004). In short, an opportunity to select among performance options must precede and inform data collection efforts required by the Phase II Rule.

The Phase II Rule also anticipates that, for certain compliance options, including options based on design and construction technologies, the permittee will develop a TIOP tailored to the option or options it has chosen. 40 C.F.R.§ 125.95(b)(4)(ii), 69 Fed. Reg. 41,689 (July 9, 2004). The permittee is entitled to request that compliance with the performance standards be assessed based on whether it has complied with its TIOP, rather than using the performance standards themselves as a direct measure of compliance. 40 C.F.R. § 125.94(d), 69 Fed. Reg. 41,686 (July 9, 2004).

By the same token, the Phase II Rule contemplates that permittees will have responsibility -- and flexibility -- in designing and collecting data necessary to evaluate and select among compliance options. The Rule specifically allows permittees to use existing data, so long as the data are representative of current conditions and were collected using appropriate quality assurance/quality control procedures. *See* 40 C.F.R. §§ 125.95(b)(1)(ii), (b)(3)(iii), 69 Fed. Reg. 41687-88. New sampling may be required only if necessary to develop a scientifically valid estimate of impingement mortality and entrainment at the site. 40 C.F.R. §125.95(b)(1)(iv).

EPA's own regulations implementing § 402(a)(1) with respect to effluent limitations guidelines enumerate the statutory factors that must be considered in writing permits. *See* 40 C.F.R. § 125.3(c), (d) (1987). See also 51 Fed. Reg. at 24915 ("In developing the BPJ permit conditions, [the EPA] Regions are required to consider a number of factors, enumerated in [33 U.S.C. § 1314 (b)]. . ."). In addition, courts reviewing permits issued on a BPJ basis hold EPA to the same factors that must be considered in establishing the national effluent limitations. *See, e.g., Trustees for Alaska v. EPA*, 749 F.2d 549, 553 (9th Cir. 1984) (EPA must consider statutorily enumerated factors in its BPJ determination of effluent limitations); *API*, 787 F.2d at 972, 976 (applying statutory factors in reviewing effluent imitations in a BPJ permit); *NRDC v. EPA*, 863 F. 2d 1420, 1425 (9th Cir. 1988); *Texas Oil & Gas Ass'n v. EPA*, 161 F.3d 923, 928 (5th Cir. 1998) ("Individual [BPJ] judgments thus take the place of uniform national guidelines, but the technology-based standard remains the same"); *NRDC v. EPA*, 859 F.2d 156, 183 (D.C. Cir. 1988) (When issuing permits according to its BPJ, EPA is required to adhere to the technology-based standards set out in § 1311(b)). In this instance, the best evidence of what the national standards for the industry as a whole would require are reflected in the Phase II Rule, the specifics of which are yet to be implemented.

With respect to EPA's analysis of the potential applicability of wet recirculating cooling at the Canal Station, Mirant Canal disagrees with EPA's statement that this alternative "remains open" as a potential means of compliance. Fact Sheet, p. 44. At a projected cost of $122.2 million, even without detailed cost-benefit analysis, the cost of this option

> is self-evidently "significantly greater" than the benefits and could not be justified under the Phase II Rule. Equally important, this option raises a number of environmental concerns, including creation of a fog bank in the area of the plant (and associated road hazards to navigation), noise impacts, aesthetics, creation of drift and solid waste, and others. Mirant Canal also notes that EPA specifically concluded, as part of its Phase II rulemaking, that retrofitting re-circulating cooling should not be used as the basis for setting BTA performance standards.
>
> We note also that EPA says with respect to this alternative that "[a]nother option that could be considered would be to provide closed-cycle cooling for some, but not all, of the plant's cooling needs." In addition to the objections noted above, which apply equally to this option, it would diminish potential entrainment and impingement benefits while not necessarily reducing the costs.

2. Comments by Federal and State Natural Resource Protection Agencies

EPA also received comments on the Draft Permit from a number of federal and state administrative agencies charged with protecting public natural resources. In the context of EPA's consultation with the National Oceanic and Atmospheric Administration (NOAA) under the Essential Fish Habitat (EFH) provisions of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the requirements of the Fish and Wildlife Conservation Act, NOAA commented in a letter dated January 18, 2006, that it was "concerned with impingement and entrainment of fishery resources due to the operation of this facility." NOAA noted that the Draft Permit would require submission of a Comprehensive Demonstration Study (CDS) to, among other things, "confirm that the technologies and operational measures" to be used at Canal Station will meet "established performance standards." NOAA stated that it required the specific information that was to be included in the CDS *before* it could adequately assess the "anticipated impacts resulting from the operation of this facility." NOAA stated that in the absence of this information, it "[did] not consider the EFH assessment complete at this time . . .[,]" and it "request[ed that] the EFH consultation for the reissuance of the Mirant Canal NPDES permit be held in abeyance until the CDS is developed and submitted to EPA." NOAA indicated that it would provide any conservation recommendations under the MSA only after its review of the information in the CDS.

On March 27, 2006, NOAA sent another letter, however, revising its earlier EFH comment letter. The newer letter reiterated NOAA's concern about the facility's entrainment and impingement but then stated:

> [i]t is currently our understanding that due to the implementation period associated with the Clean Water Act 316(b) Phase II regulations, the results of the CDS will not be available for the current draft permit review. Rather, the CDS will be utilized by EPA within the subsequent 5-year review permit cycle in order to determine the Best Technology Available (BTA) to reduce entrainment. NMFS supports efforts of EPA to reduce entrainment mortality associated with the operation of Canal Station.

Thus, *because of the Phase II Rule's provisions*, as reflected in the Draft Permit, NOAA effectively withdrew its request that the EFH consultation be held in abeyance due to the absence of required steps for entrainment reduction in the permit.

Comment letters were also submitted by the following agencies of the Commonwealth of Massachusetts.

A. The Massachusetts Division of Marine Fisheries (MA-DMF) sent a comment letter dated January 17, 2006, discussing the technological alternatives assessed in the Fact Sheet and stating that "*Marine Fisheries* supports EPA alternative 6 to retrofit the plant with a closed-cycle cooling system."

B. The Massachusetts Office of Coastal Zone Management (MA-CZM) sent a comment letter dated January 20, 2006, stating that it "would like to offer its strong support for EPA's requirement of upgrades to the Canal Station Cooling Water Intake Structure (CWIS) design."

C. The Riverways Program of the Massachusetts Department of Fish and Game (MA-Riverways) sent a comment letter dated January 20, 2006, which stated the following:

> As the Fact Sheet notes, there ha[ve] been declines in most of the fish population[s] in Massachusetts so it should be a priority to eliminate any preventable mortality for this facility. We would urge the regulators to work with fisheries managers to determine the acceptable levels of entrainment and impingement losses for this facility and provide the rationale used to arrive at the acceptable loss numbers. This information would allow the public to consider and respond to the goals set by the regulations and inform the Permittee of the target for mortality reduction. Knowing the expected reductions will be invaluable information when further assessing the selected alternatives.

Thus, MA-DMF called for closed-cycle cooling to be determined to be the BTA for Canal Station, while NOAA, MA-CZM and MA-Riverways called for improvements to reduce mortality from entrainment and impingement but, in effect, accepted that entrainment reduction requirements would only be specified and implemented later under the Phase II Rule process.

Response IX.A: Changes to Draft Permit Conditions for the Final Permit

EPA provides the following discussion to respond to the comments presented above and to explain, in accordance with 40 C.F.R. § 124.17(a)(1), the provisions of the Draft Permit developed under CWA § 316(b) that have been changed for the Final Permit.

1. Summary

For the Final Permit, EPA has significantly revised the entrainment and impingement reduction requirements that were included in the Draft Permit under CWA § 316(b). The revised permit

conditions in the Final Permit are a logical outgrowth of the Draft Permit. Neither the revised permit conditions nor the new information related to those conditions that was added to the record in response to comments raise significant new questions that would warrant the Region exercising its discretion to reopen the public comment period under 40 C.F.R. § 124.14(b). This is because:

> (a) the revised permit conditions are based on EPA's BPJ selection of a BTA option for the Final Permit that was earlier assessed on a BPJ basis in the Fact Sheet and administrative record for the Draft Permit, though it was not at that time mandated to be the BTA; and
>
> (b) EPA's modified BPJ determination of the BTA is based on EPA's reconsideration of its earlier BPJ evaluation of the options in light of:
>
> (i) EPA's consideration of public comments on the Draft Permit;
> (ii) updated EPA technical analyses in response to public comments; and
> (iii) EPA's consideration of the above in light of the Agency's suspension of the CWA § 316(b) Phase II Rule and certain legal rulings in the court decision that led to the Rule's suspension.

For the Draft Permit, EPA applied CWA § 316(b) on a BPJ basis consistent with the Phase II Rule, 40 C.F.R. § 125.95(a)(2)(ii), and as informed by the terms of the Rule. EPA evaluated numerous technologies to determine the BTA for minimizing adverse environmental impacts from Canal Station's cooling water intake structures (CWISs). Based on this analysis, the Draft Permit required specific steps for reducing the impingement mortality from the facility's CWISs. With regard to entrainment, EPA concluded that closed-cycle cooling would achieve the greatest reductions in adverse impacts and would satisfy the statute's BTA standard, but nevertheless decided that various uncertainties raised by the terms of the Phase II Rule made it inappropriate at that time to definitively determine that closed-cycle cooling was the BTA for Canal Station. Instead, the Draft Permit required (1) that the Permittee submit the information required by EPA's then applicable CWA § 316(b) Phase II Rule, *see, generally,* 40 C.F.R. Part 125 Subpart J; *see also* 40 C.F.R. § 125.95, in order to support a later determination under the Rule of specific permit requirements regarding entrainment reduction, and (2) that the Permittee implement the steps later identified as the BTA for entrainment reduction at the facility.

EPA has changed the Draft Permit's entrainment reduction-related provisions for the Final Permit. The present determination is based on EPA's BPJ application of CWA § 316(b) applied on a case-by-case basis to the facts of the Canal Station Permit and does not apply to any other facility. Further consideration of the technological options in response to public comments and in light of post-Draft Permit legal developments has led EPA to conclude, as detailed below, that closed-cycle cooling does, in fact, represent the BTA for minimizing adverse environmental impacts from the CWISs at Canal Station, and that limits reflecting this BTA should be included in the Final Permit. EPA has concluded, based on the current record in this case, that *at Canal Station* closed-cycle cooling would be the best performing technology and that other technologies are unlikely to perform as well. Therefore, the Final Permit contains entrainment reduction requirements based on the performance capability of closed-cycle cooling.

EPA has not, however, ruled out the possibility that further investigation may find that other technologies can perform comparably to closed-cycle cooling at Canal Station. Therefore, EPA has crafted Final Permit conditions that set performance standards based on the degree of entrainment reduction achievable by closed-cycle cooling, but that do not require the use of closed-cycle cooling *per se*. The Final Permit allows the use of any other technology or operational measure that can meet the stated performance standards. Specifically, the Final Permit requires entrainment reductions comparable to levels that would be achieved by using an optimized closed-cycle cooling system at Canal Station. The Permit specifies that the required entrainment reductions can be achieved with either closed-cycle cooling or some other technology, provided that if an alternative technology reduces entrainment at the expense of increased impingement mortality, then that increased impingement mortality will be considered to diminish the entrainment reduction credited to the facility.[1] The Final Permit also provides that if the final choice of an entrainment reduction technology will also reduce impingement mortality in a manner that obviates the need for the Permit's specific CWIS design requirements for reducing impingement mortality, then the Permittee may seek to modify the Permit to eliminate any superfluous requirements. Finally, the Final Permit also specifies in a "reopener" provision, that the Permittee may seek a permit modification if its further assessment of alternatives leads it to conclude that closed-cycle cooling does not represent BTA at Canal Station and that the Final Permit's resulting entrainment reduction limits should be modified.[2]

While the Final Permit requires immediate compliance with the CWIS-related limits under CWA § 316(b), EPA understands that Canal Station does not presently have the necessary environmental protection equipment in place and will, therefore, be unable to comply immediately with the Permit. Therefore, EPA expects to issue the facility an Administrative Compliance Order under CWA § 309(a) that will specify a reasonable schedule for coming into compliance with the new permit requirements. This schedule will call for the facility, among other things, to evaluate compliance options and propose a means of compliance to EPA for review and approval. This schedule will also enable the Permittee to consider whether it wishes to seek a modification of the Permit's BTA-based requirements under CWA § 316(b).

The changes in CWIS-related conditions from the Draft Permit to the Final Permit are described and explained in more detail below.

2. Permit Conditions for CWISs

CWA § 402(a) and 40 C.F.R. §§ 122.43(a) and 122.44 require that NPDES permits include limits and conditions necessary to meet applicable federal technology-based standards. Such federal technology-based standards represent the *minimum* level of pollution control that must be mandated by an NPDES permit. Permits must also impose any more stringent limits required to

[1] For example, if a screening system of some type is used to prevent entrainment by blocking organisms from being drawn into the facility's cooling system, but the formerly entrained organisms die from being impinged on the screens, then this new, resulting impingement mortality would be considered to offset the entrainment reductions achieved by the screening system.

[2] The Final Permit includes limits on cooling tower blowdown only if the permittee chooses to comply with Part I.A.13.g of the Permit by using closed-cycle cooling as the BTA to reduce the impacts of impingement and entrainment. See Part I.A.2.f of the Final Permit and response to comment III.E.

satisfy state water quality standards or other state law requirements. *See* 33 U.S.C. §§ 1311(b)(1)(C) and 1341(a)(1) and (d).

For cooling water intake structures, CWA § 316(b) imposes a technology-based standard requiring that:

> [a]ny standard established pursuant to section 301 or section 306 of this Act and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

33 U.S.C. § 1326(b). Therefore, an NPDES permit issued to a facility with CWISs should, in general, include limits that reflect the BTA for minimizing adverse environmental impacts under CWA § 316(b) and 40 C.F.R. §§ 125.90(b) and 122.43(b)(3), and that satisfy any more stringent water quality-based requirements that apply. *See* 40 C.F.R. §§ 122.4(d) and 122.44(d). *See also* 40 C.F.R. 125.84(e) (CWIS requirements for new facilities must comply with any more stringent, applicable state water quality standards).

The BTA standard requires that permit limits reflect the best technology available for minimizing the adverse impacts of CWIS operation. In most cases, the most significant of these adverse impacts are the entrainment and impingement of aquatic organisms. Minimizing these adverse impacts means to reduce them as much as possible. *See American Heritage Dictionary (2nd Ed.)* (1982) (definition of "minimize"); *Decision of the General Counsel No. 63 (In re Central Hudson Gas and Electric Corporation, et al.),* p. 371, 381 (July 29, 1977); *In the Matter of Public Service Company of New Hampshire, et al. (Seabrook Station, Units 1 and 2),* 10 Env't Rep. Cas. (BNA) 1257, 1260 (EPA June 17, 1977); *Decision of the General Counsel No. 41 (In re Brunswick Steam Electric Plant),* 197, 203 (June 1, 1976). The BTA standard also requires that the technology be "available," which means feasible from a technological and economic standpoint. Finally, the BTA standard requires that the specified technology be the "best," which, in the first instance, means that it reduces the adverse impacts of entrainment and impingement to the greatest degree. In addition, however, application of the BTA standard – as with the application of national technology standards for effluent discharge – also entails consideration of any adverse, "non-water" environmental effects and energy effects. If serious enough, these effects could provide a legitimate basis for rejecting a technology that would otherwise constitute the BTA based on its ability to reduce entrainment and impingement.

3. CWIS-Related Conditions in the Draft Permit

The CWIS conditions in the Draft Permit were developed under EPA's then effective CWA § 316(b) Phase II Rule, 40 C.F.R. Part 125, Subpart J (the Phase II Rule). (The Phase II Rule applied to existing power plants with cooling water withdrawals of fifty million gallons per day (MGD) or more.) More specifically, the Draft Permit's CWIS conditions were developed under a provision of the Phase II Rule that governed the period of transition from the prior BPJ regime

for applying § 316(b) to NPDES permits to the new Phase II Rule regime. As explained at length in the Fact Sheet, *see Fact Sheet* at 26-28, the Phase II Rule's "transition provision," 40 C.F.R. § 125.95(a)(2)(ii), provided that for permits such as Canal Station's – *i.e.*, permits that had already expired but could not yet be reissued under the Phase II Rule's substantive requirements because the necessary information to support the application of those requirements had yet to be developed – the BTA should continue to be determined on a BPJ basis and permits should include schedules for submission of the necessary information under the Phase II Rule by January 7, 2008. *Id. See also id.* at 45. EPA also explained that a variety of parties were challenging the Phase II Rule in federal court, *id.* at 25, and stated that:

> . . . if it later turns out that for some reason the Phase II Regulations are not in effect at the time this Final Permit becomes effective (*e.g.*, they have been stayed or remanded as a result of the litigation that has been filed regarding the new regulations), then the Final Permit would still have a proper BPJ-based foundation for its § 316(b) requirements.

Id. at 27.

In applying its BPJ under the auspices of the Phase II Rule, EPA also reasonably took account of the substantive terms of the Phase II Rule. As EPA explained in detail in the Fact Sheet, the Phase II Rule provided permittees with a number of compliance options. *See Fact Sheet* at 24-26. The Rule set national performance standards for reducing impingement mortality (by 80-95%) and entrainment (by 60-90%), but also allowed permittees to comply with the Rule by undertaking approved environmental restoration projects and/or seeking alternative site-specific performance standards on the grounds that the cost of meeting the national standards was significantly greater than either the benefit of doing so or the cost that EPA considered in developing the Rule. *See* 40 C.F.R. § 125.94(b)(4). In addition, the Phase II Rule set out a timetable according to which permittees were to select a preferred BTA option and develop and submit specific information to support a determination of the BTA and associated permit limits for each facility. *See Fact Sheet* at 25-26. Mirant's comments on the Draft Permit discuss various provisions of the Phase II Rule at some length, arguing that these conditions should be fully applied to Canal Station for this permit.

In developing the Draft Permit, EPA found that Canal Station's CWISs caused substantial adverse environmental impact from entrainment and impingement. The CWISs kill large numbers of fish eggs, fish larvae and juvenile and adult fish of a variety of species. In addition, the CWISs kill large numbers of "equivalent adult" fish, when the losses are viewed from that perspective. Affected species include some whose populations are depressed in the areas of Cape Cod Bay and Buzzards Bay, as well as regionally, and some that have commercial and recreational importance (*e.g.*, winter flounder). EPA concluded that available technologies existed to reduce these impacts and, accordingly, that steps should be taken to minimize these adverse environmental impacts under CWA § 316(b). Thus, EPA stated the following in the Fact Sheet:

> [t]he adverse effects of entrainment and impingement by the plant's intake structures could be avoided or reduced by the installation of existing, practicable cooling water intake technologies and the implementation of practicable

> operational measures at Canal Station. Some combination of steps will be needed to meet the CWA § 316(b) requirement that the design, location, construction and capacity of cooling water intake structures reflect the BTA for minimizing adverse environmental effects.

Fact Sheet at 46.

For the Draft Permit, EPA evaluated a number of technological options for reducing entrainment at Canal Station. This evaluation was based, in part, on the assessment of technological options earlier performed by the Permittee, through a report by its contractor Alden Research Laboratory, Inc. (Alden), that was submitted in response to EPA's Request for Supplemental Information issued under CWA § 308(a) on April 30, 2003. Alden's report entitled, "Evaluation of Fish Protection Alternatives for the Canal Generating Station" (hereinafter referred to as "the Alden Report"), was carefully evaluated by EPA and discussed in detail in the Fact Sheet. Early in the analysis, a number of unproven or ineffective technologies were ruled out (e.g., "behavioral barriers"), while other more promising technologies were carried forward for more detailed assessment.

Various types of screening systems were evaluated and although some showed promise for application at Canal Station, problems and/or uncertainties were revealed for each. First, wedgewire screens offered the potential for substantial entrainment and impingement reduction in an environment like the Cape Cod Canal, which has a relatively high velocity current that "sweeps" past the CWISs.[3] Nevertheless, EPA ultimately deemed the technology impracticable for application at Canal Station because the U.S. Army Corps of Engineers (the Corps), which governs construction activities in the Cape Cod Canal, indicated to EPA that the technology would unacceptably interfere with navigation because it would require screens extending into the Canal. The Corps also questioned whether the screens would stand up to winter icing conditions. As a result, EPA concluded that this technology should potentially receive further consideration *if* the navigational and engineering issues could be resolved.

Second, fine-mesh "Ristroph" screens were assessed and were also regarded to have some potential for reducing entrainment and impingement mortality, but Mirant/Alden and EPA both concluded that the degree of adverse impact minimization was uncertain because (a) the extent to which formerly entrained organisms that are stopped by the fine-mesh screens would survive being impinged on and removal from the screens was unclear, and (b) the eggs of some of the species of concern at Canal would be smaller than the openings in the fine-mesh screens and, therefore, would continue to be entrained. EPA agreed with Alden's assessment that this technology "would likely result in some level of improvement but that there are limits to what it can achieve and additional study would be needed to characterize its overall effect." *Fact Sheet*

[3] It should be noted that the Cape Cod Canal represents an unusual (perhaps even unique) type of environment as a man-made conduit between two bays, Buzzards Bay and Cape Cod Bay. In addition, the direction of flow through the Canal reverses with the tide. As such Canal Station's impact on the Canal affects both Bays to some degree, though the power plant's closer proximity to Cape Cod Bay means it likely has a larger effect on that water body. Water flows through the Canal at relatively high velocity (except at slack tide), like a fast-flowing river, but there are also high numbers of eggs and larvae in the water due to the contribution from both Bays, where spawning occurs. In addition, some spawning may occur in the Canal itself.

at 42. Finally, other types of screening systems were ruled out by EPA, consistent with the Alden analysis, because they were either impracticable for application at Canal Station or because they would help reduce impingement mortality but not entrainment.

EPA (and the Alden Report) also considered technological options for reducing impingement mortality and entrainment by reducing water withdrawal volumes by up to 60 percent. First, pumping reduced volumes of water was evaluated, either by shutting down some of the facility's intake pumps, throttling discharge valves, or using variable speed drives. This option was estimated by Alden to be the most expensive of all the options reviewed for Canal Station based on the lost electrical generation that it predicted would be necessitated if a 60 percent flow reduction was mandated at this open-cycle plant.

In addition, reducing intake flow by converting Canal Station to closed-cycle cooling was evaluated. Both EPA and Mirant/Alden deemed this option to be feasible. As EPA stated in the Fact Sheet:

> [a] mechanical draft cooling tower could be retrofitted to the existing circulating system at Canal Station. Many of the components of the condenser system would remain intact and the flow through the condenser would remain approximately the same. Land is available at the site and construction could take place independent of the existing plant operations.
> *Fact Sheet* at 44.[4] EPA's Fact Sheet also noted Mirant/Alden's prediction that "mist eliminators and plume abatement equipment would be required to minimize impacts on nearby transportation . . .," but EPA explained that "whether or not plume abatement equipment would be needed would require careful analysis of many factors, but that if they were required, it would add cost to the cooling

[4] EPA notes that both Mirant/Alden and EPA focused their respective closed-cycle cooling analyses on the use of wet, mechanical draft cooling towers, but that wet, natural draft cooling towers also provide a viable option. EPA focused on mechanical draft cooling towers because (1) Alden focused on this technology, and (2) it is currently the most commonly installed cooling tower technology in the United States. While both technologies could serve as the basis of a closed-cycle retrofit, some of the issues to consider are common to each technology, and some of the issues are different for the two technologies. Natural draft towers are substantially taller than mechanical draft towers and, therefore, tend to have greater visual impact. Mechanical draft towers are lower to the ground and require more cooling tower cells and, as a result, cover a larger ground area, which may also pose visual effects. In both cases visual effects may also result because under certain meteorological conditions the water vapor emitted from the cooling towers condenses to visible steam or fog. Natural draft towers do not rely on mechanical fans and, therefore, tend to be quieter than mechanical draft towers and have lower auxiliary energy costs. Such energy savings may be offset by a somewhat greater efficiency penalty associated with natural draft cooling towers. Natural draft towers may or may not result in greater capital and construction costs than mechanical draft towers, depending on prevailing materials and equipment costs in the industry. Natural draft towers emit water vapor from a higher point and, therefore, tend to achieve good dispersion and pose less concern about "vapor plume" problems from ground icing or fogging. Of course, the water vapor that natural draft towers do emit may travel farther than that emitted by mechanical draft towers. Natural draft cooling towers have been used at coastal power plants in the past and were recently identified as the technology of choice by Brayton Point Station for its planned cooling tower retrofit. *See The Herald* News article entitled, "Dominion's big plans" (Jan. 22, 2008); *Providence Journal* article entitled, "Brayton Point cooling towers are on the horizon" (Jan. 23, 2008). Therefore, EPA specifically concludes that both natural draft and mechanical draft wet cooling towers are options open to Mirant for satisfying the Final Permit's CWIS conditions.

> tower system." *Id.*[5] Still, this option was estimated to be both less expensive (approximately $108 million versus $160 million) and capable of larger flow (and entrainment/impingement) reductions than the reduced pumping options (reductions of from 70 to 98 percent, depending on certain factors, for closed-cycle cooling versus 60 percent or less for reduced pumping). Therefore, the reduced pumping options were eliminated from further review in favor of the closed-cycle cooling option.

Although cheaper than cost estimates for the reduced pumping options, the costs estimated for closed-cycle cooling were substantial, at approximately ten times the cost estimated for the screening options. Nevertheless, the analysis indicated that closed-cycle cooling would achieve significantly larger reductions in adverse impacts (entrainment would be reduced by 70-98%, without increased impingement mortality), as compared to an uncertain degree of entrainment reduction, coupled with an uncertain degree of related increases in impingement mortality, for the screening options. As a result of this analysis, EPA concluded that:

> . . . permit limits based on the installation of Alternative 6 [(*i.e.*, closed-cycle cooling)], which would yield the largest entrainment and impingement mortality reduction of the six alternatives, would satisfy CWA § 316(b)'s BTA requirements, see 40 C.F.R. § 125.94(a)(1)(i), and that Alternative 6 remains open to Canal Station as a potential means of compliance.

Fact Sheet at 44.

Despite the fact that closed-cycle cooling would reduce entrainment to the largest degree (*i.e.*, would *minimize* it), EPA also decided that it should not determine that closed-cycle cooling is the BTA at Canal Station for the Draft Permit. EPA reached this conclusion because it was trying to apply CWA § 316(b) on a BPJ basis under 40 C.F.R. §125.95(a)(2)(ii) of the Phase II Rule while also taking reasonable account of the substantive requirements of that Rule. In other words, EPA's BPJ was being informed by the provisions of this then effective, applicable Rule, and this created a number of uncertainties under the unusual circumstances of this case.

EPA stated the following in the Fact Sheet:

> . . . EPA has assessed the entrainment impacts of Canal Station and has determined that control measures to reduce entrainment are necessary to provide the BTA for minimizing adverse environmental impacts, as required by CWA § 316(b). While Canal could comply with CWA § 316(b)'s BTA requirement by deciding to retrofit its cooling system with closed-cycle cooling (Alternative 6, discussed above), EPA is not presently prepared to mandate closed-cycle technology in this permit because of the need to further evaluate its cost as well as the performance capabilities of other significantly less expensive alternatives. Regarding the other technologies that can reduce entrainment, further evaluation is needed of their entrainment reduction capabilities, any offsetting impingement mortality increases they might cause, their costs, and any problems with

[5] As noted above, natural draft towers would likely reduce any water vapor plume issues.

> engineering/logistical practicability that they might pose (e.g., possible interference with navigation in the Cape Cod Canal).
>
> EPA notes that the new Phase II Regulations require the development of the information necessary to compare compliance alternatives and identify BTA requirements, and that deadlines for submitting this information are phasing in over the next few years. Thus, for example, facilities must submit a Proposal for Information Collection (PIC) by October 2006 and a Comprehensive Demonstration Study (CDS) by January 2008. See 40 C.F.R. § 125.95(a)(2)(ii) and (b). Therefore, EPA's site-specific BPJ determination of BTA limits under CWA § 316(b) with respect to entrainment reduction for Canal's permit is to require Canal to follow the procedures for developing, selecting, and implementing one of the five compliance alternatives, mandated by the Phase II Regulations. These requirements are spelled out in Section 8 of the Draft Permit and will include submission to EPA and DEP as soon as practicable, but no later than October 7, 2006, of the permittee's preliminary selection of one of the five compliance alternatives discussed in 40 C.F.R. § 125.94 for providing the Best Technology Available for minimizing adverse environmental impact and submission to EPA and DEP of the permittee's final compliance alternative selection no later than January 7, 2008.

Fact Sheet at 45-46.

EPA found questions about the cost of closed-cycle cooling and the performance of the screening options of critical importance because under the Phase II Rule, the five compliance options open to permittees included the chance to obtain less stringent site-specific standards if it could demonstrate that the costs for Canal Station to meet the Rule's otherwise applicable standards would be significantly greater than either the benefits of meeting those standards or the costs that EPA had contemplated would be experienced by like facilities meeting the standards. *See* 40 C.F.R. § 125.94. Moreover, EPA considered that the Rule also allowed permittees to propose meeting the ultimately applicable performance standards with restoration measures. *Id. See also Fact Sheet* at 46, 25. Implicit in EPA's decision was the concern that it might be inequitable to determine that closed-cycle cooling was the BTA at Canal Station, and to impose entrainment reduction limits based on that technology, when the Phase II Rule would allow the Permittee to seek less stringent site-specific performance standards. Furthermore, it was possible under the Rule that Canal Station would be able to meet any such less stringent, site-specific standards using either one of the screening systems or a restoration program or a combination of the two.[6] Finally, since the Phase II Rule laid out a schedule for the submission of various types of information for resolving the compliance standards and methods, EPA decided that embodying the Rule's schedule in the Draft Permit was an appropriate way to address the concerns and uncertainties raised by the unusual facts of this case because it would satisfy the Rule without creating the possible inequities that would be associated with foreclosing alternatives specifically authorized by the then effective Phase II Rule.

[6] EPA notes that, contrary to Mirant's comment, the Phase II Rule did not legally preclude the selection of closed-cycle cooling as the BTA at a specific facility either on a BPJ basis or as a result of the Phase II process. In light of the suspension of the Phase II Rule, EPA does not believe it is necessary to respond further to this specific comment.

Therefore, EPA chose, on a BPJ basis, to require that the Permittee submit all the information required by the Phase II Rule on the schedule mandated by the Rule and implement the permit limits ultimately determined under the Phase II process. *See Fact Sheet* at 46. While these permit limits failed to set specific BTA-based entrainment reduction conditions, which might otherwise appear contrary to CWA § 402(a) and 40 C.F.R. § 125.95(a)(2)(ii), as discussed above, EPA felt these limits were appropriate because they followed precisely the applicable procedural requirements of the Phase II Rule and because of the uncertainties and equities raised by the unusual facts of this case. *Id. See also Mirant Kendall Station NPDES Permit # MA0004898, Responses to Comments (September 2006),* at Resp. H1, pp. H12 – H13; Resp. H8, pp. H28 – H29 (discussing application of CWA § 316(b) on a BPJ basis under 40 C.F.R. § 125.95(a)(2)(ii) of the Phase II Rule, and citing *NRDC v. EPA,* 863 F.2d 1420, 1428 (9th Cir. 1988).

4. Developments Since Issuance of the Draft Permit

a. Public Comments

In determining what conditions should go into the Final Permit, EPA carefully considered public comments received on the Draft Permit's CWIS-related conditions. These comments are detailed above and are discussed and responded to below. Public comments are discussed and responded to here that pertain particularly to the changed permit conditions for CWISs.

Mirant's comments essentially accepted the Draft Permit's conditions mirroring the Phase II Rule's information submission requirements, but objected to any additional requirements. As quoted above, Mirant argued that any such additional requirements:

> . . . far exceed EPA's regulatory authority under the Phase II Rules, circumventing the step-wise process EPA put in place to ensure that permittees have an opportunity to select compliance alternatives and design "technology installation and operation plans" ("TIOPs") that will comply with the applicable performance standards. . . . Mirant Canal believes that imposition of § 316(b)-related requirements beyond those in Part I.A.8 are neither legally justified nor warranted as a practical or environmental matter. Imposing such requirements, when they are or may prove to be inconsistent with the results of the PIC/CDS process would be arbitrary and capricious, especially given the fairly short period of time involved until those reports are complete.

Mirant Comments at IX.A.1. Thus, Mirant argued that despite the terms of 40 C.F.R. § 125.95(a)(2)(ii), any BPJ-based condition going beyond the then operative requirements of the Phase II Rule – *i.e.*, the information gathering and submission requirements – was, in fact, circumventing the Rule and should be regarded as unlawful or arbitrary and capricious.

EPA disagrees with this comment by Mirant based on the Phase II Rule. The Phase II Rule expressly authorized the imposition of BPJ limits for facilities in the same circumstances as Mirant. This would have been meaningless if EPA had intended that in all cases permitting authorities should be entirely restricted to applying the full process of the Phase II Rule before imposing any substantive CWIS requirements. Nevertheless, as discussed above, EPA did agree

that in light of the uncertainties and equitable concerns raised by the particular circumstances of this case, it should not exercise its BPJ to determine that closed-cycle cooling was the BTA for the Draft Permit. EPA reached this conclusion – despite the fact that this technology would achieve the largest reductions in adverse environmental impacts and would satisfy BTA requirements – because the performance capabilities of the screening technologies were unclear and these technologies were substantially less expensive than closed-cycle cooling and might possibly qualify as the BTA under, for example, the cost/benefit-based or cost/cost-based site-specific standards provisions of the Phase II Rule.

With regard to closed-cycle cooling, Mirant's comments disagreed with EPA's stated view that the technology "remains open" as a potential means of compliance. Fact Sheet, p. 44. Mirant newly projected costs for this option of $122.2 million and argued that these costs were "self-evidently 'significantly greater'" than the benefits of the option and could not be justified under the Phase II Rule. (The reference to a "significantly greater than" cost-to-benefit standard apparently referred to the cost/benefit test stated in the Phase II Rule for purposes of site-specific performance standards. *See* 40 C.F.R. § 125.94(a)(5)(ii).) EPA also disagrees with this comment by Mirant. The cost of this option is *not* "self-evidently" significantly greater than the benefits it would provide. Mirant has estimated the *cost* of closed-cycle cooling but has not provided an evaluation of the benefits of the entrainment and impingement mortality reductions that would result from using closed-cycle cooling. Such a benefits analysis would be needed to support a comparison of the costs and benefits of closed-cycle cooling. The Company's assertion that the costs of closed-cycle cooling exceed its benefits appears, at most, to reflect an implicit judgment about the option's benefits.[7]

Mirant also stated that closed-cycle cooling would raise a number of environmental concerns, including creation of a fog bank in the area of the plant (and associated "road hazards to navigation"), noise impacts, aesthetic concerns, and creation of salt drift and solid waste. Mirant only identified these concerns in a general, conclusory manner, however, without characterizing the extent of the alleged problems or documenting them. EPA does not regard assertions of this type pertaining to non-water impacts to be sufficient to rule out the closed-cycle cooling option.

EPA also received comments on the Draft Permit from a number of federal and state administrative agencies. These comments are presented above. NOAA stated that it was "concerned with impingement and entrainment of fishery resources due to the operation of this facility." NOAA also stated it would not regard the EFH assessment to be complete until it had

[7] Mirant's comments include neither detailed qualitative nor quantitative assessments of the benefits. In addition, EPA notes that Mirant's above-quoted comments also urge that providing partial closed-cycle cooling for Canal Station would only reduce the degree of entrainment and impingement reduction benefits without "necessarily reducing the cost" of the cooling system conversion. This comment suggests that any partial closed-cycle option would be unreasonable. Contrary to Mirant's comment, however, EPA expects that the cost of a partial closed-cycle option would, in fact, be lower. For example, EPA concludes that equipment costs would likely be lower if, for example, cooling tower capacity was provided only for one of Canal Station's two generating units, rather than for both. Furthermore, EPA expects that such a partial closed-cycle option could be constructed so that any generating unit outages could be limited to one of the units, which would reduce any outage-related costs. Mirant's reasons for commenting that costs for a partial closed-cycle option would not necessarily reduce costs are unclear.

been given a chance to evaluate the information submitted with the CDS. NOAA asked that "the EFH consultation for the reissuance of the Mirant Canal NPDES permit [to] be held in abeyance until the CDS is developed and submitted to EPA." These comments from NOAA indicate that it did not initially regard the Draft Permit's intake conditions to be sufficient due to their failure to specify particular performance standards and technologies to meet them. In a subsequent letter, however, NOAA both indicated its support for steps to reduce entrainment by Canal Station and withdrew its request to hold the EFH consultation in abeyance. NOAA made this change in light of the fact that the Draft Permit's conditions tracked the Phase II regulations and would require completion of the process for developing standards under the Rule and identifying the BTA for the next permit renewal.

Various Massachusetts natural resource protection agencies also submitted comments. MA-DMF called for the Permit to require Canal Station to "retrofit the plant with a closed-cycle cooling system." MCZM "offer[ed] its strong support for EPA's requirement of upgrades to the Canal Station Cooling Water Intake Structure (CWIS) design." MA-Riverways stated that "it should be a priority to eliminate any preventable mortality for this facility," and also that acceptable loss levels should be identified to inform the further evaluation of technological alternatives required by the permit. Thus, while MA-DMF called for closed-cycle cooling to be determined to be the BTA for Canal Station, MA-CZM and MA-Riverways indicated support for improvements to reduce mortality from entrainment and impingement but, in effect, accepted that entrainment reduction improvements would not take place until later under the Phase II Rule process.

b. Court Decisions and Suspension of the Phase II Rule

In response to the January 25, 2007, decision by the United States Court of Appeals for the Second Circuit in the case of *Riverkeeper, Inc., et al. v. United States EPA*, 475 F.3d 83 (2d Cir. 2007) ("*Riverkeeper II*"), EPA on July 9, 2007, published a notice in the Federal Register formally suspending the Phase II Rule. *See* 72 Fed. Reg. 37,107 (July 9, 2007). This notice suspends all of 40 C.F.R. Part 125 Subpart J, except for § 125.90(b), which provides that "[e]xisting facilities that are not subject to requirements under this [subpart J] or another subpart of this part [125] must meet requirements under section 316(b) of the CWA determined by the Director on a case-by-case, best professional judgment (BPJ) basis." The suspension notice further provides:

> Notably, EPA by this action is not suspending 40 CFR 125.90(b). This retains the requirement that permitting authorities develop BPJ controls for existing facility cooling water intake structures that reflect the best technology available for minimizing adverse environmental impact. This provision directs permitting authorities to establish section 316(b) requirements on a BPJ basis for existing facilities not subject to categorical section 316(b) regulations. Establishing requirements in this manner is consistent with the CWA, case law, and the [EPA's] March 20, 2007 memorandum's direction to do so. Phase II facilities are not subject to categorical requirements under Subpart J while this suspension is in effect, and therefore this provision applies in lieu of those requirements.

The "suspension provides a clear statement by the Agency that the existing Phase II requirements (with the exception of one provision unaffected by the *Riverkeeper II* decision [pertaining to the

exercise of BPJ]) are suspended and are not legally applicable." 72 Fed. Reg. at 37,108. Pursuant to 5 U.S.C. 553(b) and (d), the suspension took effect immediately upon publication. The suspension also noted that "[i]n the event that the [*Riverkeeper II*] decision is overturned. . . the Agency will take appropriate action in response." 72 Fed. Reg. 37,108 at n.1.

The *Riverkeeper II* court remanded significant portions of the Phase II Rule to the Agency, holding that various provisions of the Rule were either inconsistent with the CWA, inadequately explained or inconsistent with requirements of the Administrative Procedure Act. *See, e.g., id.* at 130-31. The court indicated, in essence, that EPA should set a performance benchmark for the BTA under CWA § 316(b) corresponding to the degree of adverse impact reduction achievable by the technology used by the best performing Phase II facilities in the industry. *See id.* at 99-100, 107-09. The court further indicated that EPA could not decline to determine that this technology is the BTA on a cost/benefit comparison basis, *see id.* at 99-105, 114-15, but it could reject the technology if it is not technologically or economically available (i.e., the costs could not be "reasonably borne" by the industry, taking into account "the technology-forcing character of the CWA"), or if it had unacceptable non-water environmental effects or unacceptable energy effects. *See id.* at 99-100. In addition, the court indicated that EPA could apply a cost-effectiveness test in which the best performing technology sets the performance benchmark, but could then be rejected as BTA in favor of another technology that achieves "essentially the same benefits but ... [has] markedly different [(*i.e.,* lower)] costs." *Id.* at 101. The court remanded the Phase II Rule to EPA to justify its rejection of closed-cycle cooling as the national, categorical BTA in favor of a "suite" of other technologies (such as various screening systems) on a basis other than a cost/benefit comparison, or to select a new BTA consistent with the principles set forth by the court. *See id.* at 103-05, 130.

The court also remanded the Phase II Rule's provision allowing site-specific performance standards on a cost/benefit basis, *see id.* at 113-15, as well as its provision allowing compliance through environmental restoration measures, *see id.* at 108-10, as being beyond the Agency's authority under the CWA. The Rule's provision allowing site-specific standards on a cost/cost basis was also remanded by the court due to EPA's failure, in the court's estimation, to provide adequate notice-and-comment on the provision and because it might need to be altered due to the new BTA assessment required by other aspects of the court's decision. *See id.* at 111-13.

Industry parties in the *Riverkeeper II* case then petitioned the United States Supreme Court for certiorari of various aspects of the Second Circuit's decision. While clearly stating its disagreement with certain aspects of the Second Circuit's decision, the United States filed an opposition to the petition for certiorari. *See Brief for the Federal Respondents in Opposition* (February 2008) in *Entergy Corporation v. Environmental Protection Agency* (Supreme Court Nos. 07-588, 07-589 and 07-597). For example, the United States stated its disagreement with the Second Circuit's ruling on the cost/benefit issue, contending that the Clean Water Act *does* authorize EPA to consider the relationship between an option's costs and benefits in determining BTA standards under CWA § 316(b). *Id.* at 10-13. Nevertheless, the United States opposed the petition for certiorari on the cost/benefit issue on the grounds (1) that there was no split in the circuit courts on the issue, *id.* at 13, and (2) that "[w]hile the court of appeals' decision is undoubtedly important, and it unjustifiably constrains EPA's consideration of costs and benefits,

it is unclear how significant the decision will ultimately prove to be" because, among other things, EPA has yet to complete the Phase II Rule remand proceeding. *Id.* at 14-16.

On April 14, 2008, the Supreme Court granted certiorari over a single issue from the *Riverkeeper II* decision: "Whether Section 316(b) of the Clean Water Act . . . authorizes the [EPA] to compare costs with benefits in determining the 'best technology available for minimizing adverse environmental impact' at cooling water intake structures." It is presently unclear when a decision on this issue will be issued by the Supreme Court or what the ultimate effect of the decision will be on a new CWA § 316(b) Phase II Rule. It is also presently uncertain when EPA will issue new proposed and final Phase II Rules.

5. Changed CWIS Limits for the Final Permit

EPA has significantly revised the CWA § 316(b)-based conditions for the Final Permit based on a BPJ determination that entrainment reductions comparable to what could be achieved by converting Canal Station's open-cycle cooling system to a closed-cycle cooling system represents the BTA for minimizing adverse environmental impacts under the specific facts of this case. This revised BTA determination since the Draft Permit, along with the specification of corresponding new limits for the Final Permit, results from EPA's re-evaluation of the facts of this case and prior analyses supporting the Draft Permit, in light of new legal developments and public comments.

As discussed above, since issuance of the Draft Permit, EPA suspended the Phase II Rule and decided that permit limits under § 316(b) should be developed on a BPJ basis pending the promulgation of any new standards (or any legal developments that might revive all or part of the Phase II Rule). The Draft Permit's entrainment-related provisions essentially required the collection and submission of the information required by the Phase II Rule to support a future specification of the BTA (and associated permit limits) for the facility, which according to the Draft Permit would then have to be implemented. In other words, the Draft Permit mandated that the BTA be specified during the term of the permit and the attendant permit limits be implemented, but the Draft Permit's BPJ-based requirements under 40 C.F.R. § 125.95(a)(2)(ii) also left a range of different compliance alternatives potentially open to the Permittee due to uncertainties and equitable concerns arising from the Phase II Rule's range of compliance options. The suspension of the Phase II Rule's and its national, categorical BTA determination as well as specific provisions regarding information submissions and compliance alternatives has clarified the uncertainties and resolved the equitable concerns raised by the Phase II Rule that prompted EPA to forego selection of a single, definitive BTA at the Draft Permit stage.[8] Furthermore, because the Rule's information gathering requirements and schedule are no longer in effect, they no longer provide a basis for the Draft Permit's conditions in that regard.

In light of these considerations, EPA has re-assessed the options analyzed in the Fact Sheet and record for the Draft Permit in order to determine what the BTA should be for the Final Permit. EPA concludes that undertaking this effort is consistent with CWA §§ 316(b) and 402(a), 40

[8] It should be emphasized that EPA *could have* established the final BTA in the Draft Permit. Indeed, EPA had already identified a technology (*i.e.*, closed-cycle cooling) that *would* satisfy the BTA standard and, without more, *would have been* the BTA but for EPA's discretionary decision to account for the uncertainties and equitable considerations stemming from the terms of the then effective Phase II Rule.

C.F.R. §§ 125.90(b), 122.43(a), 122.44(b)(3), and EPA's above-cited Federal Register notice suspending the Phase II Rule, and that it is also consistent with the overarching goals of the CWA, as expressed by Congress in CWA § 101, 33 U.S.C. § 1251. As a result of this analysis, which is based on the best reasonably available information, EPA has decided that the closed-cycle cooling alternative currently represents the BTA for Canal Station.

EPA's BTA assessment is presented in detail below, but a few points will be noted here. First, as the Fact Sheet stated, closed-cycle cooling has been deemed by both EPA and Mirant/Alden to be technologically feasible at Canal Station. Second, both EPA and Mirant/Alden have found that closed-cycle cooling results in the largest reductions in entrainment and impingement mortality of all the options evaluated in detail. *See n. 17, infra.*

Third, the suspension of the Phase II Rule eliminates the regulations on which the Draft Permit's entrainment-related CWIS conditions were based. For the Draft Permit, EPA did not mandate that closed-cycle cooling was the BTA for Canal Station despite the fact that it would achieve the largest reductions in entrainment of the options considered. This was because although the full extent to which the screening system alternatives could reduce entrainment and impingement mortality was unclear, these options were substantially less expensive than closed-cycle cooling and it was possible under the Phase II Rule that they could qualify as the BTA for Canal Station. Under the Phase II Rule, the facility could possibly have qualified for site-specific performance standards if it could demonstrate that the cost of meeting the Rule's standards with closed-cycle cooling would be significantly greater than the benefits of meeting those standards and/or the costs considered by EPA for a facility like Canal Station in setting those standards. As a result, under the Phase II Rule, fine-mesh screens, for example, could have proven to be the BTA after further analysis, even if they would have yielded significantly lower entrainment reductions than closed-cycle cooling, because less stringent site-specific performance standards that could be met with fine-mesh screens might have been supportable on a cost/benefit or cost/cost basis. In addition, the Phase II Rule allowed a facility to propose restoration programs for meeting the Rule's performance standards. EPA decided that these possibilities, which flowed from the Phase II rule, made it reasonable and equitable to try to resolve the uncertainties about the technologies (or restoration measures) through further study before finally specifying a BTA. As a result, the Draft Permit included requirements for such study based directly on the information collection and submission requirements of the Phase II Rule.

At present, however, these considerations no longer militate against determining that closed-cycle cooling is the BTA at Canal Station. The Phase II Rule and its provisions regarding site-specific performance standards, restoration programs, and information gathering and submission are no longer in effect. Moreover, the *Riverkeeper II* decision presently precludes a BPJ-based BTA decision based on either a comparison of the cost of a technology with its benefits or the use of restoration programs as BTA measures. Thus, the *Riverkeeper II* decision and the suspension of the Rule has clarified the prior uncertainties and resolved the potential inequities raised by the facts of this case under the Rule. While the Supreme Court will be reviewing the cost/benefit issue in the future, as explained above, EPA is presently abiding by the Second Circuit's decision. As a result, it makes sense to replace the Draft Permit's entrainment-related requirements – which focused only on requiring compliance with the Phase II Rule's information

submission requirements and implementing the resulting BTA determination – with the Final Permit's intake limits based on closed-cycle cooling as the BTA at Canal Station.[9]

At the same time, however, EPA has drafted the Final Permit to allow Canal Station the opportunity to further evaluate additional technologies beyond closed-cycle cooling in light of the uncertainties regarding the performance and/or availability of such additional technologies that have been noted above and were discussed in the Fact Sheet. This reflects the fact that although EPA's analysis has not uncovered any new information since issuance of the Draft Permit to suggest that these other technologies can perform as well as closed-cycle cooling—to the contrary, the information appears to confirm that the capability of these other technologies is uncertain at best in a setting like Canal Station's (see David E. Bailey, Electric Power Research Institute, and Greg Allen, Alden Research Laboratory, *Assessment of Alternative Fish Protection Technologies and Operational Measures for Potential Use at Mirant Kendall LLC (Undated)*; *California's Coastal Power Plants: Alternative Cooling System Analysis, Tetra Tech, February 2008.*)—EPA does not want to foreclose the possibility that another technology could be found to satisfy the BTA standard at Canal Station. Thus, the Final Permit imposes an entrainment reduction *performance standard* based on closed-cycle cooling, but allows Mirant to pursue another technology (or combination of technologies and operational measures) if it demonstrates that such an alternative approach will meet the performance standard. In addition, the Final Permit specifically notes that if Mirant feels that it can establish that closed-cycle cooling is not the proper BTA, it may apply for a permit modification to establish an alternative BTA (and corresponding permit limits). Of course, the Final Permit's limits would remain in effect unless and until EPA decided to modify the permit.

As previously explained, when the Final Permit's limits go into effect, EPA understands that Mirant is unlikely to have the facilities needed to meet the limits immediately as the Permit will require. Therefore, EPA expects to issue an administrative compliance order under CWA § 309(a) to Mirant that will impose a schedule for selecting an approach for complying with the Permit, possibly seeking a permit modification, and ultimately installing technology to comply with the Permit's limits. Again, the Final Permit sets a performance standard based on closed-cycle cooling as the BTA but does not necessarily mandate that this technology be used if an alternative technology is identified that can achieve comparable performance.

The changes that EPA has made for the Final Permit also respond to comments made on the Draft Permit. All the federal and state natural resource protection agencies that commented on the Draft Permit expressed serious concern about entrainment and impingement by Canal Station and supported permit limits to require the reduction of these adverse impacts. EPA's Final Permit is responsive to this overall concern. MA-DMF specifically called for permit limits based on closed-cycle cooling. EPA's Final Permit is responsive to this comment from the state fisheries agency. NOAA indicated first that it could not complete the EFH consultation under the MSA unless the Permit set actual BTA limits, then later decided that it would accept the Draft Permit's information submission-oriented requirements in light of the provisions of the

[9] If a decision by the Supreme Court results in comparative cost/benefit assessment being restored as a proper consideration for EPA in developing BTA-based limits under CWA § 316(b), EPA can consider revisiting and potentially modifying the permit's CWIS limits under 40 C.F.R. § 122.62.

Phase II Rule. With the suspension of the Phase II Rule, the thrust of NOAA's comments are to call for EPA to set specific BTA standards for reducing entrainment and impingement mortality. EPA's Final Permit is responsive to this and the specific requirements included in the Permit will satisfy the requirements of the MSA. Finally, the Final Permit is also responsive to the comments of MA-Riverways, which called for the elimination of "preventable mortality" from CWIS impingement and entrainment and the development of clear standards for the reduction of these impacts.

The change in permit conditions obviously runs counter to Mirant's comments on the Draft Permit, which opposed closed-cycle cooling being determined to be the BTA for Canal Station. Most of Mirant's comments were posed in terms of Mirant's argument that any selection of closed-cycle cooling as the BTA on a BPJ basis would be unlawful and inappropriate because of the strictures of the Phase II Rule. EPA has already explained above that it disagrees with Mirant's comment that selection of closed-cycle cooling as the BTA was necessarily barred by the terms of the Phase II Rule, which, in fact, authorized EPA to select the BTA on a BPJ basis for Canal Station under 40 C.F.R. § 125.95(a)(2)(ii), and which indicated that closed-cycle cooling *per se* complied with the Rule's requirements. *See* 40 C.F.R. § 125.94(a)(1)(i). Still, EPA also explained at the time of the Draft Permit that it concluded that its BPJ should be informed by the terms of the Phase II Rule, and that in light of the Rule, uncertainties and equity considerations weighed against mandating closed-cycle cooling as the BTA at the time of the Draft Permit. While this was not a required result, it was within the range of EPA's reasonable discretion in applying its BPJ to the unusual circumstances at hand. As explained above, however, the Phase II Rule has now been suspended by the Agency after remand by the Second Circuit. Therefore, these Phase II Rule-related uncertainties and equitable concerns have been cleared up.

Mirant also commented that closed-cycle cooling should be rejected because its costs would self-evidently be significantly greater than its benefits. As discussed above, EPA does not regard this conclusion to be "self-evident" and Mirant provides no real analysis to support its assertion. In addition, with the suspension of the Phase II Rule, the Rule's provision for site-specific standards to ensure that BTA costs would not be significantly greater than the resulting benefits is no longer in effect. Furthermore, in *Riverkeeper II,* the Second Circuit held that cost/benefit comparisons are not an appropriate basis for determining the BTA under CWA § 316(b). Thus, under *Riverkeeper II,* EPA is not required to, and indeed is barred from, undertaking the type of cost/benefit-based decision-making urged by Mirant. While the Supreme Court is going to review the cost/benefit question, it is presently uncertain when the Court will reach a decision or what that decision will hold. Finally, Mirant also commented that closed-cycle cooling would result in a number of adverse non-water environmental consequences, but it presented these issues in only a conclusory fashion, providing little or no data or specific analysis on these points. These unsupported assertions are insufficient to establish that closed-cycle cooling is not the BTA. EPA has reasonably evaluated these issues in the record for the Draft Permit and in response to comments and has reached a contrary conclusion regarding them to that stated by Mirant.

Finally, Mirant commented in support of the Draft Permit's information submission requirements on the ground that they comported with the Phase II Rules requirements for

information submission. EPA has now eliminated those provisions from the Final Permit because the information requirements of the Phase II Rule are no longer in effect as result of the Rule's suspension.

6. EPA's Revised BPJ Determination of BTA for the Final Permit

a. Introduction

In the absence of any controlling national categorical technology standards, EPA applies the requirements of CWA § 316(b) on a site-specific, BPJ basis. Neither the CWA nor EPA regulations dictate a specific methodology for developing BPJ-based limits under § 316(b). What is clear is that the elements specified in the statute – namely, that CWIS limits should reflect the best technology available for minimizing adverse environmental impacts – must be satisfied.[10] For additional guidance in developing BTA limits for CWISs on a BPJ basis, EPA has also looked by analogy to EPA practice in the BPJ development of BAT effluent limits.[11] As discussed above, as the starting point for determining the "best" technology for minimizing adverse environmental impacts, EPA looks for the technology that would achieve the maximum reduction in those impacts, including entrainment and impingement, from among the viable options. This is consistent with the common meaning of the terms "best" and "minimize," which are respectively defined by the *American Heritage Dictionary (2nd Ed.)* (1982), as "surpassing all others in excellence, achievement, or quality . . .," and "reduc[ing] to the smallest possible amount, extent, size, or degree." *See also Decision of the General Counsel No. 63 (In re Central Hudson Gas and Electric Corporation, et al.)*, p. 371, 381 (July 29, 1977); *In the Matter of Public Service Company of New Hampshire, et al. (Seabrook Station, Units 1 and 2)*, 10 Env't Rep. Cas. (BNA) 1257, 1260 (EPA June 17, 1977); *Decision of the General Counsel No. 41 (In re Brunswick Steam Electric Plant)*, 197, 203 (June 1, 1976). Based on the language and structure of CWA § 316(b), EPA has also determined that CWISs must reflect the BTA for

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[10] Thus, a BPJ analysis results in a valid, facility-specific BTA determination. In *NRDC v. EPA*, 859 F.2d 156, 199 (D.C. Cir. 1988) (industry and environmental group challenge to 1979 revisions to NPDES regulations, including the ban on backsliding from BPJ limits), the court explained:

> [i]n what EPA characterizes as a 'mini-guideline' process, the permit writer, after full consideration of the factors set forth in section 304(b), 33 U.S.C. § 1314(b) (which are the same factors used in establishing effluent guidelines), establishes the permit conditions 'necessary to carry out the provisions of [the CWA].' § 1342(a)(1). These conditions include the appropriate ... BAT effluent limitations for the particular point source. ... [T]he resultant BPJ limitations are as correct and as statutorily supported as permit limits based upon an effluent limitations guideline.

Id. See also Texas Oil & Gas Ass'n v. EPA, 161 F.3d 923, 929 (5th Cir. 1998) ("Individual judgments thus take the place of uniform national guidelines, but the technology-based standard remains the same.").

[11] Although the *BAT* effluent discharge standard is not identical to the *BTA* standard for cooling water intake structures, Congress used the same words for both standards, albeit combined in different ways, and it is, therefore, reasonable and appropriate to analogize to the BAT standard in seeking guidance for how to apply the terms "best" and "available" in the BTA standard. Furthermore, § 316(b) indicates that CWIS requirements are to be included in standards developed under CWA §§ 301 and 306, which suggests that it is reasonable to look to the BAT effluent limitation standard for guidance concerning factors to consider in setting a BTA-based limit for CWISs under § 316(b). *See Riverkeeper II*, 475 F.3d at 97-98; *Riverkeeper I* 358 F.3d at 186, 195.

minimizing adverse environmental impacts, whether or not those adverse impacts are considered to be significant. *See Decision of the General Counsel No. 41*, at 203 ("The [cooling water intake] structures must reflect the best technology available for *minimizing* . . . adverse environmental impact – significant or otherwise.") (emphasis in original); *Decision of the General Counsel No. 63*, at 381-82 ("Under Section 316(b), EPA may impose the best technology available . . . in order to minimize . . . adverse environmental impacts – significant or otherwise.").

At the same time, EPA has never defined "minimization" necessarily to mean the complete elimination of all impacts. In other words, EPA has read CWA § 316(b) to intend that entrainment and/or impingement should be regarded as an "adverse impact" that must be minimized through the application of the BTA, but that this might or might not lead to the elimination of all such impacts in a given case.

b. The Best Performing Existing, Open-Cycle Power Plants Are Those That Have Converted To Closed-Cycle Cooling

When applying the *BAT standard for effluent limits*, the CWA calls for EPA to look to the single "best" performing plant in the industry – in terms of effluent reduction– as the starting point.[12] *See* 40 C.F.R. § 125.3(c)(2)(i). EPA has also determined that in identifying the best performing technology (or technologies), it may look to any viable "transfer technologies" -- that is, technologies from another industry that can be "transferred" to the industry in question -- as well as technologies shown to be viable in research though not yet implemented at a full-scale facility.[13]

The above practices for developing BAT effluent limitations are also appropriate to apply to this BPJ development of BTA standards under § 316(b). Therefore, EPA has identified the best-performing CWISs in the same industrial category as Canal Station. Given that Canal Station is an existing power plant, EPA looked to existing power plants that have achieved the greatest reductions in adverse environmental impacts from their CWISs. In addition, EPA considered technologies that might potentially be feasible for use at Canal Station even if not previously used to retrofit an existing facility.[14]

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[12] *E.g., Texas Oil & Gas Ass'n v. United States E.P.A.*, 161 F.3d 923, 928 (5th Cir. 1998); *Association of Pacific Fisheries v. Environmental Protection Agency*, 615 F.2d 794, 816-17 (9th Cir. 1980); *American Meat Institute v. E.P.A.*, 526 F.2d 442, 462-63 (7th Cir. 1975).

[13] These approaches to determining BAT are supported by the CWA's legislative history and have been upheld by the courts. *E.g., American Petroleum Institute v. E.P.A.*, 858 F.2d 261, 264-65 (5th Cir. 1988); *Pacific Fisheries*, 615 F.2d at 816-17*; BASF Wyandotte Corp. v. Costle*, 614 F.2d 21, 22 (1st Cir. 1980); *American Iron and Steel Institute v. E.P.A.*, 526 F.2d 1027, 1061 (3d Cir. 1975); *American Meat Institute*, 526 F.2d at 462-63.

[14] In this regard, EPA could consider, for example, whether a technology used at a *new* power plant could constitute a viable "transfer technology" for use at an *existing* plant.

Identifying the best performing technology for the industrial category provides a starting point for determining the BTA, *but it is not determinative by itself.* The BPJ application of the BTA standard to a particular facility is conducted on a case-by-case, site-specific basis, and a technology that works at one power plant might not actually be feasible at another plant due to site-specific issues (*e.g.*, space limitations). Accordingly, a technology that would be infeasible at Canal Station would not be the BTA for this permit, even if that technology worked at a different facility. In addition, it is also necessary to consider various other pertinent factors beyond the minimization of adverse intake impacts and technical feasibility. These factors include considerations such as economic feasibility, "non-water" environmental effects, and energy effects, and these factors must be evaluated specifically with regard to Canal Station.

Consistent with its analysis in the Fact Sheet, EPA has determined that the best performing facilities in terms of minimizing the adverse environmental impacts by CWISs at existing open-cycle power plants are facilities that have converted from open-cycle cooling to closed-cycle cooling using some type of "wet" cooling towers.[15] EPA's research has identified a number of facilities that have made this type of technological improvement. *See Memorandum from Sharon DeMeo, EPA, to Canal Station NPDES Permit File (May 9, 2008). See also California's Coastal Power Plants: Alternative Cooling System Analysis, Tetra Tech, February 2008.* As discussed herein and in the record for the Draft Permit, for facilities using salt water, converting to closed-cycle cooling using wet cooling towers can reduce intake flow – and attendant entrainment and impingement – by from 70 to 98 percent, depending on factors such as any restrictions on chloride discharges.[16, 17]

Thus, EPA's analysis leads to the general conclusion that converting an existing, open-cycle cooling system to a closed-cycle cooling system with wet cooling towers would be the best performing technology in this industrial category in terms of reducing entrainment and

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[15] In the Phase I CWA § 316(b) Rule, EPA also determined that entrainment and impingement mortality reductions commensurate with the use of closed-cycle cooling reflect the BTA for *new* facilities with CWISs. *See* 40 C.F.R. Part 125, Subpart I.

[16] As discussed above, the highest feasible reduction that can be achieved by closed-cycle cooling using wet mechanical draft cooling towers at Canal Station will need to be determined based on certain site-specific factors. Therefore, EPA has written the Final Permit to require the highest level of reduction that would be practicable at Canal Station, based on an optimized closed-cycle cooling system for that facility.

[17] While the use of "dry" cooling might achieve an even greater marginal reduction in entrainment and impingement, EPA has not identified a single case of a facility retrofitting from open-cycle cooling to dry cooling. Significant additional analysis would be required to determine whether a conversion to dry cooling would be feasible at Canal Station. Dry cooling, which would only achieve a relatively small additional marginal reduction in entrainment and impingement over the high end of the reduction range that can be achieved with wet cooling towers, is significantly more expensive, requires more space for installation and raises more significant noise concerns than wet cooling towers. In the absence of a single example of such a conversion ever having been implemented, EPA will not conclude that a conversion to dry cooling should provide the best performing technology benchmark for the Canal Station BTA analysis. *See also Riverkeeper, Inc. v. EPA*, 358 F.3d 174, 194-96 (2d Cir. 2004) ("*Riverkeeper I*") (upholding EPA's rejection of dry cooling as the BTA for the Phase I § 316(b) Rule addressing new facilities).

impingement.[18], [19] This conclusion provides *a starting point* for the determination of the BTA for Canal Station but is not *by itself* a determination of what the BTA should be on a site-specific basis for Canal Station. In addition, as explained above, this conclusion is plainly not a determination of the BTA for existing facilities on national, industrial category basis. Indeed, the analysis for this permit does not address the issues related to national, categorical standards.

c. Converting To Closed-Cycle Cooling Would Be the Best Performing, Practicable Technology for Canal Station

Turning to Canal Station in particular, the permit record also establishes that closed-cycle cooling would be the best performing, practicable technology for minimizing adverse environmental impacts from CWISs at the Station. Mirant/Alden and EPA both concluded that closed-cycle cooling was a practicable (or "available") technology for Canal Station and would reduce adverse environmental impacts from CWISs to the greatest degree from among the alternatives assessed.[20]

Various types of screening systems were evaluated and were infeasible (*i.e.*, were "unavailable") (*e.g.*, wedgewire screens) and/or provided uncertain and/or inferior performance (*e.g.*, fine-mesh

[18] As discussed above and in the Fact Sheet, flow reduction improvements could also be made without actually changing technology by simply reducing the amount of cooling water used by the power plant. This approach, however, would likely require either substantial generating unit outages or increased thermal discharge. The latter could indirectly require curtailed generation if permitted thermal discharge limits would be exceeded. (Indeed, as discussed above, it is expected that this would be a problem at Canal Station.) Requiring such cutbacks in generation, sometimes on a seasonal basis, has been required in some permits. *See, e.g.*, Bulletin, Marine Resources Advisory Council, Vol. IX, No. 4, "Effects of Power Plants on Hudson River Fish," (requirements for plant included scheduled plant outages); *In the Matter of Florida Power Corporation, Crystal River Power Plant, Units 1, 2 and 3, Citrus County, Florida* (Findings and Determinations Pursuant to 33 U.S.C. § 1326; NPDES Permit No. FL 0000159), p. 8. Achieving flow reductions with closed-cycle cooling, however, allows a facility to reduce entrainment and impingement while also reducing its thermal discharges and continuing to generate and sell electricity (with a relatively small energy "penalty" from lost efficiency and needing to meet cooling system needs). In this case, the permittee and EPA have evaluated intake flow reductions from pumping reductions without utilizing closed-cycle cooling, but have determined that this approach does not represent the BTA at Canal Station due to its expense and other considerations. This site-specific evaluation is discussed both above and farther below. Canal Station, however, always has the option of meeting permit limits by curtailing operations.

[19] In the Phase I CWA § 316(b) Rule, EPA also determined that entrainment and impingement mortality reductions commensurate with closed-cycle cooling with wet cooling towers reflect the BTA for new facilities with CWISs. *See* 40 C.F.R. Part 125, Subpart I (Phase I CWA § 316(b) Rule). This is secondarily supportive of the identification of closed-cycle cooling with wet cooling towers as the best performing technology for Canal Station because closed-cycle cooling at new facilities can be viewed as a "transfer technology" for existing facilities at which a retrofit would be feasible. Of course, retrofitting a technology to an existing plant is different than installing that technology at a new plant; for example, the costs, engineering considerations, and other considerations may differ substantially.

[20] EPA uses the term "practicable" here essentially as a synonym for "feasible," consistent with its dictionary definition. The *American Heritage Dictionary (2nd Ed.)* (1982), defines "practicable" as, "capable of being effected, done or executed; feasible." A technology that is impracticable or infeasible, on either technical or economic grounds, cannot reasonably be regarded to be "available," as required by CWA § 316(b). *See also Riverkeeper II*, 475 F.3d at 98-100; *Riverkeeper I*, 358 F.3d at 195.

screens, coarse mesh screens). Mirant/Alden (and EPA) also evaluated the alternative of retaining open-cycle cooling but reducing entrainment and impingement mortality by simply restricting the volume of cooling water withdrawals. This could be achieved by shutting down or throttling pumps, using variable speed pumps, or periodically curtailing generating unit (and cooling water withdrawal) operations. Mirant/Alden rejected these options, concluding that they would be more expensive than converting to closed-cycle cooling. In other words, closed-cycle cooling would be a more *cost-effective* way to achieve the same large-scale reduction in entrainment and impingement mortality associated with large-scale reductions in the volume of water withdrawals, because closed-cycle cooling would allow Canal Station to continue to generate and sell electricity without being hampered by restrictions on cooling water withdrawals.

EPA notes that Mirant/Alden's assessment of the cost of the non-closed-cycle flow reduction options appears to be based on the assumption that Canal Station operates at or near its full output capacity and that generation would need to be curtailed to avoid thermal discharge violations that would result from reduced cooling water flow. Thus, the high cost of these options seems largely based on the economic impact of extensive generation curtailment. EPA's analysis of Canal Station's electrical output for 2006, however, indicates markedly lower output than in previous years, with a capacity factor of approximately 20 percent in 2006 as compared to approximately 50 percent in 2005. Output in 2007 appears to have been similar to that of 2006. Therefore, although any required curtailment of generation to reduce the adverse effects of CWIS operations could inhibit Canal Station's generation of electricity and prove costly, the expense might be lower than previously predicted by Mirant because the facility may already have substantially curtailed generation due to other factors. *See Cape Cod Online* article entitled, "State acts to cut canal power plant operation" (April 3, 2008) (suggesting that recently approved new transmission lines could, once they are in place, lead to the elimination of off-peak operations by Canal Station, which would further reduce the facility's overall capacity factor). In any event, EPA has drafted the Final Permit to require entrainment and impingement mortality reductions comparable to levels achievable by closed-cycle cooling, but has not required the installation or use of closed-cycle cooling *per se*. Therefore, Mirant has the option of using these other flow reduction options (e.g., reduced water withdrawals, variable speed pumps) as part of its approach to complying with the Final Permit.

d. Consideration of "BAT Factors"

Having considered the elements for identifying the BTA based on the terms of CWA § 316(b) itself – i.e., that it be the "best" technology that is "available" for "minimizing" adverse environmental impacts – and having identified the best performing technology in the industry that would be practicable for use at Canal Station, EPA then looked to the factors considered in the development of BAT effluent limitations under the CWA and EPA regulations. According to 40 C.F.R. § 125.3(c)(2)(i), in setting effluent limits on a BPJ basis, EPA should consider on a case-by-case basis the "appropriate technology for the category of point sources of which the applicant is a member, based on all available information." Such consideration is not the equivalent of EPA actually determining the BAT for a national effluent guideline (NEG). It is

simply a case-by-case consideration based on available information that is factored into the development of each particular BPJ, site-specific BAT limit.[21]

In this case, as explained above, EPA concludes that from the standpoint of reducing entrainment and impingement mortality, converting to a closed-cycle cooling system using wet cooling towers would *generally* be the best performing technology for existing power plants with once-through cooling systems. Therefore, this technology sets the performance benchmark for this BTA determination and for the limited purpose of this BPJ determination, EPA concludes that this technology would represent the "appropriate technology" for the industrial category of which Canal Station is a member (*i.e.*, existing power plants with once-through cooling systems). *See* 40 C.F.R. § 125.3(c)(2)(i). This is not, however, determinative of the BTA Canal Station because other factors such as, for example, any secondary air pollution, energy or noise effects must also be considered in reaching the ultimate BTA determination.

It is important to emphasize, once again, that this is not a finding of what would constitute the BTA on a national, industrial category-wide basis. For this permit analysis, EPA is only making a site-specific BTA determination and is not making any sort of determination or undertaking an analysis of what would constitute the BTA on a national, industrial category-wide basis. Although converting to a closed-cycle cooling system using wet cooling towers is *generally* the best performing technology for reducing entrainment and impingement mortality at existing power plants with once-through cooling systems, converting to closed-cycle cooling might not be the BTA for the entire category of existing power plants for any number of reasons (*e.g.*, another technology is more "cost-effective"). This BPJ permit determination for Canal Station does not, and need not, evaluate all the relevant factors for the entire category of facilities nationally. Thus, any BPJ determination that converting to closed-cycle cooling using wet cooling towers represents the BTA for Canal Station does not represent a determination regarding the BTA for any other facility, much less for an entire category of facilities.[22]

The regulations for the development of effluent limitations also indicate that EPA's case-by-case analysis must consider "any unique factors relating to the applicant." 40 C.F.R. § 125.3(c)(2)(ii). With regard to such "unique factors," EPA notes that the record for this permit shows that converting Canal Station to closed-cycle cooling would be practicable from an engineering standpoint and that the facility has adequate space to install wet mechanical draft cooling towers for such a conversion. In addition, the record shows that a conversion to closed-cycle cooling would achieve a 70-98 percent reduction in intake flow (and entrainment and impingement), and

[21] *See Texas Oil & Gas Ass'n*, 161 F.3d at 929 (under 40 C.F.R. § 125.3, "EPA must determine on a case-by-case basis what effluent limitations represent the BAT level, using its 'best professional judgment.' Individual judgments thus take the place of uniform national guidelines, but the technology-based standard remains the same.") (citation omitted).

[22] Indeed, EPA earlier made an industrial category-wide BTA determination for large, existing power plants in promulgating the Phase II Rule, but that determination was later remanded to the Agency by the Second Circuit in *Riverkeeper II* and, as a result, the Agency has now suspended the Rule. The Agency now expects to reconsider the question of the appropriate BTA for the entire category of facilities in a new Phase II Rule. EPA's facility-specific, BPJ decision for Canal Station in no way predetermines the answers to any of the questions that the Agency may address in its reconsideration of the BTA question for any new national Phase II Rule.

would be economically practicable.[23] The record also indicates that the performance that the various intake screening technologies could achieve at Canal Station is uncertain. Specifically, the level of entrainment reduction they would achieve is uncertain, as is the degree to which formerly entrained organisms would survive being impinged on the screens of a new system. Thus, *the current record* supports a finding that *for this facility*, intake screens would not achieve comparable performance to that of closed-cycle cooling.[24]
In addition, CWA §§ 301(b)(2)(A) and 304(b)(2)(B) and EPA regulations at 40 C.F.R. §§ 125.3(c)(2) and 125.3(d)(3) dictate that in setting BPJ-based BAT effluent limits certain additional factors be considered. These factors are: (1) the age of the equipment and facilities involved, (2) the process employed, (3) the engineering aspects of applying various control techniques, (4) process changes, (5) cost, and (6) non-water quality environmental impacts (including energy issues). It is also appropriate to consider these factors in determining the BTA on a case-by-case basis under § 316(b). *See Riverkeeper II*, 475 F.3d at 97-98; *Riverkeeper, Inc., et al. v. United States EPA*, 358 F.3d 174, 186, 195 (2d Cir. 2004) ("*Riverkeeper I*").[25] EPA's consideration of these factors is set forth below. For the most part, this analysis was already presented in the record for the Draft Permit, though the Draft Permit analysis has been supplemented in certain respects in response to public comments.

The CWA sets up a loose framework for assessing the statutory factors in setting BAT limits.[26] It does not require their comparison, merely their consideration.[27] "[I]n enacting the CWA,

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[23] Given that Canal Station is estimated to entrain between 2.6 billion and 3.6 billion eggs, and between 187 million and 318 million larvae annually, and to impinge over 71,000 individuals annually, this technology could (a) prevent the entrainment of somewhere between 1.82 billion eggs [2.6 billion x 70 percent] to 3.528 billion eggs [3.6 billion x 98 percent] eggs, and between 130,9 million [187 million x 70 percent] and 311.6 million larvae [318 million x 98 percent], as well as (b) prevent the impingement of from 49,700 to more than 69,580 adult and juvenile fish.

[24] As noted above, the permit writer developing BAT limits on a site-specific, BPJ basis applies the same performance-based approach to an individual point source that EPA applies to whole categories and classes of point sources when it develops effluent limitations guidelines (ELGs). *See NRDC v. EPA*, 859 F.2d at 201("in establishing BPJ limits, EPA considers the same statutory factors used to establish national effluent guidelines. BPJ limits thus represent the level of technology control mandated by the CWA for the particular point source."); *Trustees for Alaska v. EPA*, 749 F.2d 549, 553 (9th Cir. 1984) (EPA must consider statutorily enumerated factors in its BPJ determination of effluent limits); *U.S. EPA Permit Writers' Manual (EPA-833-B-96-003) (Manual) at p. 70 (1996). See also NRDC v. EPA*, 863 F.2d at 1425 ("courts reviewing permits issued on a BPJ basis hold EPA to the same factors that must be considered in establishing the national effluent limitations" (citations omitted)).

[25] *Cf. NRDC v. EPA*, 863 F.2d at 1425 ("in issuing permits on a case-by-case basis using its 'Best Professional Judgment,' EPA does not have unlimited discretion in establishing permit limitations. EPA's own regulations implementing [CWA § 402(a)(1)] enumerate the statutory factors that must be considered in writing permits.").

[26] BP Exploration & Oil, Inc., 66 F.3d at 796, *citing* Weyerhauser v. Costle, 590 F.2d 1011, 1045 (D.C. Cir. 1978) (citing Senator Muskie's remarks on CWA § 304(b)(1) factors during debate on CWA). See also EPA v. Nat'l Crushed Stone Ass'n, 449 U.S. 64, 74, 101 S.Ct. 295, 300, 66 L.Ed.2d 268 (1980) (noting with regard to BPT that "[s]imilar directions are given the Administrator for determining effluent reductions attainable from the BAT except that in assessing BAT total cost is no longer to be considered in comparison to effluent reduction benefits").

[27] Weyerhauser v. Costle, 590 F.2d at 1045 (explaining that CWA § 304(b)(2) lists factors for EPA "consideration" in setting BAT limits, while CWA § 304(b)(1) lists both factors for EPA consideration and factors for EPA

'Congress did not mandate any particular structure or weight for the many consideration factors. Rather, it left EPA with discretion to decide how to account for the consideration factors, and how much weight to give each factor.'"[28]
In sum, when EPA considers the statutory BAT factors in setting effluent limits, it is governed by a standard of reasonableness.[29] It must consider each factor but has "considerable discretion in assessing them and determining the weight to be accorded to each in reaching an ultimate BAT determination."[30] One court summarized the standard for judging EPA's consideration of the BAT factors in setting effluent limits as follows: "[s]o long as the required technology reduces the discharge of pollutants, our inquiry will be limited to whether the Agency considered the cost of technology, along with other statutory factors, and whether its conclusion is reasonable."[31] EPA's consideration of each factor for this BTA determination under CWA § 316(b) is set forth below.

(i) The age of equipment and facilities involved

In determining the BTA for Mirant Canal Station in both the Draft and Final Permits, EPA considered the age of the equipment and facilities involved. Canal Station is an older, existing power plant. Units 1 and 2 first came online in 1968 and 1976, respectively.

Section 5.2.3 of the Fact Sheet discusses six potential alternatives for reducing impingement mortality and entrainment at the plant. These options were identified by Mirant/Alden[32] for further evaluation because they were considered commercially available, practicable from an engineering standpoint, and potentially effective for reducing entrainment and impingement

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"comparison" -- *e.g.*, "total cost versus effluent reduction benefits" -- in setting BPT limits). *See also* Nat'l Crushed Stone Ass'n, 449 U.S. at 74 (1980).

[28] BP Exploration & Oil, Inc., 66 F.3d at 796, *citing* Weyerhauser v. Costle, 590 F.2d at 1045.

[29] Id., 66 F.3d at 796, *citing* American Iron & Steel Inst. v. EPA, 526 F.2d 1027, 1051 (1975), *modified in other part*, 560 F.2d 589 (3d Cir. 1977), *cert. denied*, 435 U.S. 914, 98 S.Ct. 1467, 55 L.Ed.2d 505 (1978).

[30] Texas Oil & Gas Ass'n, 161 F.3d at 928, *citing* NRDC v. EPA, 863 F.2d at 1426. See also Weyerhauser, 590 F.2d at 1045 (discussing EPA's discretion in assessing BAT factors, court noted that "[s]o long as EPA pays some attention to the congressionally specified factors, the section [304(b)(2)] on its face lets EPA relate the various factors as it deems necessary").

[31] Ass'n of Pacific Fisheries v. EPA, 615 F.2d 794, 818 (9th Cir. 1980) (industry challenge to EPA regulations implementing BAT limits for seafood processing industry point sources). See also Chemical Manufacturers Ass'n (CMA) v. EPA, 870 F.2d 177, 250 n.320 (5th Cir. 1989), *citing* Congressional Research Service, A Legislative History of the Water Pollution Control Act Amendments of 1972 at 170 (1973) (hereinafter "1972 Legislative History") (in determining BAT, "'[t]he Administrator will be bound by a test of reasonableness.'") (industry challenge to EPA regulations implementing BAT limits for organic chemicals, plastics and synthetic fibers industry point sources); NRDC v. EPA, 863 F.2d at 1426 (same); American Iron & Steel Inst., 526 F.2d at 1051 (same).

[32] Alden Research Laboratory, Inc. "Evaluation of Fish Protection Alternatives for the Canal Generating Station." October 2003.

mortality. Neither EPA nor Mirant/Alden found any indication that the age of the equipment and facilities involved precluded the use of any of the specified technologies at Canal Station. Obviously, retrofitting new technology to the existing power plant raises various construction and engineering issues, but these issues were assessed and did not render any of the technologies impracticable.

Moreover, viewed from another perspective, the age of the facility's once-through cooling system (30 to 40 years of operation) could be regarded to support the appropriateness of upgrading the system at this time. Investments in constructing the existing CWIS were made decades ago, the equipment has likely surpassed its originally expected useful life, and technological advances have occurred since its installation. As a result, from this perspective, it would seem reasonable to upgrade the equipment at this time.

(ii) The process employed

In determining the BTA for the Draft and Final Permits for Mirant Canal Station, EPA considered the process employed at the facility. Mirant Canal Station is an 1120 MW, fossil fuel-burning, steam-electric power plant with the primary purpose of generating electrical energy. The facility currently uses a once-through cooling system which withdraws cooling water from the Cape Cod Canal, resulting in significant entrainment and impingement of marine organisms. Therefore, EPA considered technological approaches that could reduce these adverse environmental impacts without interfering with the generation of electricity using the steam-electric process and the burning of fossil fuels.

EPA considered options that would reduce both entrainment and impingement, including various intake screening systems, reduced water withdrawals from pumping restrictions, and shifting to closed-cycle cooling. EPA also considered various approaches that would only reduce impingement mortality (without addressing entrainment), including improved fish return systems, coarse-mesh screens, and other technological improvements. None of these options would prevent the continued operation of the facility as a fossil fuel-burning, steam-electric power plant with the purpose of generating electricity for sale. Ristroph and wedgewire screens would not affect the facility's electrical output, while retrofitting the plant with a closed-cycle cooling system would result in only a small marginal reduction in annual output of approximately 11 MW. The facility's output capacity could be substantially restricted, however, by the option involving reduced cooling water intake pump capacity coupled with continued open-cycle cooling system operations. This is because reducing cooling water volumes while operating in an open-cycle mode would necessitate significant generating restrictions to avoid violations of thermal discharge limits. Of course, if the facility has already curtailed its generation for other reasons, it might decide that meeting the Final Permit's limits by reducing water withdrawals (and perhaps by using variable speed pumps), without converting to closed-cycle cooling, would be the most cost-effective approach.

EPA's decision that closed-cycle cooling represents the BTA for Canal Station takes account of the processes used at the facility and allows the permittee to maintain its primary production

process, though the use of closed-cycle cooling would result in a small marginal reduction in the facility's electrical output.

(iii) The engineering aspects of the application of various control techniques

In determining the BTA for the Draft and Final Permits for Mirant Canal Station, EPA considered the engineering aspects of implementing various technologies for reducing adverse environmental impacts from the facility's CWISs. Mirant/Alden's evaluation assessed the feasibility of each technology from an engineering standpoint and these engineering considerations were further evaluated by EPA in Section 5.2.3 of the Fact Sheet.

EPA determined that wedgewire screens present several engineering difficulties that currently render the technology impracticable for use at Canal Station unless they are resolved. This determination was based on recommendations from the United States Army Corps of Engineers. Specifically, the Corps of Engineers -- which is responsible for maintaining safe operation of the Cape Cod Canal – presently believes that this technology cannot be utilized because it would interfere with navigation in the Canal. In addition, the Corps expressed the view that icing could impede the use of this technology. While EPA did not conclude that wedgewire screens would be the BTA for Canal Station, the Final Permit does not preclude the possibility that solutions could be found for these engineering issues. The Final Permit, instead, includes a performance standard for entrainment reduction that may be met with either cooling towers or any other technology (including wedgewire screens) that is capable of being implemented and achieving comparable performance.

In Alden's report, Ristroph screens (with either fine mesh or coarse mesh), reducing the capacity of cooling water pumps, and retrofitting the facility with a closed-cycle cooling system were all determined to be feasible options in light of the engineering considerations. EPA agrees that these options would be feasible from an engineering standpoint.

In addition, EPA considered the engineering aspects of the existing CWISs at Canal Station and determined that the location of the existing fish return does not constitute the BTA for limiting impingement mortality. The existing fish return system, which discharges both fish and debris, is the original discharge flume from Unit 1. The discharge point is located between the existing intakes, which increases the probability that fish will become re-impinged. In addition, at low tide levels, the end of the fish return trough is suspended several feet over the surface of the water so that returned fish must drop vertically through the air into the receiving water and are thus more susceptible to opportunistic predation by gulls and other fish-eating birds. The large vertical drop and the heightened probability of re-impingement due to the location of the outfall, warrant improvements to the fish return system to ensure that impingement mortality is minimized. These engineering considerations are reflected in the Final Permit's requirements for CWIS design modifications to relocate the fish return system and prevent returned fish from being dropped vertically through the air. It should be underscored that Part I.A.1.h of the existing permit already provides that "[A]ll live fish, shellfish, and other aquatic organisms collected or trapped on the intake screens shall be returned to water of ambient temperature sufficiently distant from the intake structures to prevent reimpingement…." Thus, operating the facility's fish return system so as to avoid fish being re-impinged is not a new requirement. The new,

specific requirements for CWIS design modifications are necessary, however, because Canal Station's current fish return system does not appear to satisfy the existing permit condition.

(iv) Process changes

In determining the BTA in the Draft and Final Permits for Mirant Canal Station, EPA also considered any process changes that would accompany each technology. Modifying the operation of the intake screens so that they are rotated during chlorination and preventing chlorinated condenser water to enter the fish return flume (outfall 002) are two process changes that will not affect the facility's power generating or cooling processes. Likewise, Ristroph and wedgewire screens installed to reduce impingement and entrainment would impact only the design of the CWIS without altering the facility's power generating or cooling processes. Reducing the capacity of the circulating water pumps without modifying or replacing the existing CWISs would not change the facility's processes but would restrict Canal Station's ability to generate electricity because reduced generation would be necessary to avoid violations of the permit's thermal discharge limits. Mirant/Alden estimated a net annual loss of 672 MW as a result of such reduced generation, apparently based on the assumption that the facility operates at full output. This appears to represent a substantial overestimate, however, because, as discussed herein, Canal Station has already significantly reduced its generation for reasons unrelated to its NPDES permit.

Retrofitting the plant with closed-cycle cooling towers would not interfere with the facility's operation as a fossil fuel-burning steam electric power plant – though it would somewhat reduce plant efficiency – but it would change the facility's current open-cycle cooling process. In addition, retrofitting the facility with cooling towers would not interfere with plant operations during construction, but would, according to Mirant/Alden, require a 6-month shutdown during the implementation of intake and circulating water pipe modifications. Assuming that six months is a reasonable estimate of shutdown needs, EPA notes that the schedule for modifications could potentially be structured so that at least one of the facility's generating units could remain available for operation at all times. In addition, it would, if necessary, be possible to plan an implementation schedule so that any shutdowns would occur outside of peak demand/generation periods.

(v) Cost of measures for reducing entrainment and impingement mortality

In determining CWIS requirements for Canal Station under CWA § 316(b), EPA considered the cost of the various technological alternatives under consideration. EPA considered whether the cost of each option would be feasible for Mirant to undertake. This is relevant for determining whether a particular alternative is actually "available" for Canal Station and is consistent with the requirement that cost be considered in developing BAT effluent discharge standards under 40 C.F.R. § 125.3(d)(3)(v). EPA considered estimated costs for each potential technology as presented in Mirant/Alden's evaluation of fish protection technologies for Canal Station. Section 5.2.3 of the Fact Sheet further considered estimated construction, operating, and maintenance costs associated with implementing fish protection technology.

With regard to screening systems for reducing entrainment and impingement, the Mirant/Alden report estimated the cost for expanding the intake and installing fine-mesh Ristroph screens to be $10.4 million and the cost for wedgewire screens to be approximately $11.2 million. These technologies could substantially reduce impingement of juvenile and adult fish. They could also reduce entrainment of eggs and larvae but the extent of that reduction was unclear. Moreover, to the extent that these technologies do prevent entrainment, they would do so by impinging them on the new barriers and the extent to which these tiny, delicate organisms would survive this impingement is unclear. Therefore, the actual benefit of these systems in preventing the mortality of formerly entrained organisms is unclear. Coarse-mesh Ristroph screens and barrier nets were substantially less expensive, with estimated costs around $2.3 million, but neither would be effective for reducing entrainment. Likewise, the various fish return system modification requirements proposed in the Draft Permit would have no effect on entrainment levels but would be far less expensive than the entrainment reduction technologies.

Alden estimated that reduced circulating water pump operation during periods of high entrainment could be undertaken to achieve a 60 percent reduction in entrainment, but, as discussed above, it would necessitate curtailed generation. Mirant/Alden estimated the annual energy replacement cost for this option to be approximately $162 million, making it the most expensive of the options evaluated. As also discussed above, EPA believes this cost estimate was based on the assumption that the facility operates at full output capacity year-round, something it has not done in recent years. Therefore, this option may actually be significantly less expensive, based on the cost of replacement power, than Mirant/Alden estimated. Nevertheless, relying solely on reduced cooling water withdrawals from the Cape Cod Canal to reduce entrainment and impingement could place a ceiling on the facility's ability to generate electricity.

Finally, retrofitting Canal Station with closed-cycle wet mechanical draft cooling towers was estimated by Mirant/Alden to reduce water withdrawals, and corresponding entrainment and impingement levels, by from 70 to 98 percent, with estimated *total* capital costs of approximately $108 million,[33] with an estimate of approximately 4,838,400 MWh of generation lost due to a predicted 6-month outage related to intake and "final circulating water pipe modifications." *See* Alden Report at 4-11 to 4-12.[34] In addition, Mirant/Alden estimated

[33] In its comments on the Draft Permit, Mirant referred to a cost of $122.2 million without explaining the basis of this number or how it related to the $108 million figure from the Alden Report. EPA notes that adding the Alden's estimated capital costs ($108,251,000), annual O&M costs ($2,165,000) and "power penalty" costs ($11,807,000) yields a sum of $122,223,000 (or, rounded off, $122.2 million). Therefore, this appears to EPA to be the basis of the $122.2 million figure cited by Mirant. This total cost figure could, of course, be converted to an annualized figure spread across the 20-30 years expected useful life of the equipment and taking into account appropriate factors such as discount rates. While Mirant's comments combine the capital costs and annual expenditures into one figure, EPA's discussion herein discusses the capital costs and annualized expenditures separately in order to explain them in more detail and to note the difference between total capital costs and annualized expenditures.

[34] In the Fact Sheet, at 44, EPA stated the following:

> (EPA notes that Alden did not appear to quantify certain costs of Alternative 6, such as the cost of lost generation during any construction-related plant shutdowns. Therefore, this comparison of costs between the alternatives may warrant refinement in the future.)

approximately $2.1 million in *annual* operations and maintenance costs. Finally, Mirant/Alden also estimated an *annual* cost of $11,807,000 for "replacement power" to reflect the loss in saleable electricity resulting from (a) the need to provide 116,557 MWh for operating the closed-cycle system (*e.g.*, to run cooling tower fans), and (b) the loss of 98,112 MWh due to reduced generating efficiency as a result of using cooling towers. This reflects a 1.2 percent and a 1.0 percent loss for cooling system energy needs and lost efficiency, respectively.

Regarding the affordability for Mirant of the Final Permit's BTA requirements, EPA believes the cost of implementing any of the potential technologies can reasonably be borne by Mirant, including the cost of retrofitting closed-cycle cooling towers at the Station. Since Mirant has emerged from bankruptcy, it has been a profitable company, and should be able to afford the expense associated with mandated technology for NPDES compliance. Company financial reports released on August 9, 2007, indicated an adjusted net income of $291 million for the first 6 months of 2007, and Earnings Before Income Taxes, Depreciation and Amortization (EBITDA) of $451 million. (Source - Mirant Corporation Second Quarter 2007 Earnings Release.) Although these numbers reflect the sale of some business units, the company demonstrates upward trends in profitability with adjusted quarterly EBITDA increasing by 177% between the second quarters of 2006 and 2007. Thus, while Mirant points out that EPA found that closed cycle cooling "is not economically practical for many existing Phase II facilities" when EPA adopted the now-suspended Phase II regulations, s*ee* 69 Fed. Reg. 41601 (July 9, 2004), Mirant's comment also correctly indicates that EPA did not determine that this technology would be economically impracticable for *all* large, existing power plants. For this permit decision, EPA has applied its best professional judgment and concluded that this technology is economically practicable for Mirant Canal Station. Meanwhile, Mirant has not presented any argument to the contrary, either in the Alden report or in its comments on the Draft Permit.

Furthermore, EPA also concludes that Mirant/Alden may have overestimated the cost of such a retrofit for the reasons discussed below. Mirant/Alden's figures for an installation-related outage appears to assume that the facility is operating at 100 percent of its output capacity, whereas the Alden report itself indicates the facility had typically been operating at a 48 percent capacity factor, *see* Alden Report at 2-2 and 2-6. Furthermore, as discussed both above and below (see discussion of energy effects), more recent information indicates that the facility operated at an approximately 20 percent capacity factor in 2006 and may operate even less in the future. Therefore, it is possible that a substantially lower capacity factor assumption would be more realistic and would reduce the estimated energy cost of a closed-cycle cooling system and the estimated amount of lost generation due to generating efficiency reductions associated with closed-cycle cooling. It might also reduce estimated operations and maintenance expenses because Mirant/Alden assumed the plant was running at 100 percent of capacity in its estimates for these cost factors. Of course, if Canal Station's capacity factor is reduced, its profits are also likely to be decreased, though profits will ultimately be determined by numerous factors, including the facility's production costs and the prices it receives for the electricity it does sell.

See also id. at 46 (stating that cooling tower retrofit costs require further evaluation). As discussed here, EPA now realizes that the Alden Report does address the issue of the cost of potential lost generation associated with a cooling tower implementation outage.

While the cost of each of the above technologies would be practicable for Mirant to incur, the Final Permit provides the Permittee with the flexibility to choose the most cost-effective technology for achieving impingement mortality and entrainment reductions comparable to those that would be attained by a closed-cycle cooling system that has been optimized for maximizing reductions in intake flow at Canal Station. For example, if Mirant decided that it could meet the permit's limits by reduced cooling water intake pumping, without cooling towers, the permit allows the Permittee to make that choice. The screening system options discussed above are less expensive than closed-cycle cooling but according to the current record would not reduce entrainment at Canal Station to a degree comparable to the reductions that would be achieved with closed-cycle cooling.

It should again be emphasized that while EPA Region 1 has concluded, based on the record before it for this case-by-case BPJ permit decision, that cooling towers are the BTA for minimizing adverse environmental impact at Canal Station, EPA based its decision in part on Mirant's acknowledgment that cooling towers are economically achievable for it. EPA's action in this permit proceeding should not be construed as limiting the scope or result of its BTA analysis in subsequent proceedings. For example, in subsequent proceedings, EPA may base its BTA determinations on consideration of additional technologies, taking into account the cost and effectiveness of such technologies in reducing impingement and entrainment. Future BPJ determinations will be driven by the facts of each case and any new regulations promulgated in the future will govern the conditions of any permits to which they apply.

(vi) Non-water quality environmental impacts (including energy requirements)

EPA also considered the "non-water" environmental impacts associated with the implementation of the various technological alternatives for reducing adverse environmental impacts from Canal Station's CWISs. These non-water impacts are discussed below and include energy effects, air emissions, salt dispersion, water vapor plume emissions, noise, and visual impacts. EPA's evaluation of these issues included, among other things, consideration of Mirant's comments on the Draft Permit and Alden's earlier assessment of these non-water quality environmental impacts, as well as consideration of past analyses of the non-water environmental impacts associated with using mechanical draft cooling towers at Canal Station that were conducted for the Canal Station Redevelopment Draft and Final Environmental Impact Reports for Unit 3 and Unit 2.[35]

According to Alden's assessment, the implementation of Ristroph or wedgewire screens would not impact energy consumption or air emissions, and would not contribute to noise or visual impacts beyond those of the existing intake structures. The construction and operation of the fish return enhancements required by the new Permit also are not expected to contribute to noise, visual impacts, energy effects or other non-water environmental impacts.

[35] TRC 1998. Canal Unit 3/Canal Station Redevelopment Draft Environmental Impact Report/Development of Regional Impact. December 1998 *and* TRC 2000, Canal Redevelopment Project Final Environmental Impact Report/Development of Regional Impact. January 2000.

Alden's evaluation stated that retrofitting Canal Station with wet mechanical draft cooling towers could adversely affect visual aesthetics (from the cooling towers and from visible water vapor plumes), local sound levels, wastewater disposal, solid waste disposal, and air emissions (as a result of increased fuel consumption and salt drift). In its comments on the Draft Permit, Mirant stated broadly that "this option raises a number of environmental concerns, including creation of a fog bank in the area of the plant (and associated road hazards to navigation), noise impacts, aesthetics, creation of drift and solid waste, and others." Yet, Mirant/Alden's broad statements of concern neither declare nor establish that any of these areas of concern constitute insurmountable obstacles to retrofitting Canal Station with cooling towers.

EPA has considered these issues and determined that the "non-water considerations" do not involve impacts significant enough to prevent designating closed-cycle cooling as the BTA for Canal Station, and that it is likely that any such impacts can be sufficiently controlled with appropriate abatement measures. Therefore, EPA finds that these issues do not preclude its determination that retrofitting Canal Station with wet cooling towers constitutes the BTA for the facility.

Nevertheless, EPA's Final Permit does not mandate installation of closed-cycle cooling. It allows the Permittee to utilize any technology that can achieve entrainment and impingement reductions comparable to what would be achieved with closed-cycle cooling or, instead, to seek a permit modification if it believes that further analysis establishes that a different BTA determination is warranted.

Visual Aesthetic Effects from New Structures

Alden predicted that a mechanical draft cooling tower would "significantly diminish the aesthetics of the area around the plant due to the size of the tower and the visible plume." Based on the Canal Redevelopment Plan, a mechanical draft wet cooling tower at Canal Station would be 60 to 70 feet tall and would be visible from Scusset Beach and Sandwich Marina. This estimate is consistent with EPA's analysis for other facilities as well. *See* EPA Region 1 Draft Permit Determinations Document for Brayton Point Station NPDES Permit (July 2002), at 7-44. A natural draft cooling tower would likely be considerably taller. A recent proposal to use natural draft cooling towers at Brayton Point Station involves cooling towers estimated to be up to 500 feet high. *See The Herald* News article entitled, "Dominion's big plans" (Jan. 22, 2008); *Providence Journal* article entitled, "Brayton Point cooling towers are on the horizon" (Jan. 23, 2008).

EPA concludes, however, that a cooling tower system is not inconsistent with the industrial aesthetic of the existing power plant. Mechanical draft cooling towers should not present a major issue given that the existing exhaust tower at the facility is much higher, at over 400 feet tall. EPA agrees that cooling towers would add additional visible industrial facilities to Canal Station, but this marginal addition to the facility's already substantial industrial equipment should not be regarded as a highly significant, unacceptable impact when the environmental benefits of reduced entrainment and impingement are considered. EPA also notes that the EIRs prepared on past proposals to repower or add generating units to Canal Station did not rule out

major additional industrial equipment at Canal Station on aesthetic grounds. EPA discusses the visible plume issue below.

EPA also notes that a natural draft cooling tower system would involve greater aesthetic impacts because the towers would be substantially taller and visible from greater distance, though the installation would likely have a smaller footprint on the ground. Nevertheless, natural draft cooling towers would not be clearly unacceptable on aesthetic grounds given the preexisting industrial nature of the site, the preexisting tall stacks at the facility, and the large reductions in entrainment and impingement that the technology would achieve.

Water Vapor Plume Effects (Transportation Safety, Icing, Visual Aesthetics)

Another issue to be considered with regard to using mechanical draft, wet cooling towers is whether there will be emissions of mist (*i.e.*, water droplets) or water vapor that could cause transportation hazards on nearby roadways or on the Cape Cod Canal due to fogging or icing. Ensuring public health and safety is the highest priority for EPA and this issue required careful consideration. The Alden Report, at 4-11, states that:

> ... mist eliminators and plume abatement measures would be necessary to reduce cooling tower drift and minimize impacts on transportation (shipping, highways, and railroad). For this reason, Canal Station would be classified as a difficult site relative to EPRI's cooling tower cost methodology.

Thus, the potential for these types of impacts was a key reason that the Alden Report based its cost estimates for mechanical draft cooling towers on the highest level identified by EPRI for "difficult sites." The Alden Report also states in Appendix B, at B-4, that for mechanical draft cooling towers, visible water vapor plumes can extend downwind 500 to 1000 feet especially during colder weather and could lead to road icing under certain conditions. In addition, the Alden Report states that drift dispersion from mechanical draft towers is "very local," that it can be limited to less than 6 gpm by modern drift eliminators, and that "salt deposition and saline air concentrations are usually relatively small and remain mostly within site boundaries."

Based on current information, EPA's assessment of the fogging/icing traffic safety issue is that it is highly uncertain whether a significant problem would arise if mechanical draft cooling towers are installed at Canal Station, but that there are ways to eliminate any problems that do occur. Methods for managing this potential problem are discussed below, along with the uncertainties surrounding the magnitude of the problem.

Cooling towers can, as the Alden Report states, be equipped with highly efficient mist (or "drift") eliminators that can nearly eliminate the emission of water droplets (and salt) from a wet mechanical draft tower. Such drift eliminators can achieve a drift rate of 0.0005%, which would represent only a very small marginal increase over the moisture naturally in the air in a coastal environment such as the area around Canal Station. *See* EPA Region 1 Draft Permit Determinations Document for Brayton Point Station NPDES Permit (July 2002), at 7-46. *See also* 39 Fed. Reg. 36189 (October 8, 1974). As a result, mist emissions should not significantly

contribute to fogging or icing. The Mirant/Alden discussion quoted above is consistent with this conclusion.

As the Permittee indicates, however, mechanical draft wet cooling towers also emit a "plume" of water *vapor* (as opposed to *mist*). Under certain meteorological conditions, this water vapor could condense and contribute to ice on road surfaces and/or fog. (It should be noted that mist and water vapor emission issues are generally considered to be less with natural draft cooling towers due to the greater dispersion achieved by the taller cooling towers.)

EPA has looked at the water vapor plume/safety issue from a number of perspectives. Most importantly, EPA has concluded that to the extent any traffic safety issue may exist, there are several ways it could be adequately controlled. First, as the Permittee has indicated, a cooling tower and associated generating unit could, if necessary, be shut down briefly to avoid safety issues. Indeed, since the facility already operates at a capacity factor of less than 50 percent (see discussion of capacity factors both above and below), one or both generating units might well already not be operating during any periods that meteorological conditions could possibly produce a traffic safety issue. Second, instead of shutting units down, it might be feasible to develop an early warning system according to which the Permittee would notify the Massachusetts Highway Department or local public works departments to initiate icing controls (*e.g.*, road salting) or activate lighted cautionary signs warning of potential fog or icing conditions when it is predicted that cooling tower operations are likely to contribute to potentially hazardous fog or ice conditions. *See* EPA Region 1 Draft Permit Determinations Document for Brayton Point Station at 7-48. It is also, of course, possible that this type of traffic safety program already exists in an area like that surrounding Canal Station (*i.e.*, a New England coastal environment that periodically experiences humid air, fog and cold weather).

Third, if deemed necessary, there are also plume abatement technologies that can be utilized with mechanical draft cooling towers to substantially reduce or eliminate vapor plumes. These technologies are generally referred to as "wet/dry" or "hybrid" cooling towers. *See* Alden Report, App. B at B-2, B-6; EPA Technical Development Document (TDD) 2001- New Facilities, p. 3-33; January 4, 2002, Phone Memo from Sharon Zaya, EPA, Regarding Call with Ken Daledda, Bergen Station, New Jersey; Materials obtained from Marley Cooling Technologies, Inc.; Public Service Commission of Wisconsin/Wisconsin Department of Natural Resources, Final Environmental Impact Statement, Badger Generating Company, LLC, Electric Generation and Transmission Facilities (June 2000, 9340-CE-100), Executive Summary, p. xii; "AES Londonderry Highlights" (p. 6 of 7) (AES, Inc., 1/18/02). The Alden Report, as quoted above, states that "plume abatement measures" will be necessary. It is not clear from this statement, and the other text in the report, whether Alden is opining that hybrid cooling towers will be necessary or only that some sort of abatement measure(s) will be needed.

In any event, the equipment costs for hybrid cooling towers are larger than for traditional cooling towers and the loss in electrical generating efficiency is also somewhat larger. Past EPA assessments have estimated that adding plume abatement capability could more than double the *capital cost* of the cooling towers. *See* EPA Region 1 Draft Permit Determinations Document for Brayton Point Station at 7-49. EPA has also estimated, however, that "... the increase in *overall project costs* for a [retrofitted] hybrid wet/dry cooling tower unit over a wet (only) unit

would range between 20 and 65 percent." EPA TDD 2002- Existing Facilities, p. 6-6 (emphasis supplied). EPA further notes that Power Tech Associates, a consultant who estimated the cost of cooling system conversion for Hudson River power plants, states that "the effect of using wet/dry towers is much less than a 25 percent increase in the overall conversion costs." Id. p. 6-6. It appears that the Alden Report may have already accommodated this possibility in its cost estimates by using the highest EPRI cost projections for difficult sites, as stated above.

In any event, it remains highly uncertain that cooling towers with plume abatement equipment will be needed. In the coastal environment of the Cape Cod Canal, local roads and highways already periodically experience icing and fogging from natural conditions which is managed by existing road and marine safety programs. While adding cooling towers at Canal Station might marginally increase fog and icing over background conditions, any such increase is likely to be well within the range of natural fluctuation in background conditions. *See* EPA Region 1 Draft Permit Determinations Document for Brayton Point Station at 7-51.

In addition, while the Alden Report states that a visible plume might extend from 500 to 1000 feet from the cooling towers under certain meteorological conditions, an estimate consistent with other estimates EPA has seen, *id.*, no highways or bridges are within that distance of Canal Station. Only a few local roads and the Cape Cod Canal are within that distance and, again, it would seem that existing programs and techniques for dealing with these types of issues are likely to be adequate. In addition, EPA has found that experience at other plants does not seem to corroborate the notion that cooling towers at Canal Station are likely to present a significant traffic safety hazard. *See id.* at 7-50 to 7-51 (discussing experience at a number of power plants with closed-cycle cooling tower systems).

With regard to the aesthetic effects of a visible water vapor plume, Mirant/Alden explained that visible plumes can occur during periods of cooler temperatures, high relative humidity and low winds. Mirant/Alden also stated that such a plume can extend downwind from 500 to 1000 feet during the colder seasons. Again, this small marginal increase does not seem a significant impact from an aesthetics standpoint given the short reach of such a plume, the relative infrequency of the occurrence of such a plume, and the fact that the area is already subject to coastal fog conditions. Furthermore, any public aesthetic concern might be lessened if it was understood that any such plume consisted of water vapor resulting from the use of technology installed to protect marine life, and did not involve the emission of ozone precursors, air toxics or carbon dioxide.

Salt Drift

With any salt water cooling tower, the issue of salt emissions from the towers must be considered. This should not be a significant problem at Canal Station, however, because the towers can be equipped with drift eliminators that reduce drift to 0.0005%. *See* EPA Region 1 DPDD for Brayton Point Station at 7-52 to 7-53. Any drift would only travel a small distance and would likely increase salt deposition and saline air concentrations by only a very small amount over ambient coastal conditions. *See id.;* Alden Report at B-4. Of course, any cooling towers installed and operated at Canal Station will have to comply with applicable air emission requirements, including regulations on particulate emissions.

Energy Effects

Mirant/Alden estimated that the net loss of saleable power would be 2.2 percent of total plant output (1.2 percent for auxiliary power needs and 1 percent due to efficiency losses due to higher water temps at condenser inlet.) Mirant/Alden also indicates that these annual losses in saleable output translate into an 11 MW "penalty" on overall plant capacity rating. EPA does not consider this relatively small energy effect a significant enough adverse effect to provide a basis for rejecting closed-cycle cooling as the BTA in this case given the technology's ability to greatly reduce adverse environmental impacts from the facility's CWISs.

Canal Station is not subject to a Reliability Must Run (RMR) agreement with ISO New England, which would require it to run in order to preserve the stability of the bulk power grid for the region. As a result, it operates as a competitive electric supplier to the New England region and produces electricity when it is economically beneficial to Mirant. *See Cape Cod Online* article entitled, "State acts to cut canal power plant operation" (April 3, 2008) (discussing, among other things, Canal Station's role as possible backup source of electricity). In addition, EPA's analysis shows that both units at the plant produced significantly less electricity in 2006 (capacity factors of approximately 20% and 15% for Units 1 and 2, respectively) than in 2005 (capacity factors of approximately 60% and 41% for Units 1 and 2, respectively). This indicates that in 2006 electricity was frequently supplied to the Cape Cod region by other, more competitive, electric generating facilities. It appears that production in 2007 was similar to 2006 levels. This further suggests that regional and local electricity demand likely can be met through existing generation sources even if Canal Station's generating capacity is slightly reduced or it was temporarily unavailable to the grid. There are, of course, peak demand days when all or nearly all generating units in the region are being called upon, and there can be days when natural gas supplies are constrained and demand for oil-fired generation will increase, but the region should well be able to handle any slight reduction in Canal Station output that may result from the facility switching to closed-cycle cooling. The region should be able to access both new capacity and generating sources from outside the region that can deliver power through the grid. It should also be noted that some are predicting that electricity from Canal Station will be needed even less frequently in the future due to the installation of new transmission lines capable of bringing more electricity into the Cape Cod area. *See Cape Cod Online* article entitled, "State acts to cut canal power plant operation" (April 3, 2008) (suggesting that recently approved new transmission lines could, once they are in place, lead to the elimination of off-peak operations by Canal Station, which would further reduce the facility's overall capacity factor).

It should also be noted that Mirant/Alden predicts that a 6-month generating unit outage will be needed during the implementation of intake and circulating water pipe modifications. Assuming that six months is a reasonable estimate of shutdown needs, EPA notes that the schedule for modifications could potentially be structured so that at least one of the facility's generating units could remain available for operation at all times. In addition, it might be possible to plan an implementation schedule so that any shutdown periods would occur outside of peak demand/generation periods. Whether or not sequencing activities in this manner would make sense will depend on the extent of any concern about outages.

Noise

Noise could be a concern if retrofitted mechanical draft cooling towers are located near sensitive receptors (*e.g.*, residences). Sound emissions from mechanical draft cooling towers are principally associated with fans used to assist the flow of air through the cooling tower structure, fan drive systems, and water falling within the towers.

Canal Station is located in an industrial setting within 1100 feet of certain public recreation and residential areas. Operation of mechanical draft cooling towers would likely affect sound levels in the area around Canal Station. Mirant/Alden's evaluation suggested that sound levels in the area could increase to "as high as 50 dBA within 300 feet of the tower" due to the number and size of fans required for the cooling towers. *See* Alden Report at 4-12, App. B at B-4. According to Alden, sound abatement measures are available but could increase the cost of the cooling towers by up to 25 percent. *Id.* at B-4.

EPA considers sound emissions from cooling system technology as a "non-water quality" environmental effect in the context of making its BTA determination under CWA § 316(b), but does not directly impose any federal regulatory requirements on such sound emissions. Emissions of sound from mechanical draft cooling towers at Canal Station will be subject to review and regulation by MassDEP during future air permitting for the cooling towers under state law. MassDEP has regulations and policies directly pertaining to noise emissions that will be applied in the state permitting process. *See* EPA Region 1, Determination on Remand for Brayton Point Station Permit (November 30, 2006), at 46-54 (discussion of Massachusetts noise control requirements).

In the context of making its BTA determination, EPA must reasonably assess whether cooling tower sound emissions are likely to comply with applicable state requirements – this is part of determining whether the technology is "available" – or might otherwise be unacceptable as a matter of EPA's policy discretion. *See id.* at 36-37. As discussed below, adequate information has been developed for EPA to reasonably assess these issues for its BTA determination under CWA § 316(b). Although the information developed to date would not likely be sufficient for the full assessment of cooling tower sound emissions and mitigation measures applicable to Canal Station that the state will require for its air permitting review, this full-scale analysis is not a prerequisite for this NPDES permit determination. *See id.* at 37. Mirant will, however, have to submit additional, detailed information to the MassDEP pertaining to cooling tower sound emissions and mitigation measures in order to receive the necessary state air approvals to construct and operate the cooling towers.

MassDEP's air quality permit review for a proposed cooling tower installation at Canal Station will include application of MassDEP's noise control regulations and policies. Because Canal Station is a longstanding, existing facility, a key part of MassDEP's assessment will be to compare existing sound levels, including sound emissions from the existing power plant, with the sound levels that would result from adding cooling tower operations to the facility. MassDEP's review will examine, among other things, the following factors: the source of the additional sound; existing sound levels and their effects on the local environment; ways to minimize the new sound emissions; whether or not sound levels can be addressed beyond the

property boundary of the source, if the impacts exceed applicable guidelines; and whether facility sound emissions from sources other than the new cooling towers could be reduced. *See* EPA Region 1, Determination on Remand for Brayton Point Station Permit (November 30, 2006), at 53-54 (discussing MassDEP's approach to assessing the addition of sound emissions to longstanding, existing facilities). Until MassDEP's review is complete, it is unclear what, if any, sound emission mitigation will be needed for a cooling tower installation at Canal Station.

EPA reasonably investigated the potential sound level increases that would result from converting Canal Station to a closed-cycle, mechanical draft cooling tower system. Given the limited sound emission data for such cooling towers at Canal Station, EPA utilized the available Canal Station data in conjunction with information from its noise analysis conducted for the installation of mechanical draft cooling towers at Brayton Point Station (BPS) to conduct the analysis set forth below.[36] EPA has concluded that the BPS estimates can generally be used, with appropriate site-specific adjustments, to help in assessing likely future sound emissions from retrofitting mechanical draft cooling towers to Canal Station and other large, existing coastal New England facilities.[37] Table 1 summarizes the results of EPA's analysis.

Table 1. Estimated sound levels that would result from installing and operating closed-cycle, mechanical draft cooling towers at Canal Station (based on adjustment of Brayton Point Station levels to reflect conditions at Canal Station).

Location	Receptor Distance (ft)	Delta Distance (ft)	Existing L_{90} (dBA)	Cooling Tower Sound Level (dBA)	New L_{90} Level (dBA)	Increase in L_{90} (dBA)
Tupper Rd (Canal) v. Jackson (BPS)	2358[1]	-414 (18%)	42[2]	41.76[3]	44.9[4]	2.9
	2772		42	40.3	44.24	2.2
Tupper Rd. (Canal) v. Bayside Ave. (BPS)	2358[1]	+404 (17%)	42[2]	41.76[3]	44.9[4]	2.9
	1954		45	43.3	47.29	2.3
Parking Lot (Canal) v. Home (BPS)	2944[1]	+146 (5%)	49[2]	39.7[3]	49.5[4]	0.5
	2798		38	40.2	42.26	4.3
Parking Lot (Canal) v. Jackson (BPS)	2944[1]	+172 (6%)	49[2]	39.7[3]	49.5[4]	0.5
	2772		42	40.3	44.24	2.2
Dexter Ave. (Canal) v. Bayside Ave. (BPS)	2070[1]	+116 (6%)	43[2]	42.8[3]	45.9[4]	2.9
	1954		45	43.3	47.26	2.3
Marina (Canal)	958[1]	n/a	53[2]	48.1[3]	54.2[4]	1.2
Freezer Rd. (Canal)	792[1]	n/a	50[2]	49.07[3]	52.6[4]	2.6
Briarwood Rd. (Canal)	598[1]	n/a	50[2]	50.2[3]	53.1[4]	3.1

[1] Canal receptor distances taken from Appendix 4.3 in Canal Redevelopment Project Final Environmental Impact Report (EIR), January 2000. The location of HRSG/Stack A in the 2000 EIR is

[36] The BPS analysis was conducted for EPA by its contractor, Hatch. Hatch. 2006. Attachment A: Noise Impact Assessment for Brayton Point NPDES Permitting Effort, Appendix C: Sound Level Predictions.

[37] Natural draft cooling towers would be expected to be significantly quieter than mechanical draft towers because major fan equipment is not used.

the same as the proposed location for mechanical draft cooling towers in this analysis.

[2] Sound level data taken from Tables 3-4 to 3-6 in Canal Redevelopment Project Final EIR, January 2000.

[3] The sound levels at the receptor distances for Canal were extrapolated from the BPS sound level analysis that was based on full station closed-cycle at BPS by Manufacturer 2 using fan deck barrier wall and 18-foot grade level barrier wall. Since Canal will require fewer cooling tower cells than full station BPS, the extrapolation is likely to overestimate the sound levels that will be emitted from a Canal conversion using mechanical draft cooling towers with the same level of mitigation.

[4] New L90 Level calculated using an on-line sound addition calculator (http://www.insulation.com.au/calculators/noiselevel.htm). Results from on-line calculator verified using the following equation for noise addition:

L_{90} total = 10 x $Log_{10}(10^{(L90coolingtower/10)} + 10^{(L90ambient/10)})$

(see FHWA Traffic Noise Doc.)

[5] All data for BPS taken from Addendum to Noise Impact Assessment, Hatch, November 2006 (see Appendix C to Attachment A).

As indicated in Table 1, increases in sound levels resulting from cooling towers at Canal Station are estimated to range from 0.5 dBA at the farthest receptor (2,944 feet) to 3.1 dBA at the closest receptor (598 feet). Based on the review of current information, EPA, in consultation with MassDEP, has concluded that the projected increase of approximately 3 dBA above the existing background sound level with the current facility in operation would result in a barely perceptible increase at residences and would satisfy MassDEP's sound impact criteria (Email from John Winkler, MassDEP on December 4, 2007). In addition, Hatch's analysis of octave band data at Brayton Point Station indicated that a pure tone condition as defined by MassDEP would not be created by operating mechanical draft cooling towers. Similarly, no adverse impact in this regard would be expected at Canal Station. Thus, EPA concludes that the operation of mechanical draft cooling towers at Canal Station would likely comply with applicable Massachusetts noise control requirements and the sound emissions would not otherwise cause unacceptable impacts.

Furthermore, a range of suitable measures exists among the state-of-the-art technologies to minimize sound emissions, such as the low noise fans and sound barriers proposed as mitigation for the BPS installation. While sound emission control measures beyond a simple low noise cooling tower could be needed to mitigate sound emission impacts at Canal Station adequately, it is impossible at this time to be sure what additional measures, if any, would be called for. MassDEP will require Canal Station to further evaluate sound level mitigation, while considering costs, to see if reducing impacts [to even less than 3 dBA] at the closest receptors would be possible (Email from John Winkler, MassDEP on December 4, 2007).

In light of the Agency's analysis for Brayton Point Station, EPA believes that the Alden Report's suggestion that such mitigation *might* add 25 percent to the capital cost of the cooling tower equipment *may* be a fair, albeit rough, estimate for this stage of the analysis. *See, e.g.*, BPS Responses to Comments at IV-84 to IV-85. EPA also concludes, however, that it is reasonable to continue using the Mirant/Alden capital cost estimate of $108 million for purposes of the present analysis for several reasons. First, it is impossible at this juncture to predict what, if any, additional sound emission mitigation will be needed as a result of the MassDEP's review and approval process. The Permittee will need to apply for approvals from the MassDEP and include

a sound levels analysis of its own. This state review process will ultimately determine the level of mitigation, if any, that is required. Since EPA's analysis for the purpose of NPDES permit development cannot be the basis of, or take the place of, the MassDEP's regulatory decision-making regarding cooling tower sound emissions, EPA cannot definitively determine whether it would be reasonable to add any particular amount to the existing cost estimates for cooling towers in order to reflect mitigation expenses. Second, it is unclear what degree of sound emission abatement features may already be reflected in the Mirant/Alden cooling tower cost estimate, which was based on the EPRI cost factors for "difficult sites" in part because of noise concerns. *See* Alden Report at 5-2. Finally, the Agency also does not think that this is a significant issue because even if the capital costs for cooling towers increase somewhat due to sound emission mitigation, the costs would likely remain within the margin of error already built into the generalized cost estimate produced by Alden based on the EPRI figures. *See* Alden Report at 5-1 and 5-2.

Air Emissions

As a result of generating efficiency losses associated with switching to closed-cycle cooling using cooling towers, the subject power plant, or another facility, may burn more fuel in order to make up for the reduction in generation. The burning of additional fuel may, in turn, produce increased air emissions.

The effect of these increases, however, is small for recirculating cooling systems in most locations, but will be influenced by site-specific factors such as the existing ambient air quality and the type of equipment used to burn the additional fuel (EPRI 2002). Although the information necessary to conduct a detailed analysis of the increases in air emissions that would be predicted to result from using cooling towers at Canal Station is unavailable, EPA did consider potential air emissions increases in its BTA analysis. The total energy deficit at Canal Station resulting from the need for auxiliary power and lost efficiency due to higher water temperatures in the condenser inlet is in the range of 2.2 percent (Alden 2003). Although Canal Station or another generating station may need to burn additional fuel to compensate for this energy loss, the resulting air emissions would likely be a small fraction of the total emissions from either Canal Station or another plant. Moreover, as discussed above, Canal Station's capacity factor dropped to around 20 percent in 2006. Thus, the addition of cooling towers is likely to lead to only very marginal changes in air emissions.

The EPA has developed National Ambient Air Quality Standards for the protection of public health and welfare, which are enforced by MassDEP as state air quality standards along with additional emissions standards for power plants. See 310 C.M.R. 7.29: Emissions Standards for Power Plants. Indeed, the Massachusetts regulations have required significant emission reductions by power plants such as Canal Station. Thus, compliance with Massachusetts air regulations will ensure the emissions of particulates; sulfur dioxide, nitrogen oxides, carbon dioxide, and mercury associated with the burning of fossil fuels at Canal Station are protective of public health. EPA believes that air emissions due to the implementation of wet cooling towers would not have a substantial environmental impact, but reiterates that any new cooling towers will be subject to air permitting requirements and will need to satisfy all applicable air pollution standards (*e.g.*, standards for particulate emissions).

7. EPA Has Decided to Exercise Its Discretion Not to Reopen the Public Comment Period for the Final Permit

EPA may alter conditions in a final permit from the corresponding conditions proposed in the draft permit without necessarily triggering the need for a new round of notice and comment. *See, e.g., In re District of Columbia Water and Sewer Authority,* NPDES Appeal Nos. 05-02, 07-10, 07-11, 07-12, slip op. at 61 (EAB, March 19, 2008) (citations omitted). Nevertheless, EPA's Environmental Appeals Board (EAB or the Board) has also made clear that "a final permit that differs from a proposed permit and is not subject to public notice and comment must be a 'logical outgrowth' of the proposed permit." *Id.* (citations omitted). The "'essential inquiry'" for determining whether a final permit is a logical outgrowth of the draft permit "'focuses on whether interested parties reasonably could have anticipated the final rulemaking from the draft permit." *Id.* at 61 (citing, *NRDC v. EPA*, 279 F.3d 1180, 1186 (9th Cir. 2002)). The mere fact that the Final Permit conditions differ from those in the Draft Permit does not mean that the final conditions could not reasonably have been anticipated. To answer this question, it is salient to determine "'whether a new round of notice and comment would provide the first opportunity for interested parties to offer comments that could persuade the agency to modify its rule.'" *Id*. at 61-62 (citing, *NRDC*, 279 F.3d at 1186).

In addition to the logical outgrowth test, EPA regulations at 40 C.F.R. § 124.14(b) specify that "if any data[,] information[,] or arguments submitted during the public comment period . . . appear to raise substantial new questions concerning a permit, the Regional Administrator may . . . reopen or extend the comment period." In the case of *In re Dominion Energy Brayton Point, L.L.C. (Formerly USGen New England, Inc.) Brayton Point Station*, 12 E.A.D. 490 (EAB 2006), the EAB summarized the legal framework surrounding 40 C.F.R. § 124.14(b) as follows:

> [t]he critical elements of this regulatory provision are that new questions must be 'substantial' and that the Regional Administrator 'may' take action.' *In re NE Hub Partners, L.P.*, 7 E.A.D. 561, 585 (EAB 1998), *rev. denied sub nom. Penn Fuel Gas, Inc. v. EPA*, 185 F.3d 862 (3d Cir. 1999); *accord In re Ash Grove Cement Co.*, 7 E.A.D. 387, 431 (EAB 1997). Thus, based on the language of this regulation, the Board has long acknowledged that the decision to reopen the public comment period is largely discretionary." *NE Hub*, 7 E.A.D. at 585; *Amoco Oil.*, 4 E.A.D. at 980; *see also Old Dominion*, 3 E.A.D. at 797. Furthermore, where the Agency adds new information to the record in response to comments, "the appellate review process affords [petitioner] the opportunity to question the validity of the material in the administrative record upon which the Agency relies in issuing a permit." *Caribe*, 8 E.A.D. at 705 n.19 (EAB 2000); *accord NE Hub*, 7 E.A.D. at 587 n. 14; *Ash Grove*, 7 E.A.D. at 431.

Dominion at 695. A Region's decision not to reopen the comment period under 40 C.F.R. § 124.14(b) in the face of substantial new questions is subject to EAB review under an "abuse of discretion" standard and the Board has noted that a Region has "substantial discretion" in this regard. *In re Chelalis Generating Station*, PSD Appeal No. 01-06, slip op. at 32-33 (EAB, Aug. 20, 2001) (Order Denying Review). *See also In re Metcalf Energy Center*, PSD Appeal Nos. 01-

07 & 01-08, slip op. at 27-30 (EAB, Aug. 10, 2001) (Order Denying Review). In addition, the EAB has stated that its review under § 124.14(b) will be "deferential." *NE Hub*, 7 E.A.D. at 585.

Thus, in responding to comments, a Region may generate new information and analysis, add new materials to the administrative record, and change permit conditions without necessarily triggering a need to reopen the public comment period under 40 C.F.R. § 124.14(b). *See also* 40 C.F.R. §§ 124.17(b) (in responding to comments, new materials may be added to administrative record for final permit) and 124.18(b)(4).[38] To warrant reopening the comment period, the questions raised by the new information must be both new (*i.e.*, not involve issues already evident in the permit proceeding) and substantial (*i.e.*, have a material effect on the permit result). Moreover, even if a question is new and substantial, the Region may still exercise reasonable discretion in deciding whether to reopen the comment period. Many considerations may inform the Region's exercise of this discretion, including whether permit conditions have been significantly changed as a result of the substantial new questions, whether the new information or new permit conditions were developed in response to comments received during the permit proceeding, whether the record adequately explains the Agency's reasoning so that a dissatisfied party can fairly develop a permit appeal, and the significance of adding delay to the particular permit proceeding. *See, e.g., Chelalis*, slip op. at 33, 35-36; *Metcalf Energy*, slip op. at 29*; NE Hub*, 7 E.A.D. at 587, n. 14; *In the Matter of Old Dominion Elec. Co.*, 3 E.A.D. 779, 797-98 (Adm'r 1992); *In the Matter of Thermalkem, Inc., Rock Hill, South Carolina*, 3 E.A.D. 355, 357-58 (Adm'r 1990).

The logical outgrowth test and 40 C.F.R. § 124.14(b) impose separate but related standards. The former addresses changed permit conditions, whereas the latter addresses any situation in which substantial new questions are raised by new information, whether it involves changed permit conditions or the addition of new analysis to the record. In *District of Columbia*, slip op. at 62, the EAB explained that the "logical outgrowth" test is reflected in EPA regulations and prior EAB decisions. The Board also made clear that although it will often defer to the permit issuer's decision about whether or not to reopen the comment period, it will "consider changes to draft permits on a case-by-case basis and, depending on the significance of the change, may determine that reopening the comment period is warranted." *Id.* at 62 (citations omitted). The EAB further stated that determining both whether changed provisions in the final permit satisfy the "logical outgrowth" standard, and whether new information added to the record raises "substantial new questions" requiring reopening of the comment period, involve "fact-based inquiries . . . [concerning] the evolution of the permit condition at issue, and the Region's corresponding explanatory statements." *Id.* at 63.

With regard to the Canal Station Permit, EPA's consideration of public comments and legal developments since issuance of the Draft Permit – namely, the *Riverkeeper II* decision and

[38] The EAB and the courts have construed applicable law not to require additional rounds of public comment in every case in which new information is added to the record or a permit condition is changed in response to comments. This avoids creating a disincentive for agencies to respond to comments by improving analyses or appropriately changing permit conditions. *See, e.g., Old Dominion*, 3 E.A.D. at 797. Otherwise, agencies would face a Hobson's choice between inferior quality decisions and a never ending public comment process. *See, e.g. Rybachek v. EPA***,** 904 F.2d 1276, 1287 (9th Cir. 1990); *BASF Wyandotte Corp., et al., v. Costle***,** 598 F.2d 637, 644 - 47 (1st Cir. 1979).

EPA's suspension of the Phase II Rule – have led EPA to revise the Draft Permit's CWIS-related limits under CWA § 316(b) for the Final Permit. The new permit limits are, however, based on an alternative (retrofitting closed-cycle cooling) that was evaluated for the Draft Permit and that was determined to be adequate to satisfy the BTA standard of CWA § 316(b). In response to comments on the Draft Permit that addressed this alternative, EPA has also added certain new information to the record (*e.g.*, a more detailed assessment of the cooling tower sound emissions that would be anticipated at Canal Station). After considering the changed permit conditions and new information, EPA has determined that it is not necessary to reopen the public comment period in this case (1) because the changed Final Permit conditions are a logical outgrowth of the Draft Permit's conditions and supporting analysis, and (2) because the new information added to the record does not raise substantial new questions that warrant reopening the comment period. EPA's determination is explained below.

In the Fact Sheet for the Draft Permit, EPA explained that the Permit's CWIS limits were based on a case-by-case, best professional judgment (BPJ) application of CWA § 316(b). *See* Fact Sheet at 24-27. This BPJ approach was consistent with the terms of both the statute, *see* 33 U.S.C. §1342(a), and the Phase II Rule. *See* 40 C.F.R. § 125.95(a)(2)(ii). In the Fact Sheet, EPA described the legal underpinnings of its BPJ determination and the factors it considered in the analysis, which included the substantive standards of § 316(b) and the terms of the Phase II Rule. *See* Fact Sheet at 24-27, 44-46. EPA also explained, however, that the Phase II Rule was being challenged in federal court, *id.* at 25, and stated that, ". . . if it later turns out that for some reason the Phase II Regulations are not in effect at the time this Final Permit becomes effective (*e.g.*, they have been stayed or remanded as a result of the litigation that has been filed regarding the new regulations), then the Final Permit would still have a proper BPJ-based foundation for its § 316(b) requirements." *Id.* at 27. Thus, EPA made clear that the Phase II Rule might or might not be in effect at the time the Final Permit was issued but that, in either case, the Permit's CWIS limits would be based on a BPJ application of CWA § 316(b).

From the outset of this permit proceeding, closed-cycle cooling has received careful consideration as a potential choice for the BTA at Canal Station. It was one of the options evaluated in detail by Mirant in the Alden Report, submitted to EPA before issuance of the Draft Permit. It was also one of the options evaluated in detail by EPA in the Fact Sheet issued with the Draft Permit. *See* Fact Sheet at 44-46. EPA stated in the Fact Sheet that this option would achieve the greatest reductions in entrainment and impingement at Canal Station of all the options and *would* satisfy CWA § 316(b)'s BTA requirement at the facility. *Id.* Thus, closed-cycle cooling was clearly identified as a technology that would satisfy BTA requirements for Canal Station.

The Fact Sheet also stated, however, that EPA was "not presently prepared to mandate closed-cycle technology in this permit" because there was a "need to further evaluate . . . [the] cost [of closed-cycle cooling] as well as the performance capabilities of other significantly less expensive alternatives." *Id.* at 46.[39] EPA explained that "the new Phase II Regulations require the

[39] It should be understood that this was largely an issue with regard to entrainment reduction requirements. EPA was able to identify straightforward, relatively inexpensive steps for impingement reduction and included corresponding provisions in the Draft Permit. *See* Fact Sheet at 46-47.

development of the information necessary to compare compliance alternatives and identify BTA requirements." *Id.* Thus, EPA was concerned about definitively selecting closed-cycle cooling as the only possible BTA for reducing entrainment when the substantive requirements of the Phase II Rule, once they could be fully applied to Canal Station, might have offered Mirant a much less expensive alternative to closed-cycle cooling. This problem arose out of the terms of the Rule coupled with the remaining uncertainty regarding the entrainment reduction capability of the various screening systems, all of which were predicted to cost significantly less than closed-cycle cooling. *See* Fact Sheet at 41-43, 46. Under the Rule, Canal Station might have been able to qualify for less stringent, site-specific performance standards which, in turn, could have provided a basis for approving less environmentally protective, and far less expensive, technologies (or restoration measures) as the appropriate BTA.[40]

Therefore, rather than impose permit limits based on closed-cycle cooling, EPA included information submission requirements in the Draft Permit that precisely mirrored the Rule's information submission requirements and timetable. These submissions were intended then to support a future determination of appropriate performance standards and permit requirements under § 316(b). Thus, EPA's BPJ decision not to determine closed-cycle cooling to be the only technology capable of satisfying BTA requirements for entrainment reduction for the Draft Permit and, instead, to specify particular information submission requirements to support further analysis of potential alternatives was based directly on the terms of the Phase II Rule.

For this Final Permit, EPA has revisited its BPJ analysis in light of the Agency's suspension of the Phase II Rule, the holdings of the *Riverkeeper II* decision, and the public comments on the Draft Permit. This re-evaluation has led EPA to conclude for the Final Permit that closed-cycle cooling is the BTA for Canal Station, primarily because the Agency's earlier reasons for declining to designate closed-cycle cooling as the exclusive BTA no longer apply. In this Response to Comments document, EPA thoroughly explains the rationale for its Final Permit decision and how it evolved from the Draft Permit decision.

Although EPA has now definitively determined that closed-cycle cooling is the BTA for Canal Station, it should also be understood that the Final Permit does not *per se* require the installation of closed-cycle cooling. EPA has, instead, drafted the Final Permit to impose a *performance standard* that requires performance comparable to what could be achieved by an optimized closed-cycle cooling system at Canal Station, but without specifically mandating the use of that technology. The Permittee may use *any* technology capable of meeting the performance standard. The Fact Sheet for the Draft Permit discussed technological alternatives to closed-cycle cooling and the uncertainties regarding their performance that precluded their being

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[40] As EPA explained in a permit proceeding involving another Mirant facility, in some cases, the unusual circumstance of applying a statutory provision on a BPJ basis against the backdrop of an effective regulation implementing that statutory provision may raise equitable considerations that will influence the Agency's BPJ. *See Mirant Kendall Station NPDES Permit # MA0004898, Responses to Comments (September 2006),* at Resp. H1, pp. H12 – H13; Resp. H8, pp. H28 – H29 (discussing application of CWA § 316(b) on a BPJ basis under 40 C.F.R. § 125.95(a)(2)(ii) of the Phase II Rule for a Final Permit, and citing *NRDC v. EPA*, 863 F.2d 1420, 1428 (9th Cir. 1988)).

designated as the BTA at that time. As discussed above, the record currently demonstrates that these uncertainties remain. Nevertheless, the Final Permit's conditions do not preclude using these (or any other) technologies if it is later determined that they are able to meet the Permit's performance standards.

Furthermore, EPA has expressly stated that it understands that when the Final Permit is issued, Canal Station will not already have the technology in place to comply with the Permit's limits, though the Permit will require immediate compliance. Therefore, EPA expects to issue the Permittee an administrative compliance order that will provide an enforceable timetable under which the Permittee can consider alternative ways of coming into compliance with the Final Permit's performance standards and ultimately select and install an appropriate compliance option. If as a result of this analysis Mirant thinks that closed-cycle cooling is not the correct BTA, and that the Final Permit should not contain performance standards based on that technology, then the Final Permit specifies that Mirant can apply for a permit modification.

EPA has determined that the comment period does not need to be reopened with regard to the CWIS requirements included in the Final Permit under CWA § 316(b) because these conditions are a logical outgrowth of the Draft Permit's provisions. Applying the test specified in *District of Columbia*, slip op. at 61-62 (citing, *NRDC*, 279 F.3d at 1186), it is clear that a new round of public comment on the Final Permit would not "provide the first opportunity for interested parties to offer comments that could persuade the agency to modify its rule." As a result, the Final Permit's conditions could reasonably have been anticipated from the provisions of the Draft Permit and the analysis supporting them.

From the beginning of this permit proceeding, closed-cycle cooling has been under review as a possible BTA for Canal Station. Mirant assessed this option in the Alden Report and EPA evaluated it in the Fact Sheet. Moreover, in light of EPA's assessment of closed-cycle cooling in the Fact Sheet for the Draft Permit – *i.e.*, that it was the best performing technology and one that would satisfy CWA § 316(b)'s BTA standard – it could reasonably have been anticipated that the Final Permit might end up including intake limits based on closed-cycle cooling. All interested persons had the opportunity to comment on the closed-cycle cooling option and whether or not it would satisfy the BTA requirement. Indeed, both Mirant and MA-DMF commented specifically on closed-cycle cooling, taking opposite positions on whether it should be designated as the BTA. Mirant's comments on closed-cycle cooling were presented both in terms of the Phase II Rule's requirements and with regard to issues related to the technology apart from the Rule.

With the suspension of the Phase II Rule, the issues identified by EPA as reasons for declining to specify closed-cycle cooling as the BTA at Canal Station have been clarified and resolved, and the reasons for including the Draft Permit's particular information submission requirements no longer apply. The possibility that this state of affairs would come to pass was specifically anticipated by EPA's Fact Sheet, which pointed out that the Phase II Rule was being challenged in federal court but that whether or not the Rule remained in effect, the Final Permit would be based on a BPJ application of § 316(b). Therefore, although the Final Permit's conditions based on closed-cycle cooling as the BTA are different from those included in the Draft Permit, the new BPJ-based permit conditions are a logical outgrowth of the BPJ-based analysis undertaken

for the Draft Permit. Furthermore, EPA's legal assessment of the import of the suspension of the Phase II Rule and the *Riverkeeper II* decision is adequately explained herein to enable any aggrieved party to fairly develop an appeal to the EAB if it feels the Agency has erred.

In addition, EPA's Fact Sheet for the Draft Permit identified uncertainties about the performance capabilities of the various screening technologies. All interested persons had the opportunity to comment on these and any other technological options, but the uncertainties remain and no other technology was identified that was as effective as closed-cycle cooling. Nevertheless, EPA's Final Permit sets performance standards based on closed-cycle cooling but allows the use of any other technology that can achieve comparable performance. These permit conditions reasonably address the current technological information and are also a logical outgrowth of the Draft Permit.

While new legal developments and public comments have led to changed permit conditions, and have prompted some additional factual analysis by EPA (*e.g.*, further analysis of sound emissions from closed-cycle cooling), the questions raised for the Final Permit are not "new," as contemplated by EPA's regulations. EPA's determination for the Final Permit that closed-cycle cooling should be designated as the BTA for Canal Station does not raise "new" questions because, as described above, closed-cycle cooling was evaluated in detail in the Fact Sheet and all parties had the opportunity to comment on it and the issues related to it. Similarly, the new information related to closed-cycle cooling that is included in the record for the Final Permit does not raise new questions and any party to the proceeding may appeal to the EAB regarding this new information. In addition, new questions are not raised by EPA's decision to write the Final Permit conditions to be flexible enough to allow compliance using any technology other than closed-cycle cooling that can meet the Permit's performance standards. The Draft Permit's Fact Sheet discussed technological alternatives to closed-cycle cooling, including the uncertainties regarding their performance that precluded their being designated as the BTA at that time. As discussed above, the uncertainties about these technologies remain but the Final Permit does not preclude their use if it is later determined that they can meet the Permit's performance standards. The Final Permit's provisions are, thus, based on technical issues that are discussed in both the Fact Sheet for the Draft Permit and these Responses to Comments, and they do not involve new questions.

The suspension of the Phase II Rule and the Second Circuit's decision in *Riverkeeper* are obviously significant new legal developments that have contributed to significant changes in the permit's CWIS requirements. Yet, these developments do not raise substantial *new* questions that warrant reopening the comment period. Instead, they have largely clarified how EPA should resolve *existing* questions posed in the Fact Sheet and reflected in Draft Permit. Moreover, in selecting closed-cycle cooling as the BTA, EPA has substantially relied on record information that not only pre-dated issuance of the Draft Permit, but was provided to EPA by Mirant itself (*e.g.*, the Alden Report). As explained above and in the Fact Sheet, both the Draft Permit and this Final Permit were developed based on a BPJ application of CWA § 316(b). For the Draft Permit, EPA applied its BPJ in light of (or as informed by) the terms of the Phase II Rule but also noted that the Rule was being challenged in federal court and might or might not be in effect at the time of the Final Permit. At the present time, CWA § 316(b) is still to be applied on a BPJ basis, but given that the Phase II Rule has been suspended, it would no longer be appropriate to

have the terms of the Rule inform the Agency's application of BPJ. Moreover, not only have the Rule's provisions regarding site-specific performance standards, restoration measures, and information submissions been suspended, but the *Riverkeeper II* decision indicates that the BTA standard may not be satisfied based on cost/benefit comparisons or on restoration programs. (As stated above, the Supreme Court will be reviewing the cost/benefit issue in the future.) As a result, EPA's BTA determination for the Canal Station Permit has now focused on the specific technological options evaluated for the Draft Permit without regard for the provisions of the suspended Phase II Rule. EPA's analysis for the Draft Permit clearly indicated that apart from these considerations, closed-cycle cooling was a likely candidate to constitute the BTA at Canal Station. Therefore, EPA's BTA determination for the Final Permit does not raise substantial new questions.

Finally, even if substantial new questions were raised by the Final Permit, EPA concludes that the questions at issue do not warrant the discretionary reopening of the public comment period. This Response to Comments document explains EPA's thinking on the relevant issues in detail and will fully enable Mirant or any other party to prepare an appeal of the Final Permit if they wish. Furthermore, reissuance of a Final Permit to Canal Station is long overdue. The existing permit expired in 1994, while the Draft Permit was issued in December 2005. As currently operated, the plant can take in up to 518 million gallons per day of water from the Cape Cod Canal, entraining billions of eggs and millions of larvae as well as impinging tens of thousands of organisms present in that water. Furthermore, these entrainment and impingement losses are occurring against a backdrop of declining fish populations, which makes the losses, and their timely redress, an even greater concern. Finally, the new Final Permit addresses a number of important issues besides CWIS impacts and these provisions would also be delayed if the comment period was reopened (e.g., final discharge temperature limits, appropriate limits for metal cleaning waste streams, impingement mortality reduction requirements).

Section IX.B Mirant's Additional Phase II Rule-Related Comments

Comment IX.B.1.1:

Mirant argues that EPA's proposed requirements for the Canal Station are inconsistent with the Phase II Rule. Mirant's comments are quoted below:

> Mirant Canal has not had an opportunity to evaluate compliance options under the Phase II Rule. Instead, EPA proposes to establish new "BPJ" requirements. This is the case even though EPA, exercising its best professional judgment, has issued several previous permits finding that the existing cooling water intake structure reflects the "best technology available." Indeed, Part A.1.g of the current permit, issued in 1989, provides:
>
> > It has been determined that the circulating water intake structure employs the best technology available for minimizing adverse environmental impact. . . . The present design will be reviewed for conformity to regulations pursuant to Section 316(b) when such are promulgated.

> Before that, in 1983 EPA evaluated intake structure effects and, after reviewing a 1978 report on intake effects entitled "Final Report on Fish Entrapment, Canal Units 1 & 2 Intake Screens" (Hall and Morrow 1978), and subsequent letters confirming that impingement values had remained within the expected range, agreed that "fish entrapment at the station was minimal." 1983 Draft Permit Fact Sheet, Part. IV.c, p. 4. In 1988, the Agency undertook a follow-up review, evaluating more recent information on impingement effects. The Fact Sheet concluded that "the installation of chutes to transport impinged fish back into Cape Cod Canal water greatly improved the survival of impinged fish. Studies during the past few years show that the numbers of fish observed on the intake screens has remained within the range expected based on the previous studies. Finfish entrapment still appears to be minimal at the station." Fact Sheet, 1988 Draft NPDES Permit MA0004928, Part IV.c, p.4.

Response IX.B.1.1:

Mirant's concern about being unable to pursue the compliance options set forth in the Phase II Rule is unfounded because, among other reasons, the Phase II Rule is no longer in effect. (Moreover, even prior to the suspension of the Phase II Rule, the Canal Station Permit's limits under CWA § 316(b) were properly being based on BPJ under the terms of the Rule. *See* 40 C.F.R. § 125.95(a)(2)(ii).)

Mirant also, in effect, expresses concern that the present BTA determination under CWA § 316(b) differs from the BTA determinations made for prior permits, including the most recent such determination which was made some 19 years ago, in 1989. Yet, the fact that EPA may impose more stringent limits in a newly reissued permit by itself presents no infirmity and, in fact, is commonplace:

> [b]ecause of technological and other changes, abatement measures that may have met EPA's requirements at the time the existing permit was issued may no longer suffice when the permit is reevaluated for renewal. Congress made it clear when it enacted the Clean Water Act that its goal was not merely to reduce pollution in navigable waters but to eliminate it. 33 U.S.C. 1251(a)(1) and (2). The statue expressly provides for effluent limitations that will "result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants … [where] such elimination is technologically and economically achievable …." 33 U.S.C. 1311(b)(2)(A).

In the Matter of: Rubicon Inc., 2 E.A.D. 551, 554 (CJO 1988). Earlier permit conditions or technical analyses are not "grandfathered" into later permits. If that were the case, there would be no need for maximum five-year terms for NPDES permits or detailed permit renewal application requirements. The CWA demands that the permit issuer reevaluate the record at the permit reissuance stage and determine whether new permit conditions are warranted based on the best, reasonably available information and the current understanding of the relevant law and science. Of course, analyses undertaken in support of past permits, and permit conditions included in past permits, may continue to be relied upon and used for current permits *if* a contemporary consideration of the issues indicates that these past analyses and permit conditions remain valid.

To satisfy CWA § 316(b), the location, design, construction, and capacity of the facility's cooling water intake structure(s) (CWIS) must reflect the BTA for minimizing adverse environmental impacts. 33 U.S.C. § 1326(b). *See also* 40 C.F.R. §§ 401.14 and 122.44(b)(3); 40 C.F.R. Part 125, Subpart I and 40 C.F.R. § 125.90(b). "Section 316(b) expressly requires a technology-driven result." *Riverkeeper II*, 475 F.3d at 99-100 (citing *Natural Res. Def. Council, Inc. v. EPA*, 822 F.2d 104, 123 (D.C. Cir. 1987) ("[T]he most salient characteristic of [the CWA's] statutory scheme, articulated time and again by its architects and embedded in the statutory language, is that it is technology-forcing."). *See also Riverkeeper I*, 358 F.3d at 184-86; *In re: General Motors, Inc.*, 10 E.A.D. 360, 378 (EAB 2002) (citing *In re Metcalf Energy Ctr.*, PSD Appeal Nos. 01-07 & 01-08, at 15 (Aug. 10, 2001) ("Because improvements in the pollution reduction capabilities of technologies frequently occur with the passage of time, emission limitations for older facilities may be less stringent than emissions limitations achievable using more modern technologies.")). As suggested above, this standard is applied to both new and existing facilities and permit limits for existing facilities are not grandfathered into renewed permits. *See Riverkeeper II*, 475 F.3d at 121-23; *Riverkeeper I*, 358 F.3d at 186. To determine permit requirements that meet this standard, EPA looks to the best information reasonably available at the time of permit issuance.

The statement in the 1989 Permit that, "[t]he present design will be reviewed for conformity to regulations pursuant to Section 316(b) when such are promulgated," merely states the truism that at the time of the next permit reissuance, whatever design was then in place would be compared against any new regulations that had been promulgated as of that time. This language should not be read to suggest that the "present design" was somehow grandfathered for the purpose of compliance with § 316(b) in future permits *unless and until* new regulations are promulgated. Furthermore, if that had been the intent of the sentence, the condition would be inconsistent with the CWA and not binding for the present permit.[41]

Therefore, rather than grandfathering the BTA determination from 1989, EPA has carefully and properly assessed the currently relevant facts and applied the currently relevant law in order to develop limits under CWA § 316(b) for Canal Station's new permit. EPA's analysis is thoroughly explained in this Response to Comments document and the Fact Sheet that accompanied the Draft Permit.

The existing screens at Canal Station were designed many years ago primarily to prevent trash and other debris from entering the facility's condensers, rather than to maximize the survival of impinged aquatic life or prevent the entrainment of eggs and larvae. Technological improvements are available which provide possible methods of minimizing impingement mortality and entrainment. Therefore, it should not be surprising that EPA has identified a new BTA for this permit reissuance.

[41] Congress is well capable of specifying a grandfathering provision when it intends one, *see* 33 U.S.C. § 1326(c), and the absence of such a provision indicates that Congress did not want such grandfathering of past intake requirements.

In addition, Mirant comments that in 1983, based on a 1978 report, and again in 1988, EPA concluded that the impingement (or "entrapment" as it was referred to then) of fish on the Canal Station screens was minimal and within "expected levels." These comments, however, fail to address the issue of entrainment at Canal Station. Moreover, impingement rates at Canal Station have increased substantially since the first impingement study in 1978. Hall and Morrow (1978) estimated that Canal Station impinged 60 fish per billion gallons of cooling water flow. Sampling over a 12-month period from 1999-2000 by MRI resulted in an estimated 81,149 fish being impinged. Canal Station attributes some quantity of impingement to a chlorine injection problem and estimates the total due to impingement alone should be 74,446. If you assume that the plant operated at full capacity for all 365 days of the year, this assumption results in a cooling water flow of approximately 188 billion gallons. Dividing impingement losses by that very conservative estimate of flow, results in impingement rates of from 396 to 432 fish per billion gallons of flow. These impingement rates are a factor of 6 or 7 times greater than the estimates from the 1978 study. In addition, since the 1970s, relevant fish stocks have declined, which makes impingement mortality an even greater concern.

Comment IX.B.1.2:

Mirant comments that:

> The updated § 316(b) study submitted as part of the Canal Station's NPDES Permit Renewal Application compared more recent data collected in 1999 and 2000 with the 1978 study. It found that the new data confirm Hall and Morrow's finding that "impingement losses at Canal were generally among the lowest for any large-volume once through cooling power plant in the Northeast. Exceptions were episodic, and related to malfunction of the isolated chlorine dosage system in June, 1999 and episodes of impingement of juvenile clupeids in November and December, 1999." Evaluation of Cooling Water Intake Impacts on Aquatic Life and Potential Technologies to Reduce Impacts, p.7.
>
> EPA nevertheless implies that it is obliged to require technology changes before the appropriate Phase II studies have been completed because "[t]he impingement data collected by the permittee documents adverse impacts to large numbers of fish and invertebrates from the Cape Cod Canal due to the Canal Station's two CWIS." At no point does EPA explain what criterion or standard it used to arrive at the conclusion that the number of organisms currently impinged is large enough to justify imposition of these requirements. Facility operation has not changed appreciably over the past 30 years, and there is no evidence that levels of impingement mortality and entrainment have changed over that period, except perhaps as would be expected due to naturally occurring variability. Yet EPA's previous "best professional judgment" has led it to conclude consistently that the existing intake at the Canal Station is "BTA." The Agency offers no legitimate rationale for any change in that judgment at this time, nor is there one.

Response IX.B.1.2:

Impingement mortality and entrainment of aquatic organisms by Canal Station are adverse environmental impacts under CWA § 316(b). The design, location, construction and capacity of the facility's CWISs must reflect the BTA for *minimizing* these adverse impacts. Moreover, to trigger these requirements, it is not necessary for EPA to establish a particular level of damage to either a specific species or a biological community of species. EPA also is not, according to the *Riverkeeper II* decision, 475 F.3d at 97-100, 114-15, authorized to base its BTA determination on a comparison of costs and benefits.[42] As stated above, requirements under § 316(b) are "technology-driven."

As discussed above, the current data shows very large numbers of organisms lost to entrainment and impingement by Canal Station. Thus, it is obvious that the BTA standard of CWA § 316(b) applies to this permit and EPA has clearly explained its determination of the BTA in this document. The location of Canal Station's CWIS's, between two productive estuaries and including spawning and nursery habitat, coupled with the high volume of water withdrawal (518 MGD), results in high entrainment and impingement numbers which clearly trigger the application of the BTA standard to Canal Station. These losses are also unnecessary in that use of the BTA could substantially reduce them while allowing Canal Station to continue to profit from the generation and sale of electricity. Furthermore, these entrainment and impingement losses are occurring against a backdrop of declining fish populations, which makes the losses an even greater concern.

Mirant's comment stating that one study (in 1978) found that impingement losses at Canal Station were generally low for large-volume, once-through power plants in the Northeast, does not establish that impingement losses are so low that no action is necessary to meet the BTA standard under § 316(b). Furthermore, data from 1999 to 2000 show that impingement rates have increased by a factor of 6 or 7 over the results of the 1978 study. In the 1999-2000 study, over 81,000 fish were estimated to have been impinged at Canal Station. Given the flaws of Canal Station's fish return system, as discussed above (*e.g.*, fish being discharged at a location that promotes re-impingement, fish being exposed to high levels of chlorine during impingement and return to the water source, predation of fish that are dropped through the air to the surface of the water), a high degree of impingement mortality would be expected. This represents a significant quantity of fish impingement mortality that can and should be reduced through the use of the BTA. In addition, as evidenced by the events in the fall of 1999, Mirant Canal has the potential to impinge entire schools of fish at once. These individually large impingement events are also of concern. Finally, Mirant's comment focuses on impingement rates but ignores the important issue of entrainment losses.

In addition, Mirant's comment points to EPA's BTA conclusions for earlier permits, but, as explained above, those conclusions are not binding on this permit. EPA has clearly explained its conclusions for this permit based both on current information and the current understanding of the law. The explanation provided for the earlier decisions is sparse, with particularly little attention given to entrainment, and the basis of these earlier decisions is not clear to current EPA personnel. Whatever the basis for these earlier decisions, however, EPA has now adequately

[42] As indicated above, this ruling from *Riverkeeper II* will be subjected to future review by the United States Supreme Court.

explained its current decision herein based on current information and the current state of the law.

Finally, Mirant's comments concerning the timing of Phase II studies are unavailing because, among other reasons, the Phase II Rule has been suspended.

Comment IX.B.1.3:

Mirant comments that:

> In the absence of any legitimate justification, EPA's proposal to impose new technology requirements based on a conceptual-level evaluation of technology alternatives submitted before Mirant Canal has had an opportunity to evaluate and select among its compliance options pursuant to the Phase II Rule is inconsistent with both the letter and the spirit of the Phase II Rule. It clearly is not based on Mirant Canal's selection of a compliance option under the Phase II Rule and resulting proposal for assuring compliance with performance standards using that option.

Response IX.B.1.3:

Mirant's comment complains that new technology requirements should not be imposed on the basis of a "conceptual-level evaluation of technology alternatives" until Canal Station gets the opportunity to choose from among the Phase II Rule's compliance options. This comment is unavailing because, as explained above, the Phase II Rule has been suspended. (EPA has also explained why a BPJ-based permit decision would have been appropriate even under the terms of the Phase II Rule.)

While the above paragraph adequately responds to Mirant's comment, EPA also notes that the level of detail supporting the evaluation of technology alternatives was reasonable and adequate to support EPA's BTA determination for its NPDES permit. The alternatives analysis here, which included consideration of the information contained in the Alden Report, involved a Canal Station-specific evaluation of a variety of alternative technologies, including the degree to which they could reduce impingement mortality and entrainment, an estimate of their cost, an assessment of their feasibility, and consideration of their non-water environmental (and energy) effects. Moreover, EPA considered all the information submitted by Mirant for this permit development. This was more than a purely "conceptual-level" analysis and, in any event, is adequate to support the BTA determination for this NPDES permit.[43] In identifying the BTA for this NPDES permit, EPA is not required to complete a detailed design for, or obtain the permits for, the new facilities at Canal Station.

[43] As Mirant states in its comments on the Draft Permit, "Mirant Canal also has evaluated a number of technology options, although it has not had an opportunity to do detailed site-level engineering of any alternative," Mirant Comment IX.B.2.4. Neither EPA nor Mirant are required to have completed "detailed site-level engineering" at the time of NPDES permit development and issuance. Of course, if Mirant *had* done such detailed engineering and submitted the information to EPA, the Agency would have considered it in the permit development.

Comment IX.B.2.1:

Mirant comments that:

> Section 125.95(a)(2)(ii) of the Phase II rule provides that, between the time a permit expires and the time an NPDES permit containing requirements consistent with the Phase II rule is issued, permit writers will continue to determine BTA requirements on a BPJ basis. 69 Fed. Reg. 41,687 (July 9, 2004). EPA apparently views this provision as giving it *carte blanche* to impose any new § 316(b) requirements it chooses, even if they are potentially inconsistent with the conclusions the permittee might reach once its studies have been completed, so long as they can be justified by the permit writers' "best professional judgment." Such an interpretation would undercut one of EPA's stated purposes in developing the Phase II Rule, which was to bring some measure of consistency to the § 316(b) determination process. 67 Fed. Reg. 17,121, 17,124 (April 9, 2003).

Response IX.B.2.1:

Mirant comments, in essence, that it believes that under the Phase II Rule a BPJ-based permit issued under 40 C.F.R. § 125.95(a)(2)(ii) must not contain conditions inconsistent with the conclusions that would have resulted from completion of the entire Phase II Rule permit development process. This comment establishes no infirmity in EPA's new permit.

EPA does not believe that it has "*carte blanche*" in developing permit requirements for CWISs. EPA must justify its BPJ determination of CWIS requirements for the Final Permit by demonstrating that they comply with the terms of CWA § 316(b). EPA does not need to establish that those requirements are consistent with what would have been the result of the process under the Phase II Rule. The Phase II Rule has been suspended and requirements under § 316(b) are to be based on the Agency's BPJ. *See* 72 Fed. Reg. 37,107 (July 9, 2007); 40 C.F.R. § 125.90(b).

Second, even if the Phase II Rule was still in effect, Mirant's comment goes too far. The Phase II Rule plainly authorized a BPJ-based determination under § 316(b) for permits like Canal Station's that were ready to be issued prior to completion of the entire Phase II Rule process. *See* 40 C.F.R. § 122.95(a)(2)(ii). It would have been meaningless for EPA to provide for a BPJ decision in these circumstances if the Rule also intended to prohibit any possible inconsistency of that BPJ decision with the decision that would have resulted from the application of the full Phase II process. It also would have been impossible to know in advance what the result of completing the full Phase II Rule process would have been because, as Mirant has alluded to, the Rule provided five different compliance options, including the possibility of site-specific standards. The only way to be certain of avoiding any possible inconsistency would have been not to allow for a BPJ permit and to require all permitting to await completion of the full Phase II process. EPA did not take that approach in the now-suspended Phase II Rule.

Although BPJ permits under the Phase II Rule were not required as a matter of law to be consistent with whatever would have resulted from completion of the Phase II Rule's standards setting process, EPA has explained above that under the unusual facts of this case the Agency was concerned about the possible inequity of a permit that required far more expensive entrainment reduction provisions than might have been required under the Rule. More specifically, while the record indicated that closed-cycle cooling would be substantially more effective at reducing entrainment than the other options reviewed, it was possible that other less expensive, albeit less effective, options could have qualified as the BTA under the Phase II Rule if Canal Station was approved for site-specific standards. The uncertainties were especially difficult here because it was unclear just how effective the screening systems would be. It was only clear based on the record at hand that the screening systems would be less effective and less expensive than closed-cycle cooling. In light of these unusual circumstances, EPA exercised its discretion to address entrainment by simply incorporating the Phase II Rule's information submission requirements into the Draft Permit in order to support a future determination of specific BTA-based requirements. The Draft Permit also required implementation of the BTA requirements once they were delineated. With regard to impingement mortality reduction, however, EPA concluded that based on the record at hand it was able to identify some specific, relatively inexpensive CWIS design measures that would reduce impingement mortality. As a result, EPA's Draft Permit required implementation of these steps as part of the BTA. The approach taken by EPA to derive the Draft Permit's limits for Canal Station was consistent with the Phase II regulations and all accompanying guidance and was reasonable under the facts of this case.

With the suspension of the Phase II Rule, the above uncertainties and equitable issues have been clarified and EPA has now determined for the Final Permit that closed-cycle cooling represents the BTA for Canal Station.

Comment IX.B.2.2:

Mirant comments that:

> EPA apparently views this provision [40 C.F.R. § 125.95(a)(2)(ii),] as giving it *carte blanche* to impose any new § 316(b) requirements it chooses, even if they are potentially inconsistent with the conclusions the permittee might reach once its studies have been completed, so long as they can be justified by the permit writers' "best professional judgment."
>
> That view also would be inconsistent with prevailing case law, which requires that permit writers set BPJ requirements as close as possible to what they can discern the national technology-based standards for the industry as a whole would require. In issuing permits on a case-by-case basis using its "Best Professional Judgment," EPA does not have unlimited discretion in establishing permit effluent limitations. The authority to make this determination comes from CWA § 402(a)(1), which allows EPA to issue permits containing conditions "necessary to carry out the provisions of this chapter" prior to the agency promulgating the implementing regulations required by the CWA. 33 U.S.C. § 1342(a)(1); *see* EPA, NPDES Permit Writers' Manual at 68, EPA-833-B-96-003 (1996).

> Therefore, BPJ is supposed to be the permit writer's "highest quality technical opinion" of the permit conditions required by the CWA, taking into account "all reasonably available and pertinent data and information." NPDES Permit Writers' Manual at 68.

Response IX.B.2.2:

In its comment on the Draft Permit, Mirant correctly summarizes EPA's position that, under 40 C.F.R. § 125.95(a)(2)(ii), it could have imposed § 316(b) requirements "even if they are potentially inconsistent with the conclusions the permittee might reach once its studies have been completed, so long as they can be justified by the permit writers' 'best professional judgment.'" EPA explains its thinking in the response immediately above. While EPA agrees with Mirant that the Agency's authority to develop permit limits on a BPJ basis is not unbounded, EPA's current permit determination, as reflected in the Fact Sheet for the Draft Permit and this Response to Comments document, is well within the legal bounds of its BPJ authority.

Mirant argues that any BPJ requirements under 40 C.F.R. § 125.95(a)(2)(ii) must be as close as possible to the national technology-based standards for the industry as a whole. Yet, as discussed above, the regulation plainly stated that BTA requirements should be determined on a BPJ basis for facilities such as Canal Station and BPJ permits are developed in light of site-specific facts. Moreover, there was no way in advance to know what requirements would have been imposed following completion of the Phase II process.

In any event, with the suspension of the Phase II Rule, no prevailing categorical technology standards exist, so EPA plainly applies the requirements of CWA § 316(b) on a site-specific, BPJ basis, without regard to the Phase II Rule's former requirements.

Mirant also comments that BPJ should reflect the permit writer's "highest quality technical opinion" of the permit conditions required by the CWA, taking into account "all reasonably available and pertinent data and information." EPA's BPJ application of CWA § 316(b) to Canal Station meets the criteria suggested by Mirant, and the Permittee has not pointed to any reasonably available pertinent data or information that EPA failed to consider.

Comment IX.B.2.3:

Mirant comments that:

> It is not enough for EPA to say that Mirant Canal will have an opportunity to evaluate its compliance options under the Phase II Rule during subsequent permit renewals. Obviously, once Mirant Canal has invested in a CWIS technology, that investment is a sunk cost that cannot be recouped. If the requirements imposed are different than the Rule requires, then even if the permit requirements can be altered, that would provide no remedy with respect to the initial capital costs. Indeed, because the Draft Permit requires Mirant Canal to present a PIC and CDS for compliance with both the impingement mortality and entrainment standards, there is no guarantee that those studies will not identify technologies just as stringent as, but inconsistent with, the "BPJ" technology EPA has identified. Of course, it is entirely possible that, after the more detailed analysis

> of options contemplated by the Phase II Rule, including more detailed engineering review of the structural and operational changes the Draft Permit proposes, Mirant Canal may conclude that some or all of the elements EPA proposes to require would form part of the most cost-effective compliance option. Were EPA to require structural changes at Canal Station before the study proceeds, however, those required changes inevitably will shape, if not dictate, any subsequent evaluation of other alternatives, since any analysis of alternatives must consider what already is in place. In short, if EPA were to go forward with permit requirements that preclude Mirant Canal from completing its evaluation of compliance alternatives at the most logical time, it will have in effect foreclosed any truly meaningful consideration of those options.

Response IX.B.2.3:

The BPJ-based BTA determination developed by EPA for the current Final Permit constitutes a facility-specific application of the CWA § 316(b) BTA technology standard. This is the proper way to proceed in the absence of an applicable national categorical standard.

Under 40 C.F.R. § 125.95(a)(2)(ii), it was also entirely appropriate to have proceeded on a BPJ basis even when the Phase II Rule was in effect, as EPA has explained in detail herein and in the Fact Sheet. The significant and ongoing entrainment and impingement impacts, as well as various pollutant discharge issues, militated in favor of moving forward expeditiously with the permit issuance by developing limits under § 316(b) on a BPJ basis, rather than delaying the entire permit until completion of the full Phase II permit limit development process. Specifically:

> The adverse environmental impacts associated with the operation of the CWIS at Canal Station include the entrainment of eggs and larvae and the impingement of fish and shellfish. Entrainment and impingement seriously injure or kill a large percentage of the organisms involved. As currently operated, the plant can take in up to 518 million gallons per day of water from the Cape Cod Canal, entraining or impinging organisms present in that water. As previously discussed in Section 5.2.2.c of this Fact Sheet, Canal Station estimates that, on an annual basis, the Station entrains somewhere between 2.6 and 3.6 billion eggs, and 187-318 million larvae and that over 71,000 individuals are impinged.
>
> The adverse effects of entrainment and impingement by the plant's intake structures could be avoided or reduced by the installation of existing, practicable cooling water intake technologies and the implementation of practicable operational measures at Canal Station. Some combination of steps will be needed to meet the CWA § 316(b) requirement that the design, location, construction and capacity of cooling water intake structures reflect the BTA for minimizing adverse environmental effects.

See Fact Sheet at Sections 5.2.2 and 5.2.4. *See also, generally*, EPA General Counsel Opinion (December 4, 1972), quoting legislative history of Federal Water Pollution Control Act, H. Rept. No. 92-911 at 126 (1972) ("Nevertheless, it would be unreasonable to delay issuing of permits until all the implementing steps are necessary. Therefore, subsection (a)(2) provides that prior to

the taking of the necessary implementing actions relating to all such requirements, the Administrator may issue permits during this interim period [prior to promulgation of ELGs under Section 304] with such conditions as he determines are necessary to carry out the provisions of this Act.").

As to the Permittee's concern that it might have been subject to conflicting permit terms if the Draft Permit's BPJ limits ended up differing from later Phase II limits, this hypothetical concern has been mooted by the suspension of the Phase II Rule. Still, EPA acknowledges that the NPDES permitting process can face difficulties of timing and sequencing when permits are slated to be issued against a backdrop of recently promulgated categorical standards which may be complex, difficult and time-consuming to implement. Permitting can also pose challenges when being conducted against a backdrop in which litigation may undermine new categorical standards, or when new standards are expected to be promulgated at an uncertain time in the future. In part, these issues are addressed under the CWA by the use of BPJ permit limit development in the absence of national categorical standards. BPJ-based permitting relies on a site-specific application of the statute's technology standards and results in a decision that takes direct account of the facts of the facility in question. In addition, 40 C.F.R. § 122.43(a) and (b) indicated that EPA permits should comply with all applicable statutory and regulatory requirements and that such "applicable requirements" include all provisions of the law and regulations that are in effect at the time of permit issuance. Finally, the Agency also has reasonable discretion to decide whether or not to delay permitting in light of changing or potentially changing legal requirements.

In the Phase II Rule, EPA addressed certain of these difficulties by providing for BPJ permits in certain limited circumstances, and for a limited period of time, during the transition period to the new Rule. *See* 40 C.F.R. § 125.95(a)(2)(ii). Consistent with this, while the Phase II Rule was in effect, EPA Region 1 balanced the need for updated permit requirements for Canal Station's CWISs and pollutant discharges, in light of the facility's ongoing environmental impacts and the delay that would have been associated with waiting for full implementation of the Phase II permit development process, by moving forward with a BPJ-based determination under § 316(b) that was informed by the terms of the Phase II Rule. Given that Canal Station's Permit was last issued roughly 19 years ago, and that there was evidence in the record of significant impingement and entrainment impacts, EPA determined that that it was reasonable to proceed with permit issuance on a BPJ basis as expressly authorized by the Phase II Rule. At the same time, however, EPA's BPJ was informed by the substantive terms of the Phase II Rule. Therefore, with regard to entrainment reduction the permit only required that Canal Station follow the Phase II Rule's procedures for information submissions to support a later BTA determination and then implement the resulting BTA. With regard to impingement mortality reduction, recognizing the obvious flaws in Canal Station's fish return system, EPA proposed on a BPJ basis that specific, relatively inexpensive CWIS design improvements be undertaken to represent the BTA at Canal Station. EPA was aware that this decision could possibly influence the Permittee's compliance options under the Phase II regulations, but such a speculative factor could not justify allowing the continuing environmental degradation that would result from a delay in the permitting process and imposition of BTA requirements.

It should also be noted that the entrainment reductions now being required on a BPJ basis in the Final Permit after the suspension of the Phase II Rule do not eliminate the need to reduce impingement mortality with effective fish return systems or other BTA measures. The Final Permit includes a term, however, that allows Mirant to seek to modify the permit if it believes and can demonstrate that the specific impingement mortality reduction requirements in the permit will be superfluous in light of the steps that will be taken to comply with the permit's entrainment reduction requirements.

It also should be stated that EPA has currently decided for several reasons not to hold up the Canal Station Final Permit to await the promulgation of a new Phase II Rule at some unknown time in the future. First, there is simply no way of knowing how long a delay that would entail. The Agency has yet to issue a new proposed Phase II Rule, much less a new final Rule. Second, in suspending the Phase II Rule, the Agency expressly stated that permitting under CWA § 316(b) should proceed on a BPJ basis. Third, Canal Station's cooling water withdrawals are entraining and impinging large numbers of marine organisms and these adverse environmental impacts can and should be minimized by the application of the BTA. Fourth, in addition to imposing new CWIS-related conditions, the new permit will also impose new limits on various pollutant discharges and these improvements would also be held up if the permit was further delayed to await future new Phase II regulations. Fifth, a new permit for Canal Station is long overdue given that the currently effective permit was issued by EPA in 1989, some nineteen years ago. Finally, it would be inconsistent with the goals of the CWA – which include the restoration and maintenance of the chemical, physical and biological integrity of the Nation's waters – to delay the permit for an indefinite period while awaiting a new Phase II Rule.

Comments IX.B.2.4:

Mirant comments that:

> EPA's proposal to require Canal Station to undertake substantial impingement mortality and entrainment monitoring *for the life of the permit* also exceeds the Agency's authority under the Phase II Rule, and will serve no legitimate purpose. That monitoring, which experts consulted by Mirant Canal have estimated will cost between $125,000 and $180,000 *annually*, goes far beyond anything needed to provide a scientifically valid estimate of impingement mortality and entrainment at the facility, which is all that the rule requires. Moreover, as noted above, the Phase II Rule expressly allows permittees to use existing data.
>
> In this case, Mirant Canal already has developed substantial biological data and other information of the type required by the Phase II Rule, such as characterization of species and life stages in the vicinity of the CWIS, and impingement mortality and entrainment data sufficient to evaluate inter-annual variability. *See* 40 C.F.R. § 125.95(b), 69 Fed. Reg. 41,687-89. Mirant Canal also has evaluated a number of technology options, although it has not had an opportunity to do detailed site-level engineering of any alternative, nor has it had an opportunity to evaluate some of the compliance options available under the rule (such as restoration or alternative performance standards) or to develop a TIOP. In fact, Mirant Canal believes that it has collected and submitted much

of the biological information it would need to satisfy the basic requirements of the Phase II Rule. Mirant Canal recognizes that it is important to synthesize that information in a format that corresponds to the Phase II Rule's requirements. Mirant Canal might also need to collect some additional information, should it decide to pursue the compliance option authorized under § 125.94(a)(5) of the Phase II Rule, or to incorporate restoration in its compliance plan as authorized by § 125.94(a)(3). Unless it does so, however, Mirant Canal submits that it has done all that the Rule requires for characterizing entrainment and impingement mortality at the site. EPA's additional requirements are simply unauthorized.

Response IX.B.2.4:

Mirant comment urges that the impingement mortality and entrainment monitoring requirements proposed in the Draft Permit exceed EPA's authority under the Phase II Rule and are excessive and unnecessary. EPA disagrees with these comments.

First, EPA does not base the Final Permit's monitoring requirements on the now suspended Phase II Rule. Second, EPA does not view the monitoring requirements as either excessive or unnecessary. EPA discusses the legal and technical basis of the monitoring requirements in additional detail in responses to comments IX.C.1 and IX.C.2, below.

In addition, EPA notes here that regardless of the suspension of the Phase II Rule, EPA agrees with Mirant that, in general, permittees may use existing data to address contemporary permitting questions when that data is valid (*e.g.*, properly collected, representative of pertinent conditions) and relevant to the issues at hand. Of course, such valid, relevant existing data may or may not be sufficient by itself in a particular case to satisfy the data needs at hand. In this case, EPA does not agree that there is presently sufficient biological data collected for Canal Station to provide an adequate understanding of the range of year-to-year and season-to-season variation in impingement and entrainment rates. Based on the variability in the observed impingement rates to date, a one-year formal impingement study is inadequate to reasonably characterize variability at the Station. For example, impingement was substantially greater in November and December of the study year, driven primarily by impingement of Atlantic menhaden, Atlantic silversides, and herring species. One year of data is insufficient to determine if large winter impingement events are common or typical. Further, two years of entrainment sampling data is insufficient to characterize entrainment at Mirant Canal Station due to substantial annual variability. For example, the difference in the documented entrainment of cunner larvae between 1999/2000 and 2000/2001 was over 66 million individuals, which represents an adult equivalency of 202,249 individual fish. Similarly, entrainment of sand lance larvae was reported to have increased by over 54 million fish from 1999/2000 to 2000/2001, representing an adult equivalency of 101,664 individual fish. In addition, it may be important to monitor entrainment and impingement after new technology is implemented in accordance with the Final Permit in order to assess the technology's performance. If Mirant believes that compliance with the permit's entrainment and impingement reduction standards obviates the need for some or all of the monitoring, it may request a permit modification under Part I.A.9.e of the Final Permit.

Comment IX.B.2.5:

Mirant comments:

> EPA implies it must move forward with new and more stringent BPJ requirements for the CWIS because working through all the potential Phase II issues could be a difficult, time-consuming process. Fact Sheet, pp.26-27. This simply is not the case. Although Mirant Canal does not contend that its submissions fully satisfy the Phase II Rule and agrees that some limited data collection could be needed, Mirant does not agree that the process is likely to be so difficult or time-consuming as to justify the approach EPA proposes. Indeed, the schedule EPA has included in the Draft Permit would not allow it. Even if EPA were to issue the permit immediately, and the Canal Station were to immediately begin collecting the data EPA proposes (which is not possible, given the start-up time needed to arrange for sampling), it would have only seven months of additional data to use for purposes of developing the PIC, and only, as a practical matter, a few months more to use in crafting the CDS. In short, this extensive data collection effort is little more than arbitrary make-work.

Response IX.B.2.5:

Mirant disagrees with EPA's conclusion that it could have been time-consuming and difficult to carry out the full Phase II permit limit development process, arguing that it would not take that long given that the Draft Permit did not allow much time for data collection before the PIC and CDS would be due. Mirant also argues the short time allowed for data collection, and the short turnaround time allowed for the CDS, will render the data "arbitrary makework."

EPA disagrees with these comments for a variety of reasons. First, the schedule for developing a PIC and CDS has been removed from the Final Permit in light of the suspension of the Phase II Rule. (See Response to Comment IX.A). Furthermore, Mirant has already submitted a PIC in October, 2006. EPA also believes it was fair to conclude that carrying out the full Phase II permitting process could have been time-consuming and difficult given that, as Mirant's comments have alluded to, the Rule invited the Permittee to choose from among a variety of compliance options, including seeking approval of restoration programs and/or site-specific performance standards based on various criteria. The various compliance options had the potential to raise complex issues that could have taken significant time to evaluate and Mirant had not yet requested approval for a particular option or submitted the information required to support its selection. Part I.A.8.c. of the Draft Permit also required Cooling Water System Data pursuant to the 316(b) Phase II Regulations. In light of the suspension of the Phase II Rule, this requirement (i.e. information required by 40 C.F.R. § 122.21(r)(5)) has also been removed from the Final Permit. Regarding the substantive need for biological monitoring data, see responses IX.C.1.1 and IX.C.1.2.

Comment IX.B.2.6:

Mirant comments that:

> Nothing in the Phase II Rule or in the information submitted to date dictates that EPA must impose new BPJ requirements at this time if it would be more appropriate to allow adequate time for further information development. Rather, it would be far more reasonable in this situation for EPA to carry over the existing BPJ provisions and to establish, as it also proposes in the Draft Permit, a reasonable schedule under which Mirant Canal will promptly complete the § 316(b) evaluation and application process contemplated by the Phase II Rule. Moreover, none of the other reasons that EPA gives for moving forward with more stringent requirements are adequate to justify going forward, especially when weighed against the hardship and unfairness to Mirant Canal of going forward without an adequate opportunity for option selection.

Response IX.B.2.6:

Mirant comments that EPA was not required by the Phase II Rule to develop new BPJ requirements for the new permit and that the Agency should have just "carr[ied] over" the BPJ-based conditions from the prior permit and additionally included a reasonable schedule for the facility to pursue the Phase II process. The company also argues that moving forward with new BPJ-based limits is unfair to Mirant Canal because it was not being given an adequate opportunity to select options under the Rule.

EPA disagrees with these comments for several reasons. First, the Phase II Rule has been suspended and CWA § 316(b) permit limits are currently to be developed on a BPJ basis. Therefore, moving forward on a BPJ basis is consistent with currently applicable law and EPA policy, as explained above. There is obviously no unfairness in precluding Mirant from selecting a compliance option from the provisions in the Rule, since the Rule is no longer in effect. Moving forward with appropriately justified BPJ-based permit limits, as EPA is doing here, is the proper course of action.

Second, even when the Phase II Rule was in effect, the Draft Permit was not unfair to Canal Station. As explained previously, the Phase II Rule itself, at 40 C.F.R. § 125.95(a)(2)(ii), specifically authorized BPJ-based § 316(b) limits for permits such as the Canal Station Permit. Moreover, as discussed above, and in the Fact Sheet, EPA's BPJ permit limits for the Draft Permit were informed by the terms of the then effective Phase II Rule. EPA has previously explained its reasons for deciding that it was appropriate in this case to issue a permit with BPJ-based limits under CWA § 316(b) rather than to wait for the Phase II information gathering and alternatives selection process to conclude. Applying BPJ for a new permit requires an analysis based on the currently applicable law and the relevant facts. While this analysis may lead the Agency to retain existing limits in a reissued permit, it may also lead to the imposition of different limits. Regardless of whether permit requirements stay the same or change, the important point is that EPA's BPJ decisions are driven by the available information in the permit record. It would not, therefore, have been appropriate merely to "carry over" existing requirements, as Mirant suggests, and claim that doing so was an adequate BPJ application of CWA § 316(b) regardless of the available information. For the Draft Permit, EPA believes it exercised its BPJ under the Phase II Rule in a reasonable way. For the Final Permit, EPA also believes it has properly applied CWA § 316(b) on a BPJ basis in light of the suspension of Phase II Rule.

Finally, Mirant has also had the opportunity in the permit process to provide input into EPA's BTA determination for the CWISs at Canal Station and, based on Part I.A.13.g and h of the Final Permit, will in the future have the opportunity (a) to select its preferred method of complying with the permit's performance standards, and (b) to seek a permit modification if it believes it can demonstrate that EPA has incorrectly selected the BTA for the facility. Mirant evaluated CWIS technologies during EPA's development of the Draft Permit and its report, *Evaluation of Fish Protection Alternatives for the Canal Generating Station Revised,* was submitted to EPA as part of Mirant's permit application on October 29, 2003. EPA carefully considered the information and analysis submitted by Mirant and Section 5.2.4 of the Fact Sheet summarizes the salient points of EPA's evaluation. Mirant also provided extensive comments on the Draft Permit and its supporting analysis, addressing § 316(b) issues largely in Section IX of Mirant's comments. EPA carefully considered Mirant's comments and the Agency's evaluation is evidenced in these responses to comments. Therefore, the Permittee has had multiple opportunities to submit its views regarding the selection of the BTA, and it will continue to have the opportunity to help define the specifics of the entrainment minimization BTA.

Furthermore, the marine organisms killed or otherwise injured by Canal Station's cooling system are public natural resources that are to be protected consistent with the terms of the Clean Water Act. There is nothing unfair to Mirant about EPA properly applying the statute to Canal Station toward this end, instead of delaying such proper application.

Section IX.C Mirant's Concerns Regarding EPA's Specific BTA and Related Requirements for the CWIS - Biological

Mirant comments that:

> Having concluded, without any meaningful substantive analysis, that current levels of impingement mortality and entrainment are of concern, EPA goes on to evaluate alternative cooling water intake structure technologies for application at Canal Station, and to propose a host of new structural, operating, and monitoring requirements as "BTA" for the Canal Station. Besides being unnecessary and *ultra vires* for the reasons discussed above, the requirements EPA proposes raise a variety of other technical and legal issues detailed below. For ease of reference, we address them in the order in which they appear in the Draft Permit.

Comment IX.C.1.1: Biological Monitoring

> For the reasons discussed above in Section IX.3, Mirant Canal objects to the requirements for conducting impingement mortality and entrainment monitoring beginning thirty days after the effective date of the permit and continuing thereafter for the life of the permit. This requirement is wholly unwarranted, is not authorized by the Phase II Rule, and is, to the best of our knowledge, wholly unprecedented.

> Whatever EPA's theory is for requiring this monitoring, it cannot prevail where it conflicts directly with the provisions of the Phase II Rule, as is the case here. The Rule specifically provides that *permittees* are to be responsible for proposing any sampling programs necessary to establish the calculation baseline and for developing a proposed verification monitoring program designed to confirm that the technology installed is achieving the compliance standards. EPA's biological monitoring requirements are neither authorized by the Rule nor necessarily adapted to the Canal Station's compliance obligations.

Response IX.C.1.1:

EPA issued the Permit to the Station with CWA § 316(b) limits based on its BPJ rather than determined by the substantive terms of the Phase II Rule. If any of the Permit's monitoring requirements associated with EPA's BPJ-based § 316(b) determination differed from monitoring requirements specified in the Phase II Rule, it would not have undercut the validity of the requirements in the Permit. To the contrary, the Permit's monitoring requirements are based on clear statutory and regulatory authority. Under section 402(a)(2), EPA has broad powers to impose NPDES permit conditions, including "conditions on data and information collection, reporting, and such other requirements as … [the Agency] deems appropriate," to assure compliance with sections 301 and 316 of the Act. In addition, Section 308 of the CWA grants EPA authority to require NPDES permittees to monitor "at such locations [and] at such intervals" as EPA prescribes, "whenever [it is] required to carry out the objective of [the Act]."

CWA § 316(b) governs requirements related to cooling water intake structures (CWISs) and requires "that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." The operation of CWISs can cause or contribute to a variety of adverse environmental effects, such as killing or injuring fish larvae and eggs by entraining them in the water withdrawn from a water body and sent through the facility's cooling system, or by killing or injuring fish and other organisms by impinging them against the intake structure's screens. Mirant Canal Station entrains approximately 2.6 to 3.6 billion eggs and 187-318 million larvae each year, with an additional 71,000 individuals impinged per year at Canal Station. EPA feels these estimates, coupled with the significant volume of water taken from the canal (518 MGD), represent a substantial level of impingement mortality and entrainment that warrants additional monitoring.

As explained in the Fact Sheet:

> EPA is requiring biological monitoring (before and after technological changes have been made at the Station) in the Draft Permit. Monitoring is needed to better determine the magnitude of environmental impacts associated with the CWIS, the effectiveness of BTA measures, and whether additional changes to the facility's CWA §316(b)-related permit requirements would be warranted in the future, either in a reissued or modified permit.

The monitoring and reporting requirements in this case are intended to assess the nature and extent of impingement and entrainment associated with the CWIS at the facility and, as such, they fall well within the overarching objectives of the Act, *see* CWA 101(a), as well as EPA's statutory authority to ensure that cooling water intake structures employ the best available technology to minimize mortality of aquatic organisms due to entrainment and impingement. *See also,*40 C.F.R. § 122.48.

Further, the monitoring requirements in the Canal Station Permit are consistent with, or less extensive than, the level of monitoring required at other large power generating facilities, such as Mirant Kendall Station, and Seabrook Station. Brayton Point Station has an extensive monitoring program far greater in scope and cost than the requirements in Mirant Canal's Permit.

Finally, the Phase II Rule has been suspended, thus mooting the claims of an inconsistency between the Rule and the permit's monitoring requirements. EPA has adequately justified the permit's monitoring requirements under the statutory and regulatory authorities cited above.

Comment IX.C.1.2:

Mirant comments that:

> Even if EPA were entitled to usurp the permittee's role under the Rule (which we submit it is not), the proposed monitoring requirements could not be justified. For example, the entrainment monitoring requirements are in no way related to assessing the performance of the technologies EPA proposes to require, all of which are designed to reduce impingement mortality rather than entrainment. Equally important, such extensive sampling seems inconsistent with EPA's desire to ensure that living impinged organisms are returned safely to the waterbody. In the absence of any information suggesting that current data are not adequate for this purpose, requiring the facility to collect and identify impinged organisms necessarily will cause additional, unnecessary mortality.

Response IX.C.1.2:

EPA has explained its reasons for the monitoring requirements above. Mirant's comment specifically attacks the entrainment-related requirements because the Draft Permit did not require entrainment reduction technologies. While true, EPA has explained above that entrainment monitoring is necessary to fully characterize the entrainment effects of Canal Station's operations, including specifying the species involved and the extent of seasonal and annual variability. It was understood that this information would contribute to the later determination of necessary entrainment reduction measures.

For the Final Permit, of course, EPA has decided to require entrainment reduction measures and the monitoring will also help to define the entrainment reductions achieved at the facility once the required improvements are made.

With regard to Mirant's concern that fish may be harmed in the monitoring process, it has been EPA's experience at multiple plants that impingement monitoring does not significantly increase

impingement mortality. Many of the fish that are ultimately measured and enumerated are already injured or killed once they are impinged on the screen. Diverting and holding them in water–filled basins, which is routinely done for this type of sampling, adds minimal additional stress compared to what the animal has already experienced. EPA is, of course, expecting that the permit's requirements will lead to much lower impingement mortality overall.

EPA also notes that, as discussed below, MA CZM called for even more extensive monitoring.

Finally, it also should be noted that as a more extensive database is compiled with regard to Canal Station, and as impacts are reduced as a result of permit compliance, it may well be possible to reduce the monitoring requirements in the future.

Comment IX.C.1.3 from Commonwealth of Massachusetts - Office of Coastal Zone Management

MA CZM commented that:

> Sections A.9.b and c. of the permit: The proposed entrainment and impingement monitoring frequency in the draft permit is not consistent with current monitoring recommendations from CZM and the Massachusetts Division of Marine Fisheries. For entrainment and impingement monitoring the recommendation is to sample three times per week March 1 through November 15 and two times per week November 16 to February 28, whereas EPA proposes three times per week March through August and three times every two weeks September-February. CZM recommends: 1) extending the weekly sampling through November 15, and 2) increasing the frequency of sampling from November through February.

Response IX.C.1.3:

As a general matter, more sampling, if well-conceived, is better than less sampling, because it can provide a more fully representative picture across time and space of the parameter being measured. Nevertheless, developing monitoring requirements requires a reasonable balancing of information needs with the cost of monitoring and in some cases other issues, such as feasibility. In this case, EPA concludes that the level of sampling required by the Permit will be sufficient to support a reasonable estimate of ongoing impacts at this facility and represents a reasonable balancing of informational needs against the costs of monitoring**.**

Comment IX.C.2: Marine Mammal and Sea Turtle Reporting Program and Response Protocol

Mirant comments that:

> In developing the Draft Permit, EPA evaluated the potential for Mirant's discharge to have adverse effects on endangered species found in the area and determined, correctly, that there will be no significant adverse environmental impact to the endangered species that migrate through or inhabit areas in the vicinity of the Station. Fact Sheet, p. 58. The ability of the organisms of concern to swim away from the intakes and the submerged

outfall, along with the rapid flows in the Cape Cod Canal, combine to eliminate any serious concerns. Indeed, the last recorded observation of a marine turtle in the vicinity of the intakes occurred almost 30 years ago, in 1977. Mirant Canal has never recorded an instance of a marine turtle or marine mammal being affected by its operations.

Nevertheless, in Part I.A.10 of the Draft Permit, EPA proposes to require Mirant Canal to submit and to implement a "Marine Mammals Monitoring Program and Response Protocol," under which the permittee would be obligated to report any sightings of marine mammals (whether or not they are listed as endangered species) in the vicinity of the Station. It is not clear what else might be required but the term "monitoring program and response protocol" suggests more than just reporting observations.

There is, however, no basis in EPA's or DEP's permitting authority under the federal Clean Water Act or the Massachusetts Clean Waters Act or their implementing regulations, or under the federal or state endangered species statutes, for the imposition of this reporting requirement, particularly given EPA's correct determination that the discharge will not have a significant impact on the species of concern. This provision should be entirely removed. Also, if it is retained despite that comment, it should be refined to specify just what "vicinity" of the Station is subject to observation by the Station personnel, and the label of the requirement should be changed to "Marine Mammal Reporting" to remove any uncertainty over its scope.

Response IX.C.2:

In September of 1999, a proposed protocol was drafted for Canal Station by its consultants, TRC, to delineate the steps for the proper handling of a marine mammal or sea turtle that may become entrapped within the intake system. A draft of this protocol was sent to NMFS and EPA on September 21, 1999, and subsequently accepted by both agencies. The intent of Part I.A.10 is to formally adopt this document as a condition of the Final Permit. In the case of entrapment of a sea turtle or marine mammal, Canal Station would be obligated to take these measures. In the effort to ensure that adverse environmental impacts are minimized from CWIS operations, it is appropriate under CWA § 316(b) to require operational steps that attempt to reduce or avoid harm to marine mammals or sea turtles that may be impinged by the Canal Station CWISs. Without suggesting that these steps are necessarily required at the present time by the Endangered Species Act and/or the Marine Mammals Protection Act, the fact that these statutes afford special protection status to these species underscores the reasonableness of requiring such a protocol in this permit under CWA § 316(b). If Mirant is correct that there is little or no likelihood of such species being impinged, then it will have little or nothing to do as a result of the requirement. Furthermore, to the extent that compliance with this requirement can rely on a protocol already developed by Canal Station, as appears to be the case, the company will also have little additional work to do as a result of the permit requirement.

Part I.A.10.b of the Final Permit merely calls for sightings of marine mammals *and sea turtles* to be recorded and the information to be submitted at the end of the year. It does not require additional monitoring, but simply requires observations by plant personal that may occur during the normal course of their duties (e.g., during daily discharge-related mortality monitoring) to be

recorded and forwarded to EPA at the end of the year. EPA feels this is well within the capability of the Permittee. In order to continue to evaluate the nature of the adverse impacts that may be threatened by the CWIS, it is reasonable and appropriate for EPA to call for this type of data collection and reporting. CWA §§ 402(a)(2) and 308(a) provide EPA with sufficient authority to require this type of monitoring and reporting in the permit.

EPA does not agree that the title of the existing, accepted protocol ("Marine Mammals Monitoring Program and Response Protocol") should be changed. In addition, EPA accepts the Merriam-Webster's Collegiate Dictionary (tenth edition) definition of "vicinity" as "the quality or state of being near: PROXIMITY." EPA believes that a marine mammal or sea turtle that can be seen from the Mirant Canal property is in the vicinity of the property.

Comment IX.C.3.1: Discharge Related Mortality Inspection and Reporting

Mirant comments that:

> Part I.A.11 at pp. 12-13 of the Draft Permit proposes to require Mirant Canal to conduct inspections of "shoreline areas" adjacent to the discharge canal (Outfall 001), once per operating shift, for "any sign" of environmental stress and/or fish mortality throughout the year and for the duration of the permit. A fish would be considered "dead" not only if it actually was dead, but if it has exhibited a "loss of equilibrium." If more than 25 "dead" fish were observed within any 24-hour period, Mirant Canal would be required, among other things, to notify EPA New England and DEP, apparently to collect all dead fish; to record data about the collected fish; to collect scale samples for the Massachusetts Division of Marine Fisheries; and to suspend all unit chlorination operations.
>
> There is no basis for this proposed requirement. There simply is no warrant for imposing a separate requirement for Mirant Canal to conduct thrice-daily, year round inspections in the Cape Cod Canal for impacts related to the discharge.
>
> Specifically, there is no reason to expect fish kills from the plant's unit chlorination operations, which operate only intermittently during a day, have existed for decades without having that effect, and are limited to levels of total residual chlorine well below any expected impact on fish. Nor is there is any reason to expect fish kills from the thermal component of the discharge. History does not show any such impact, and the Agencies have not shown that there is any lethality from the expected discharge, which will be limited to the same 107° F as in the current permit and involves discharges to a very high flow waterbody.
>
> This proposal is particularly troubling because there is no evidence that the plant's discharge has been or would be responsible for any fish kills. It is very likely that any dead fish identified under this program would clearly be related to some cause other than the plant's operations, such as commercial or recreational fisherman operating from the nearby marina. Yet under the proposed provision, even if the fish were observed to have drifted into the inspection area from upstream, the proposed requirements would take effect and Mirant Canal would be required to collect the dead fish and conduct the

required studies, Whatever that circumstance should be called, it cannot be justified as "discharge related mortality."

There is not a sufficient basis in the history of the Canal Station or any projection of its future for the Agencies to find that the Station's discharge is likely to cause fish kills. The requirement of Part I.A.11 should be removed from the final permit or revised to take account of these comments.

Also, it is entirely unreasonable to require such inspections on each shift. It is not clear how this could meaningfully be done at night. And walking along the riprap which makes up the shoreline at this location is not safe excepting up on the top of the bank, particularly in winter or in other inclement weather, so it is not likely that dead fish in the fast-moving water out over the diffuser would even be visible or collectible without arranging for a vessel. And for any observed fish, given the tidal surges and predation and scavenging, it is unlikely they will persist for long at any one place either in the Canal or along the banks.

This entire provision should be removed. If any similar provision is retained, at most it should provide that Mirant Canal shall observe the shoreline on the plant's side of the Cape Cod Canal to the extent visible from the walking path at the centerpoint of Outfall 001, once per operating day. If more than 25 dead fish are observed, Mirant Canal shall notify the Regional Administrator and the Commissioner within 24 hours as required by Part II of this Permit. When not in conflict with safety concerns or other company policies and procedures, the permittee shall make a reasonable attempt to collect a representative sample of the dead fish and hold them up to one week for review by DMF. Those fish identified as being washed off the traveling screens or dead fish floating from upstream shall be identified as such and placed in a separate category, along with the justification for making the determination.

Response IX.C.3.1:

EPA views this requirement as a responsible, inexpensive compliance check to ensure that the Station is not having unforeseen impacts on the receiving water. Permit limits have been known to be exceeded due to human error or equipment failures, thus raising the potential for fish kills from the discharge. If such problems occur, EPA and MassDEP want to be sure that a monitoring program is in place to identify them. If the inspections identify an issue, they could prompt the Permittee to locate and correct the problem in a timely manner. It also should be noted that in the past Canal Station has experienced mechanical problems with chlorine injection, which contributed to elevated fish mortality (Mirant Canal Permit Application; Attachment C.1, Appendix 1, page A1-8).

It should also be understood that thermal discharge patterns were evaluated with a sophisticated hydrological model, but little field data. EPA has concluded that the inspections are needed to help verify that the high temperature of water at the zone of discharge (which is above applicable

numeric criteria in MA Water Quality Standards) is not negatively impacting aquatic organisms. Although thermal discharges from Canal Station have not, as far as EPA knows, caused fish kills in the past, continued visual inspections will serve as an adjunct to the permit's thermal discharge limits and help to ensure that aquatic organisms are adequately protected under the permit. This is an appropriate requirement in light of the charge of CWA § 316(a), which is the legal basis for the permit's thermal discharge limits, to assure the protection and propagation of the balanced, indigenous population of fish, shellfish and wildlife in and on the receiving water. Once again, the Agencies have the authority to require such monitoring under CWA §§ 402(a)(2) and 308(a).

The provision in the permit does not require Canal Station to collect dead fish from the Cape Cod Canal every time they drift by the plant, but specifically addresses fish kills linked to the discharge canal or thermal plume. EPA finds it highly unlikely that a large number of fish killed by recreational fishermen will float in a concentrated mass into the discharge plume. The species of fish most likely to trigger this provision would be one of the schooling baitfish, which have in the past experienced cases of mass mortality in Mount Hope Bay from the combination of high temperature and chlorine discharged by the Brayton Point Station power plant. Those species are not targeted by fishermen and, thus, fishermen are highly unlikely to be the cause of any such mortality.

Further, visual inspection for discharge-related mortality is a standard provision for all large power plants that discharge large quantities of heat and large amounts of chlorine. It is a necessary precaution to help ensure that aquatic organisms are not negatively impacted by heated and chlorinated effluent.

For these reasons, EPA feels the provision should be retained to ensure that the balanced indigenous population does not suffer appreciable harm from thermal and chlorinated discharge. EPA feels that year-round visual inspection of the discharge canal from the paved walkway during each shift is a manageable task. However, in order to ensure the safety of plant personnel, and in line with the Permittee's comments, the Final Permit will be changed to require once-daily inspections of the shoreline areas adjacent to the discharge canal from the paved walkway and that the Permittee shall make a reasonable effort to collect a representative sample of the dead fish and hold them up to one week for review by the Division of Marine Fisheries.

Comment IX.C.3.2:

Mirant comments that:

> Also, the clause "shoreline areas adjacent to the discharge canal" is not defined or easily identifiable. Mirant Canal assumes it means only areas on its side of the Cape Cod Canal, but it is unclear how far up and down the shoreline must be inspected.

Response IX.C.3.2:

EPA will change the Final Permit to more precisely define the areas from which visual inspections are to be made as being confined within the limits of Mirant Canal's property.

Comment IX.C.3.3:

Mirant comments that:

> The other vague aspect of these requirements is the strange specification of the meaning of "dead fish." Mirant Canal proposes that a more biologically accurate (and "user-friendly") definition of a dead fish is: "a fish that shows no body or opercular movement and that does not respond to gentle prodding."

Response IX.C.3.3:

The term "dead fish" is used as a term of art under this permit. The definition of a "dead fish" as including one that exhibits a loss of equilibrium will serve as a reasonable trigger that an unusual event is in its early stages. The earlier a fish kill event is detected, the greater the chance that the cause can be determined and appropriate action taken to minimize the duration and severity of the event. The ecological function of a fish is severely limited when it is stressed to the point of losing equilibrium and it is unlikely that such a fish will recover unless the stress is promptly reduced or eliminated.

Comment IX.C.3.4:

Mirant comments that:

> Finally, the Draft Permit does not propose a definition of the potentially ambiguous term "fish." Mirant Canal assumes because these fish must be observable from a visual inspection that "fish" refers to free swimming, readily observable fish and not larvae or other life stages that cannot swim or that are not readily observable by a visual inspection.

Response IX.C.3.4:

EPA defines fish *in this particular monitoring context* as a cold blooded aquatic vertebrate large enough to be visible to the naked eye. The intention of this definition is, in this context, to exclude the egg and larval life stages of these organisms.

Comment IX.C.4: Inspection and Reporting of Unusual Impingement Events

Mirant comments that:

> Although a similar condition was included in the previous permit, that condition was imposed before EPA had established the Phase II Rule. Now that EPA has established applicable requirements, Mirant Canal believes that this requirement should be deleted. To the extent EPA nevertheless retains this provision, it should confirm that the

procedures Mirant Canal currently follows for assessment and reporting satisfy this requirement.

Response IX.C.4:

The Phase II Rule has been suspended. The permit requirement has been retained and the Permittee is required to follow the procedures detailed in Part I.A.12 of the Draft and Final permits regarding unusual impingement events. Permits are designed to specify required procedures and do not expressly confirm the validity of a facility's preexisting procedures.

Comment IX.C.5 from Commonwealth of Massachusetts - Division of Marine Fisheries

MA-DMF comments that:

> In an effort to improve estimates of the size range of fish species affected by impingement and/or discharge related impacts, *Marine Fisheries* requests additional individuals should be measured for total length. We recommend that a maximum of fifty fish be measured during the course of biological sampling for the occurrence and abundance of species impinged a Part I.A.9.c.v., as a result of discharge related mortality at Part I.A.11.c.i.(1), and as a result of unusual impingement events at Part I.A.12.b.ii.(1). *Marine Fisheries* no longer requires the collection of scale samples from fish associated with discharge related mortality at Part I.A.11.c.i.(1)(b) and recommends discontinuing this requirement in the Draft Permit.

Response IX.C.5:

It has been EPA's experience at multiple facilities in New England that large fish kills occurring at power generating facilities generally result from schools of one species of similarly sized fish. The permit requires length measurements of 25 individuals to provide a reasonable estimate of fish size. If multiple species are involved in any mass mortality event, up to 25 individuals of each species would need to be measured. EPA believes that measuring up to 25 individuals per species will provide an adequately representative sample and that measurement of up to 50 individuals is not necessary. EPA will omit the requirement for collection of scale samples from the permit.

Section IX.D Concerns Regarding EPA's Specific BTA and Related Requirements for the CWIS - Structural and Operational Requirements

Comment IX.D.1: Removal of sediment from Unit 2 intake sill

Mirant comments that:

> Part I.A.9.d of the Draft Permit would require Mirant Canal, within six weeks of the effective date of the permit, to inspect and remove sediment build-up from the face of the

> Unit 2 intake sill to return the sill to its original design capability. Thereafter, Part. I.A.13.a requires the Station to remove sediment build-up "periodically."
>
> EPA does [not] appear to have considered how much effort this would entail or what kinds of permits, if any, would be required for dredging and disposal of dredged material. Although Mirant Canal has not had an adequate opportunity to determine the volume of sediment involved or to determine whether permits would be required, it is highly likely that completing the required work pursuant to the proposed permit terms would be impossible. *See* Section XII. Moreover, depending on when the permit is issued, weather conditions may limit Mirant Canal's ability to conduct the required dredging. And, depending on the season, there may be little reason to remove sediment to reduce impingement, if impingeable organisms are not present at that time.
>
> In any case, because this is part and parcel of the technology requirements EPA has developed on a "BPJ" basis, Mirant Canal asks that it be allowed to assess it as part of the PIC process, rather than having it included in the permit at this time.

Response IX.D.1:

The Draft Permit requires the removal of sediment within 6 weeks of permit issuance. Mirant claims that this schedule is impossible. The time that will be required to remove the sediment will depend on, among other things, whether the facility has existing permits that allow for maintenance dredging, the time needed for securing local permits (if necessary), and the availability of a dredging contractor as described below. Since the sill was designed and installed as a measure to reduce impingement of benthic organisms, it is reasonable for EPA to request that this design feature be maintained in working order. Indeed, any failure to take reasonable, appropriate steps to keep this feature in working order might be a violation of the existing permit. See Part II, Section B.1.

<u>Dredging Options</u>

Dredging can be performed either using hydraulic dredging or mechanical dredging equipment and can be performed either from shore or using barge-mounted equipment. Hydraulically dredged material may be delivered to an upland dewatering and onsite disposal area or to a constructed onsite dewatering system, from where it will be hauled by truck to another site. Mechanically dredged material could be trucked offsite. Based on conversations with the U.S. Army Corps of Engineers (USCOE), as long as the material is relatively clean sand, finding suitable disposal sites nearby should be relatively easy as there is a demand for this type of material in the area (see USCOE 2006a). Since the material consists of sediment deposited into a previously dredged area, it is likely that it does consist of relatively clean sand (USCOE 2006a). Dredging is the only option for removing the sediment in front of the intake sill.

The facility would need to conduct a simple engineering study to determine project requirements, removal methods, disposal methods, and estimated costs. This would involve

scoping out the existing water depths in the area of concern and then developing a dredging plan including drawings of the planned operation. Since this is more of a maintenance operation in a location where dredging has been performed in the past, this engineering study should take no more than a week to perform (USCOE 2006b). The next step is to ensure that the dredging operation is authorized and that all required permits/authorizations are in place before work begins.

Permitting

Consultation with the USCOE indicated that because the dredging will occur within the Cape Cod Canal, the dredging operation will require a Rivers and Harbors Act Section 10 Permit regardless of the volume involved. Depending on the proposed disposition of the dredged material, a CWA § 404 Permit, an Ocean Dumping Act Section 103 Permit, or some other type of authorization may be required. Additional requirements may also apply for a Section 401 Water Quality Certification from the Massachusetts Department of Environmental Protection (MassDEP) and a Coastal Zone Management Consistency Concurrence from the Massachusetts Office of Coastal Zone Management (CZM) (see CZM 2006). Requirements from these authorities may be addressed concurrently.

If the facility does not have a Section 404 Dredge & Fill Permit or an Ocean Dumping Act 103 Permit, the following steps would be necessary to obtain them:

1. Conduct dredged material suitability determination - involves collecting samples as directed by the USCOE and submitting them for testing. If the sediments are relatively uncontaminated, as expected, this step should take approximately 1 to 2 months (USCOE 2006a).
2. Submit permit application.
3. USCOE develops draft permit.
4. Draft permit is available for public comment - typically 30 days.
5. Final permit is issued.

According to a USCOE representative, the entire process could take up to 4 months to complete (USCOE 2006a).

The Section 404 permit is valid for 5 years, at which time the permit would need to be renewed. The application requirements for permit renewal would be reduced since this is a maintenance-type activity. Following permit issuance, the facility would need to contact and negotiate a contract with a dredging contractor.

In light of the above, EPA agrees that more than six weeks may be needed to secure all permitting requirements and contracts for the removal of the sediments from the face of the Unit 2 intake sill. Reference to the six week time limit has been removed from Part I.A.9.d of the Final Permit. Rather, the permit will specify sill maintenance as an ongoing requirement for which immediate compliance is required. Indeed, EPA believes that Mirant should have been, and should continue to be, maintaining the sill on an ongoing basis so that the sill will optimally perform its intended function of reducing the impingement of benthic organisms. EPA expects

to address the question of the time needed to comply with this requirement in a separate Administrative Compliance Order, along with certain other compliance deadlines.

Regarding Mirant's request that assessment of removing sediment from the area around the CWIS be part of the PIC process, EPA notes that Mirant has already had that opportunity with its PIC submission in October 2006, and the remainder of the "PIC process" is no longer required by regulation or the permit because of the Phase II Rule's suspension. It should also be noted that Mirant has had ample opportunity to assess BTA technologies.

References

U.S. Army Corps of Engineers. Adams, Karen. Branch Chief. Telephone contact Report RE: Questions about permitting requirements and dredging sediment from the area in front of the Mirant Canal Station Power Plant on the Cape Cod Canal. Caller: John Sunda, SAIC. June 19, 2006a.

U.S. Army Corps of Engineers. Caldwell, Dave. Regulatory Contact. Telephone contact Report RE: General questions about dredging sediment from the area in front of the Mirant Canal Station Power Plant on the Cape Cod Canal. Caller: John Sunda, SAIC. June 16, 2006b.

Massachusetts Office of Coastal Zone Management (CZM). Truman Henson. Telephone contact Report RE: Questions about CZM consistency concurrences, permitting requirements and general questions about dredging sediment from the area in front of the Mirant Canal Station Power Plant on the Cape Cod Canal. Caller: John Sunda, SAIC. June 23, 2006.

Comment IX.D.2: Modifications to the screens and fish return, and requirement for continuous screen rotation

Mirant comments that:

> EPA proposes to require extensive changes to the intake screens and fish return, including:
>
> (1) retrofitting fish buckets to the current screens;
> (2) requiring continuous rotation of the screens;
> (3) installing a low pressure spray wash system which will (a) ensure that fish are never exposed to high pressure spray and (b) separate fish from debris, except for seaweed; and
> (4) retrofitting a bi-directional fish return, which will ensure that fish are returned to the Cape Cod Canal with no vertical drop and are transported away from the intake structures on the tide.

> The Fact Sheet suggests that EPA has incorrectly assumed that all of these changes to the existing intake structure are (1) technically feasible, (2) the most cost-effective means of reducing impingement and increasing survival of impinged fish, and (3) will be reasonably inexpensive. One or more of these assumptions is in error for each of these proposed requirements, however.

Response IX.D.2:

EPA has concluded based on the record that the changes to the intake screens and fish return, which are required by the Final Permit, are both technically feasible and affordable and are appropriate measures for minimizing adverse environmental impacts due to Canal's CWIS. In addition, EPA notes that Mirant does not identify any more cost effective means of achieving the same environmental performance. Also see responses to comments IX.D.3 – D.6.

Comment IX.D.3:

Mirant comments that:

> Moreover, to the extent EPA suggests it has based its conclusions on the Evaluation of Fish Protection Alternatives for the Canal Generating Station ("Alden Report") prepared by Alden Research Laboratory, Inc. ("Alden") and submitted by Mirant Canal with its 2003 Supplement to the Permit Renewal Application, we believe that EPA has overlooked critical caveats and information provided in that report.
>
> For example, as the Alden Report clearly stated with respect to the change in operation underlying all of the structural changes -- *i.e.*, switching to continuous rotation of the traveling screens -- making such a change would, in essence require replacement of the traveling screens themselves, because the existing screens lack the structural components necessary to withstand continuous rotation. *See* Alden Report, p. 3-3. As the Alden Report explains:
>
> > One option to improve impingement survival would be to upgrade the existing screens for continuous operation. However, extensive upgrades of moving parts are required to maintain the traveling screens for continuous operation. The costs associated with the upgrades to operate continuously are not substantially lower than the costs of retrofitting with Ristroph screens. In addition, the added costs of Ristroph screens are usually balanced by the increase in fish survival. Therefore, continuously operated screens were not evaluated further.
>
> *Id.*
>
> In short, as Alden explained, it simply is not possible, as EPA has assumed, to tack on fish buckets, a low pressure spray system, and a reconfigured fish return to the current system without also replacing many other significant structural components. To explain why, Alden Laboratory has prepared a brief report, which is Attachment A to these

comments. Because extensive structural changes would be required both to facilitate continuous rotation and, as the report explains, to accommodate reconfiguration of the fish return, the true capital cost of the retrofits EPA proposes is not the cost of the individual components, as EPA assumed. Instead, the true cost is more likely to approach or exceed the $2.4 million (plus $267,000 in operating and maintenance costs) associated with retrofitting coarse mesh Ristroph screens that EPA determined it could not reasonably require. *See* Alden Report, Tables 5-4 and 5-5, pp. 5-6 to 5-7; Fact Sheet, p. 43.

Response IX.D.3:

The Final Permit has been changed so that fish buckets are still required on the intake screens but no longer must they be installed on the existing screens. The Permittee may choose to either install Ristroph screens with fish buckets or retrofit the existing screens. The reasoning behind changing this requirement is explained below.

There are two options for upgrading an existing traveling screen system to one that is designed to return the fish to the source water body while minimizing injury to impinged fish; 1) retrofit and refurbish the existing traveling screens; or 2) replace the existing screens with new equipment. In determining whether to retrofit, an engineering general "rule-of-thumb" states that if retrofit costs are greater than 60% of the replacement costs, the existing screens should be replaced with new ones (USFilter, 2006b). Factors affecting retrofit costs include the design, material, age, and condition of the existing equipment. The equipment's condition will reflect the harshness of the environment, the degree of maintenance performed, and whether there is cathodic protection (USFilter 2006b).

One facility that successfully retrofitted an existing traveling screen system with fish buckets, low pressure spray, and a fish return system is the Salem Nuclear Power Plant in New Jersey (USFilter, 1999). In this case, the original Ristroph-type traveling screens were removed, shipped to the manufacturing facility, completely overhauled and upgraded to better than new condition. The retrofit included replacing the existing stainless steel screen baskets with light-weight, non-metallic screen baskets and replacing the single-speed drive units with two-speed units (USFilter, 1999). The Salem facility was able to retrofit as opposed to installing a new system since the existing screens were already of a Ristroph-type and, therefore, designed to accommodate a separate low pressure spray and fish return. The existing system was also designed to operate continuously. An appropriate maintenance program is also, of course, required.

A discussion with a USFilter representative confirmed that many of the traveling screen components cited as needing replacement in the Mirant Canal Alden Labs Report (Alden Research Laboratory, 2006) would be included in a typical conversion of a conventional traveling screen to one with fish handling and return capabilities (USFilter 2006a; USFilter 2006b). The exceptions to the items listed in the Alden Labs Report were that the screen frame most likely would not need to be strengthened (USFilter 2006a), and that the screen drive system may only require a gear box and motor replacement if single-speed operation is acceptable

(USFilter 2006b). The USFilter representative noted that adding two baskets and a section of screen frame is fairly easy to accomplish, but would require replacement of the cowling.

As stated in the Alden Report, additional spray water pumps would be needed, but the additional return water volume from the spray water pumps could help eliminate the need to augment the return flow with condenser effluent (see Comment IX.D.5 discussion below). However, this cost will be incurred regardless of whether the existing traveling screens are retrofitted or replaced.

The current condition and age of the existing traveling screens at Mirant Canal is not clear. However, a full replacement of the existing system may be reasonable and practical since 1) Units 1 and 2 began operation in 1968 and 1976, respectively, and unless the equipment has been replaced since then, the screens will be relatively old, and, 2) the existing screens were not designed to include Ristroph screen technology, which may make it more difficult to retrofit. In addition, the more components that must be upgraded or replaced, the more likely it is that a full replacement would make sense. As stated above, however, the Permittee may choose either to install Ristroph screens with fish buckets or to retrofit the existing screens.

It should also be noted that, contrary to the implication in Mirant's comment, the Alden Report stated that it was ruling out upgrading the traveling screens for continuous operation not because it was infeasible, but, as quoted in Mirant's comment, because using Ristroph screens achieved greater fish survival without substantial additional costs. Furthermore, EPA did not conclude that coarse mesh Ristroph screens were too expensive to be required but, rather, decided that the option should be dropped because it would not help reduce entrainment. *See* Fact Sheet at p. 43 and response to comment IX.E.3.

References

Alden Research Laboratory. Review of Proposed Section 316(b) Permit Requirements Draft National Pollution Discharge Elimination System Renewal Permit Number MA0004928 Mirant Canal Station. February 3, 2006.

USFilter. Application Note – "Meeting EPA "Fish Friendly" Requirements With USFilter Circulating Water Screens." WaterscreensCRLR1. 12/09/1999. Accessed at: http://www.usfilter.com/NR/rdonlyres/F2294F59-F2FB-4427-A4FD-7C7AC4EC3740/0/FishFriendlyCaseHistory.pdf

USFilter, Ken Decoursey. Telephone contact report Re: Questions about retrofitting conventional traveling screens to Ristroph screens. Caller: John Sunda, SAIC. August 21, 2006a.

USFilter, Rich Coniglio. Telephone contact report Re: Questions about retrofitting conventional traveling screens to Ristroph screens. Caller: John Sunda, SAIC. August 23, 2006b.

Comment IX.D.4:

Mirant comments that:

> In Attachment A, Alden also explains why it is neither technically feasible nor environmentally desirable to require separation of fish from debris, and why it is not possible to guarantee that impinged fish that are not removed by the low pressure spray will not be carried over to the back side of the screen well, where they will be exposed to the high pressure wash.

Response IX.D.4:

The Draft Permit does not prohibit combining the debris return and fish return troughs downstream of the traveling screen. These two streams are required initially to be generated separately to prevent the high pressure spray from injuring the fish. As long as there is sufficient flow volume to minimize fish injury in the return, the merging of these streams is acceptable. The vendor contacted was unaware of any data confirming detrimental effects to fish and aquatic life of combining the debris and fish return streams (USFilter 2006b).

EPA agrees that there is no guarantee that impinged fish that are not removed by the low pressure spray will not be carried over to the back side of the screen well and has added the word "most" for clarification in the following requirement: "The permittee shall ensure that a low pressure (<30 psi) screen spray wash is in operation as part of each screenwash system in a manner such that *most* organisms are not exposed to high pressure screen spray." EPA believes that experience with respect to the use of low pressure spray washes indicates that at least *most* of the fish will be removed by the low pressure spray wash.

USFilter, Rich Coniglio. Telephone contact report Re: Questions about retrofitting conventional traveling screens to Ristroph screens. Caller: John Sunda, SAIC. August 23, 2006b.

Comment IX.D.5:

Mirant comments that:

> With respect to the fish return requirements, Attachment A also explains why prohibiting a vertical drop from the fish return is not necessarily environmentally desirable.

Response IX.D.5:

At several other power generating facilities (Brayton Point Station and Salem Harbor Station) with fish return systems which drop fish to the water, EPA biologists have observed predation on returned fish by herring gulls. The return at Brayton Point Station is submerged on a hightide and birds were not observed around the fish return system during visits to that station that coincided with high tide. At lower stages of the tide, numerous gulls have been observed congregating by the outfall point, scooping up fish as they emerge. Furthermore, the free fall may cause disorientation which makes fish even more susceptible to opportunistic predation by gulls and other fish-eating birds. Thus, EPA believes to reduce mortality and safely return

impinged fish back to the marine environment, the fish return should return the fish directly to the water.

Comment IX.D.6:

Mirant comments that:

> Equally important, by exercising its BPJ to select technologies now, EPA is effectively foreclosing Mirant Canal from considering new and potentially more effective screening technologies, such as Geiger screens, which are even now being tested at Mirant Mid-Atlantic's Potomac River plant in Virginia. For a description of Geiger technology, see http://www.geiger-international.de/pdf/kettenumlauf_e.pdf; *see also* http://www.geiger-international.de/pages/prod_en/5_0_fishprotection.html. This study involving a collaboration between EPRI and Mirant Mid-Atlantic had not been commenced when Alden prepared its 2003 report. The preliminary results to date of the Geiger screen configuration (which, among other features, does not carry over to the condenser side), suggest that it may be highly effective in reducing impingement mortality for some species and life stages in an environment and under operating circumstances that appear fairly similar to the Canal Station's. Of course, the study would need to be completed and further analysis would need to be done before any conclusions could be drawn about the potential applicability of that technology to the Canal Station. Nevertheless, the technology appears to hold great promise. By requiring Mirant Canal to move forward with major intake structure modifications based on EPA's "BPJ" assessment, the Agency would wholly foreclose any potential for application of this technology, the incremental costs of which could not be justified.

Response IX.D.6:

To determine the requirements that meet the BTA standard for minimizing environmental impacts, EPA looks to the best information available at the time of permit issuance (see Response IX.B.1.1). The NPDES Permit Writers' Manual states that BPJ is the permit writer's "highest quality technical opinion" of the permit conditions required by the CWA, taking into account "all reasonably available and pertinent data and information." Mirant comments that in requiring a BTA determination with the Final Permit, EPA may eliminate other potentially effective technologies, including certain technologies currently under investigation.

EPA does not believe that permits should be held up because a technology could possibly be identified in the future that might be more effective. The possibility of future advances is always there and could be suggested as a reason for never issuing a new or reissued permit. This would not be an appropriate result under the Clean Water Act. If technological advances take place, they can, if feasible, be incorporated in future permits. Thus, the best technologies available may change over time and the statute recognizes that fact.

In the meantime, a new permit for Canal Station is overdue and EPA must make a BTA determination based on existing information to satisfy CWA § 316(b). EPA's decision is based on sound information regarding alternative technologies currently being used at multiple generating stations with proven success in reducing impingement and entrainment. With that

said, the Final Permit does not preclude the Permittee from installing Geiger screens as long as the technology 1) includes low pressure spray washing, 2) is equipped to transfer fish with minimal stress to a fish return trough, 3) is able to run on a continuous basis, and 4) is able to meet the performance standards of the permit. At present, however, Mirant's own comments indicate that further analysis would be needed to determine whether this technology would be applicable to Canal Station.

Comment IX.D.7: Moving chlorine injection point

Mirant comments that:

> Part I.A.13.d would require Mirant Canal to move the chlorine injection point to a point behind the screens, so as to avoid exposing impinged organisms to chlorinated water. Mirant Canal is concerned that this provision, in addition to being costly, [will] interfere with operation of the facility and compromise reliability by preventing adequate treatment of the circulating water pump house structure. Thus, we do not believe that this change should be required, subject to further study during the CDS.

Response IX.D.7:

Based on further analysis in response to this comment, EPA agrees with the thrust of the comment and has altered the permit condition consistent with Mirant's comment. In the text below, EPA explains its assessment and the specific changes made to the permit.

In freshwater systems, the problems associated with biofouling are primarily seen in the condensers, not in the pumphouses. Thus, for freshwater systems, chlorine injection only needs to be performed prior to the condensers and chlorine is often injected after the intake screens. However, in salt or brackish water systems, particularly marine environments, such as the Cape Cod Canal, it would be recommended that chlorine be injected ahead of the intake screens to help control mollusks, barnacles and sponges (Majka 2005). This practice helps reduce the need to physically clean the bar screens, traveling screens, and other components. No examples of saltwater intakes with chlorine injection downstream of the screens were identified.

Mirant's comment IV.C.1 notes that there is a lockout control that shuts off chlorination when the screens are operating and that if this practice was continued, then moving the chlorination injection point would not reduce the amount of chlorine in the fish return. Moving the injection point would only reduce chlorine exposure to fish impinged during the brief chlorine injection periods.

Given the difficulty involved in moving the injection points, EPA agrees to keep the chlorine injection points in their current locations as long as the exposure to impinged fish is minimized. To minimize exposure to chlorine the Final Permit requires that during chlorination, each screen shall:

1) be continuously rotated to reduce the amount of time impinged organisms are subjected to high levels of chlorine; and

2) either use an alternative water source that is not chlorinated for screen washing or dechlorinate the screen wash water (as performed at Pilgrim Station).

Majka, Jill. "Power Plants, Cooling Towers & Chlorination - Preventing Biofouling. Industrial Water World September 2005." Accessed at http://ww.pennnet.com/articles/article_display.cfm?article_id=240736

Comment IX.D.8: from Commonwealth of Massachusetts - Riverways Program

MA Riverways comments that:

> We support the new permit requirement for the relocation of the chlorine injection system. Removing the chlorination system from in front of the screens where impinged organisms would be further stressed, (or worse) by the chlorine is a necessary modification to reduce mortality. The elimination of the high pressure screen wash will also be beneficial. The operational changes in Outfall 002 to prohibit heated, chlorinated effluent discharges during screen washing operation is another needed step to reduce impacts to the marine biota of the receiving water.

Response IX.D.8:

As discussed above, EPA has been convinced that relocation of the chlorine injection system is not a reasonable requirement for the Canal Station Permit. However, the Final Permit will prohibit the discharge of heated and chlorinated condenser water into outfall 002 when the screen wash is in operation. In addition, the Draft and Final Permits prohibit condenser water discharge at outfall 002 during the chlorination of any Unit condensers (see Fact Sheet p.12-13). EPA feels these requirements are sufficient to minimize adverse impacts to aquatic organisms in the receiving waters to the extent practicable.

Comment IX.D.9: from Commonwealth of Massachusetts - Riverways Program

MA Riverways comments that:

> Modifications to the screens and fish return system are important improvements to help lessen to some degree the truly significant mortality caused by impingement. We wholly support a permit requirement to require the continual rotating of the intake screens when circulating pumps are in use and hope this modification can be accomplished effectively and quickly. As the Fact Sheet notes, there has been declines in most of the fish population in Massachusetts so it should be a priority to eliminate any preventable mortality for this facility. We would urge the regulators to work with fisheries managers to determine the acceptable levels of entrainment and impingement losses for this facility and provide the rationale used to arrive at the acceptable loss numbers. This information would allow the public to consider and respond to the goals set by the regulators and inform the Permittee of the targets for mortality reduction. Knowing the expected reduction will be invaluable information when further assessing the selected alternative.

Response IX.D.9:

Part I.A.13.a - f of the Final Permit identifies specific technology needed at Canal Station to reduce impingement mortality. In addition, Part I.A.13.g - h of the Final Permit requires Canal Station to reduce entrainment mortality to a level comparable to closed-cycle cooling. EPA believes that these technological improvements will meet the BTA standard for minimizing adverse environmental impacts as required by CWA § 316(b).

Section IX.E EPA's Evaluation of Closed-Cycle Cooling and Other CWIS Technologies

Comment IX.E.1:

Mirant comments that:

> For the reasons discussed above, the existence of the final Phase II Rule makes the alternatives analysis the Agency undertook unnecessary. Assuming for the sake of argument, however, that that were not the case, following are Mirant Canal's comments on EPA's alternatives analysis.
>
> We note at the outset that we agree with EPA that, based on the information available at this time, none of the technology alternatives EPA rejected would qualify as "BTA," nor would EPA have had any reasonable justification for requiring them.
>
> We also note that for none of these technologies had Mirant Canal performed the kind of detailed engineering, biological, and cost assessment necessary to select among options for purposes of the Phase II Rule, or to determine whether an alternative performance standard is appropriate for this site. Indeed, for many technologies that might be considered, pilot testing could prove necessary to adequately assess performance in this environment.

Response IX.E.1:

In light of the suspension of the Phase II Rule, Mirant's comments that the Rule rendered EPA's alternatives analysis unnecessary, or that the type of analysis required by the Rule had yet to be performed, are both moot. Even if the Phase II Rule were still in effect, however, EPA would disagree with these comments because, as explained in detail above, EPA's Draft Permit was developed on a BPJ basis consistent with the Rule. As a result, consideration of alternatives was appropriate and the level of analysis that was undertaken was sufficient to support the derivation of the limits in the Draft and Final Permits.

With regard to Mirant's comments on EPA's alternatives analysis, the company appears to mischaracterize EPA's assessment. EPA did <u>not</u> conclude, as stated by Mirant, "that, based on the information available at this time, none of the technology alternatives EPA rejected would

qualify as 'BTA' . . . ." To begin with, EPA plainly specified technology-based limits to satisfy the BTA standard for reducing impingement mortality. In addition, with regard to entrainment reduction, EPA discussed several technologies and concluded that closed-cycle cooling would qualify as the BTA. At the same time, however, EPA also concluded that under the Phase II Rule, the applicable legal requirements *might possibly* also be satisfied at much less expense through the use of certain screening technologies (and/or restoration measures). As a result, EPA concluded that further analysis was needed to determine what should be required for entrainment reduction under the Phase II Rule.

As quoted above, *see* Response IX.A.3, EPA stated the following in the Fact Sheet:

> . . . permit limits based on the installation of Alternative 6 [(*i.e.,* closed-cycle cooling)], which would yield the largest entrainment and impingement mortality reduction of the six alternatives, would satisfy CWA § 316(b)'s BTA requirements, see 40 C.F.R. § 125.94(a)(1)(i), and that Alternative 6 remains open to Canal Station as a potential means of compliance.

Fact Sheet at 44. EPA also found that fine-mesh screens and wedgewire screens would yield entrainment reduction benefits, albeit lesser benefits, but that additional study was needed to characterize the full extent of those benefits and, for wedgewire screens, to resolve any implementation practicability issues. *See* Response IX.A.3. In the end, with regard to entrainment reduction, EPA included in the Draft Permit only the information submission requirements from the Phase II Rule (and the requirement that the ultimately selected BTA requirements be implemented) not because nothing qualified as the BTA, but because EPA believed that in reasonably exercising its BPJ under the Phase II Rule, it should for equitable reasons not require closed-cycle cooling when much less expensive requirements might potentially be authorized under the then-effective Phase II Rule once it could be fully applied to Canal Station. Indeed, the Rule allowed under certain circumstances for less stringent, site-specific performance standards and/or restoration projects to satisfy CWA § 316(b). Thus, as explained above, EPA's application of BPJ under the Phase II Rule was informed by the substantive terms of the Rule. *See* Response IX.A.3. While EPA did not select a particular technology to minimize entrainment in the Draft Permit, it did require the implementation of the BTA ultimately selected for minimizing entrainment.

It should also be noted again that while the Final Permit is based on closed-cycle cooling as the BTA, it does not preclude the use of other technologies if it is determined that they can meet the permit's performance standards. Thus, both the Draft and Final Permit reflect that more than one technology may be able to meet the permit's performance standards for the minimization of entrainment.

Mirant also comments that the type of "detailed engineering, biological, and cost assessment necessary to select among options for purposes of the Phase II Rule" was not conducted. As stated above, this comment is moot as it pertains to the Phase II Rule. Putting the Rule aside, EPA has explained above that the level of engineering, cost, and biological analysis undertaken in support of the permit was adequate for the Draft Permit and is adequate for the Final Permit. *See* Response IX.B.1.3. Obviously, the Permittee will engage in more detailed engineering work

and cost evaluation as it moves forward to comply with the permit. Also, consistent with Parts I.A.13.g and h of the Final Permit, the Permittee may implement an alternative to closed-cycle cooling that satisfies the permit or, if it believes it appropriate, seek a permit modification.

Above in Response IX.A.6, EPA addresses, among other things, a variety of technical concerns mentioned by Mirant with regard to closed-cycle cooling. Finally, with respect to Mirant's comment that pilot testing might be needed, EPA does not believe that this is the case with regard to closed-cycle cooling as the capabilities of the technology are well understood.

Comment IX.E.2: Retrofit Intake with Submerged, Cylindrical Wedge Wire Screens

Mirant comments that:

> Based on information provided by the Army Corps of Engineers (Corps), EPA concludes:
>
> > EPA does not at this time designate this as BTA for Canal Station's NPDES. However, if the engineering issues were resolved, and depending on the results of further evaluation of the entrainment and impingement impact reduction benefits of the technology, EPA believes that permit limits based on the installation of Alternative 2 [cylindrical wedge wire screens] might be able to satisfy CWA § 316(b)'s BTA requirements and that this Alternative should continue to be considered in future analyses as a potential means of compliance.
>
> Fact Sheet, p. 43.
>
> This statement suggests that EPA believes the serious navigation, ice damage, dredging, and noise issues presented by this alternative can somehow be resolved, and tends to minimize the concerns expressed by the Corps, whose permitting authority over navigable waters gives it an absolute veto over projects of this kind. Although Mirant Canal would not wholly foreclose further analysis of this alternative, it does not believe that these issues can be treated so casually.

Response IX.E.2:

By no interpretation is EPA taking any of the above issues related to wedgewire screens lightly. Indeed, these issues were part of the reason EPA did not identify this technology as the BTA (in addition to the need there would be to further characterize the technology's environmental performance). This does not mean, however, that further, more detailed discussions between the Permittee and the Corps might not be worthwhile to determine whether the engineering/navigational issues could be resolved. EPA is not aware that such detailed discussions have taken place. At the same time, EPA is not requiring Mirant to explore this option further if it does not deem it worthwhile or if it concludes that wedgewire screens do not meet the performance requirements of Part I.A.13.g.ii.

Comment IX.E.3: Install Coarse Mesh Ristroph Screens

Mirant comments that:

> EPA similarly rules out coarse mesh Ristroph screens since they do not reduce entrainment and will cost $2.4 million. As we note above, Mirant Canal agrees that this cost is excessive for this site. We also note above, however, that the requirements EPA has proposed are likely to cost at least as much, if not more.

Response IX.E.3:

EPA eliminated coarse mesh Ristroph screens because they are not designed to minimize entrainment, not because they are not affordable or because the cost is otherwise excessive. *See* Canal Fact Sheet, page 43. On the contrary, EPA feels that the cost of this technology, as assessed in Part 5.2.3 of the Fact Sheet, could be reasonably borne by the Permittee. Furthermore, Part I.A.13.g.iii of the Final Permit provides that if an entrainment reduction alternative is used under Part I.A.13.g.i and ii that will reduce impingement mortality as much as the steps required by Parts I.A.13 a through f, then the Permittee can seek a permit modification to remove the superfluous permit conditions.

Comment IX.E.4 from Commonwealth of Massachusetts - Division of Marine Fisheries

MA DMF comments that:

> Section 5.3 of the Fact Sheet provides technological options for entrainment reduction required under section 316(b) of the Clean Water Act, and indicates EPA may give further consideration to alternative 1 (expand intake and install fine mesh Ristroph screens), 2 (retrofit intake with submerged, cylindrical wedge wire screens), and 6 (retrofit plant with closed-cycle cooling system). Alternative 1 may reduce entrainment of some but not all fishery species, and alternatives 1 and 2 will cause mortality to fish eggs and larvae from impingement on the screen surfaces. Therefore *MarineFisheries* supports EPA alternative 6 to retrofit the plant with a closed-cycle cooling system. Further evaluation of available technological and/or operational measures is dependent on the Proposal for Information Collection and the Comprehensive Demonstration Study that will be submitted to EPA. MA DMF supports closed-cycle cooling.

Response IX.E.4: This comment is noted above in Comment IX.A.2, and considered and responded to in Response IX.A.

Section IX.F Other Cooling Water Intake Structure Requirements

Comment IX.F.1: Requirement for Return of Live Organisms and Provisions for Return of Debris

Mirant comments that:

> If EPA, over Mirant Canal's serious objections, proceeds with its proposal requiring the Canal Station to make numerous structural and other changes to the CWIS, the Agency should recognize that those requirements make this provision wholly superfluous. Thus, it should be deleted. If, as Mirant Canal requests, EPA deletes those provisions, Mirant Canal has no objection to this provision.

Response IX.F.1:

Mirant fails to explain why this provision is superfluous and it does not appear so to EPA. The fish return system requirements are designed to reduce impingement mortality by maximizing the return of individual fish to their native habitat with minimal stress. The need for these requirements depends on the type of technology used at the facility and its potential to kill fish by impingement. For a technology (such as, for example, wedgewire screens) that is designed to eliminate impingement, a new fish return system would not likely be necessary. For technologies that would impinge fish (e.g., modified Ristroph screens), an effective fish return system is needed to satisfy BTA requirements. In addition, while water withdrawals and the resulting entrainment and impingement will be vastly reduced through the use of closed-cycle cooling, the withdrawal of makeup water will still be expected to result in impingement of fish and an effective fish return system would still be needed. Part I.A.13.g.iii of the Final Permit will, however, allow Mirant to seek the removal of permit conditions that it believes have been rendered superfluous by other conditions in the Final Permit.

Comment IX.F.2: Massachusetts' Authority to Impose More Stringent Requirements for CWIS

Mirant comments that:

> At pp. 28-29 of the Fact Sheet, EPA explains state Water Quality Standards also may apply to the development of permit conditions for cooling water intake structures. It goes on to say that "[I]n this case, Massachusetts Water Quality Standards apply and the Commonwealth has in the past confirmed that its Water Quality Standards, as well as other state law requirements, do, in fact, apply to regulating the adverse environmental effects of cooling water intake structures. Thus, the Draft Permit's limits under CWA § 316(b) must also be sufficiently stringent not to cause or contribute to a violation of Massachusetts Water Quality Standards, including designated uses and narrative criteria." *Id.* p. 28.

> Mirant Canal does not believe that Massachusetts DEP has any applicable laws that govern the Canal Station CWIS. Thus, DEP has no law to apply to the CWIS via § 401 certification. Even if that were not the case, however, that is not the end of the inquiry. Even if Massachusetts could show that its water quality standards law, for example, could be interpreted so broadly as to give it authority to regulate CWIS (as EPA implies), the Commonwealth also must show that it has an applicable standard, that that standard applies to the CWIS, and that the technology requirements are insufficient to assure

> attainment of the standard. *See* § 125.94(f), 69 Fed. Reg. 41,687; *compare* 40 C.F.R. § 122.44(d)(1)(vi). Mirant Canal submits that no such standard exists, nor could such a showing be made, even if EPA were not to require the intake structure modifications it has proposed.

Response IX.F.2:

It is clear that CWA § 301(b)(1)(C) requires EPA to ensure that cooling water withdrawals by Canal Station are consistent with Massachusetts' water quality standards, and that CWA § 401(a)(1) and (d) require that EPA's permit satisfy any state certification conditions which may be identified by the state in light of the fact that the overall "activity" associated with a discharge must not violate any applicable water quality standards. *PUD No. 1 of Jefferson County v. Washington Dep't of Ecology*, 511 U.S. 700, 711–12 (1994). This has recently been reaffirmed by EPA in *In re: Dominion Energy Brayton Point L.L.C.*, 12 E.A.D. 490, at 619 n. 205 and 627-28 (Feb. 1, 2006). *See also* 40 C.F.R. §§ 125.80(d), 125.84(e), 125.90(d) and 125.94(e); *Riverkeeper v. EPA*, 358 F.3d 174, 200–02 (2nd Cir. 2004).

MassDEP has previously explained how it derives the appropriate regulatory standard from its water quality standards to use in developing requirements for cooling water intakes. *See* Massachusetts Water Quality Certification (WQC) for NPDES Permit MA 0004898 (Mirant Kendall Station, Cambridge, MA). Under the state's water quality standard regulations

> [e]ach class is identified by the most sensitive, and therefore governing, water uses to be achieved and protected. Surface waters may be suitable for other beneficial uses, but shall be regulated by the Department to protect and enhance the designated uses.

314 CMR 4.05(1). Thus the state's water quality standards include designated uses which must be protected in a NPDES permit, or correspondingly, in any state certification the Department makes under CWA § 401.

In water quality certification letters issued under CWA § 401(a)(1), MassDEP has reiterated the above position that its water quality standards may be applied to govern CWIS limits in EPA-issued NPDES permits. *See* Massachusetts WQC for NPDES Permit MA 0004898 (Mirant Kendall Station, Cambridge, MA), dated September 13, 2006. Furthermore, through revisions to its water quality standards, MassDEP has recently reaffirmed its authority to condition CWISs to assure compliance of the WQS. *See* http://www.mass.gov/dep/water/laws/wqssum.htm (describing the newly adopted revision to the state water quality standards governing Class SB waters, which *affirms and clarifies* DEP's authority by adding the following language: "the Department has the authority under 33 U.S.C. § 1251 (FWPCA § 401), M.G.L. c. 21, §§ 26 through 53 and 314 C.M.R. 3.00 to condition the CWIS to assure compliance of the withdrawal activity with 314 C.M.R. 4.00, including, but not limited to, compliance with narrative and numerical criteria and protection of existing and designated uses." 314 C.M.R. 4.05(4)(b)(2)(d)). EPA sees no reasonable basis for disregarding MassDEP's considered interpretation of the scope of its authority under Massachusetts law to regulate or condition the operation of a cooling water intake structure.

Canal Station withdraws water for its cooling system from the Cape Cod Canal. These waters have been classified as "SB" by the state and, as such, the designated uses for these waters include providing a "healthful" and "at least somewhat high quality habitat" for fish and other aquatic life, as well as a resource for primary and secondary contact recreation (which includes fishing). *See, e.g.,* Massachusetts WQC for NPDES Permit MA 0004898 (Mirant Kendall Station, Cambridge, MA), dated September 13, 2006, page 8 n. 8. Though the standard for Class SB waters does not include any specific numerical criteria that apply directly to cooling water intakes, it is nevertheless clear that MassDEP must impose the conditions it concludes are necessary to protect the designated uses for the Cape Cod Canal and ensure that it remains a healthful, somewhat high quality "habitat for fish [and] other aquatic life."

The MassDEP has primary responsibility for determining what permit limits are necessary to achieve compliance with state law requirements, and the EPA-issued permit must address any conditions the state includes in its 401 certification to protect water quality. See 33 U.S.C. §§ 1341(a)(1) and (d). However, under CWA § 301(b)(1)(C) EPA must also make an independent determination that the permit's limits are adequate to protect state WQS, including designated uses and narrative criteria, even if the state does not include any conditions in its certification. Thus the permit's limits under CWA § 316(b) should ensure that cooling water intake operations do not cause or contribute to a failure to attain the source water body's designated uses.

The commenter is mistaken if it is asserting that Massachusetts' WQS must state specific numeric cooling water withdrawal restrictions in order to assert Section 401 certification authority over those withdrawals. The Supreme Court has held that Section 401 may be invoked to protect designated uses. *PUD No. 1*, 511 U.S. at 723 (upholding state certification conditions to protect designated use of fish habitat); see also id. at 714–718 (rejecting arguments that a state may only require compliance with specific criteria). Thus protecting the designated uses in the receiving waters is an appropriate basis for intake limits under Section 401, even if cooling water withdrawals were not explicitly mentioned in the Massachusetts WQS. Again, EPA's Environmental Appeals Board recently confirmed that cooling water intakes may be regulated to protect designated uses. Dominion at 186–188.

Mirant also comments that before a state could add additional water quality-based intake requirements, it would have to show that the technology-based intake requirements were not adequate to satisfy the state's water quality standards. The comment is not applicable here, however, as the Final Permit's limits are technology-based, as derived from EPA's site-specific determination of the BTA under CWA § 316(b). *See* Fact Sheet at 24–59. EPA concludes that the Final Permit's limits will satisfy the state's applicable water quality standards and expects that the state's WQC will confirm this. Therefore, we do not anticipate the permit's limits being made more stringent on the basis of state water quality standards.

Comment IX.F.3:

Mirant comments that:

> EPA also suggests in its discussion of this issue that the United States Supreme Court, in its decision in *PUD No. 1 of Jefferson County v. Washington Dep't of Ecology*, 511 U.S. 700, 711-12 (2000), has construed § 401 of the CWA so as to create state regulatory authorities that far exceed EPA's authority to impose under the Clean Water Act itself. This is not the case. Although § 401(d) may indeed, as the Court held, be read to authorize additional conditions or limitations on the activity to the extent the activity is subject to regulation by the federal agency in question, that is not the case where the federal agency's jurisdiction is itself limited to the discharge.

Response IX.F.3:

This comment is inapplicable to the permit proceeding at hand. There is no question in this case that EPA has regulatory authority over Canal Station's pollutant discharges and, under CWA § 316(b), its cooling water withdrawals. Please see also Response IX.F.2 above.

Comment IX.F.4:

Mirant comments that:

> Finally, Part I.A.15.a of the Draft Permit provides generally that "Discharges and water withdrawals" shall not impair any Class SB use of the Canal and shall not violate any applicable narrative criteria from the state water quality standards, etc. Mirant Canal does not object to Part I.A.15.a to the extent that it concerns discharges. However, for the reasons discussed above, EPA and DEP do not have authority to regulate Mirant Canal's water withdrawals under the Mass. Water Quality Standards because those standards do not contain any standards applicable to water withdrawals.

Response IX.F.4: Please see Response IX.F.2 above.