HUNTON
WILLIAMS

HUNTON & WILLIAMS LLP
1900 K STREET, N.W.
WASHINGTON, D.C. 20006-1109

TEL 202 • 955 • 1500
FAX 202 • 778 • 2201

KRISTY A. N. BULLEIT
DIRECT DIAL: 202-955-1547
EMAIL: kbulleit@hunton.com

FILE NO: 58182.000002

February 2, 2009

By Hand

Eurika Durr, Clerk of the Board
U.S. Environmental Protection Agency
Environmental Appeals Board
Colorado Building
1341 G Street, N.W., Suite 600
Washington, DC 20005

Re: Mirant Kendall, LLC, NPDES Permit No. MA 0004898

Dear Ms. Durr:

I have enclosed the original plus five copies of Mirant Kendall, LLC's Petition for Review of Modified Permit and associated exhibits for filing with the Board. As you likely are aware, there are two active dockets before the Board related to NPDES Permit No. MA 0004898, as issued to Mirant Kendall, LLC by the United States Environmental Protection Agency ("EPA") on September 26, 2006, NPDES 06-12 and NPDES 06-13. At the Board's direction, this petition is not being filed as part of those existing active dockets.

Please note that while Mirant Kendall is not required to serve this petition on the permitting agency, EPA, a courtesy copy has been sent by first-class mail to Ronald A. Fein, Esq. at EPA-Region 1.

Please do not hesitate to contact me with any questions about this matter. Thank you for your attention.

Best regards,

Kristy A. N. Bulleit

cc: Ronald A. Fein, Esq.

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

In re: Mirant Kendall, LLC **Mirant Kendall Station**	)	**NPDES ____**
NPDES Permit No. MA0004898	)	

MIRANT KENDALL LLC'S PETITION FOR REVIEW OF MODIFIED PERMIT

MINTZ LEVIN COHN FERRIS
GLOVSKY & POPEO, P.C.
Ralph A. Child
Breton Leone-Quick
Colin G. Van Dyke
One Financial Center
Boston, MA 02111
(617) 542-6000
(617) 542-2241 fax

HUNTON & WILLIAMS LLP
Kristy A. Bulleit
1900 K Street, N.W.
Washington, D.C. 20006-1109
(202) 955-1547
(202) 778-2201 fax

Counsel for Petitioner Mirant Kendall, LLC

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I. INTRODUCTION

Mirant Kendall, LLC ("Mirant Kendall"), petitions for review of a Modification of NPDES Permit No. MA0004898 ("Modified Permit") issued by EPA Region 1 for the Kendall Cogeneration Station on the Charles River in Cambridge, Massachusetts, attached hereto as Exhibit 1.[1/] Region 1 (the "Region") has committed numerous clear errors of law, fact, science, discretion, and policy in issuing the Modified Permit, as shown below.

This is the third petition that Mirant Kendall has filed to seek review of NPDES Permit No. MA0004898. Mirant Kendall's original petition to this Board was filed on October 30, 2006, and addressed a final permit issued by the Region on September 26, 2006 ("2006 Final Permit"). That appeal was docketed as In re: Mirant Kendall, LLC, NPDES 06-12. Because of the extremely complex issues and substantial record (primarily concerning Kendall Cogeneration Station's thermal discharge), and with the assent of the Region and by permission of this Board, Mirant Kendall filed a supplemental petition in NPDES No. 06-12 on December 18, 2006 ("Supplemental Petition").

As this Board is aware, and as is summarized in more detail below, the Region then withdrew certain provisions of the 2006 Final Permit on July 25, 2007 pursuant to 40 C.F.R. § 124.19(d). Provisions that were not withdrawn remained subject to Mirant Kendall's pending petition. Since these provisions were withdrawn, this Board has stayed all further proceedings in NPDES No. 06-12. The parties' next status report is due by February 27, 2009.

On December 19, 2008, the Region issued the Modified Permit that is the subject of this petition. Specifically, this petition constitutes a request for review of the provisions contained in the Modified Permit that are identified in Exhibit 2 attached hereto.

A. Background

The following background section provides a discussion of the portions of the permitting process most relevant to the arguments presented in this petition. For a complete summary of the permitting process for NPDES Permit No. MA0004898 through the issuance of the 2006 Final Permit, see Mirant Kendall's Supplemental Petition in NPDES No. 06-12.

1. 2004 Issuance of the Draft NPDES Renewal Permit

On June 14, 2004, the Region issued a draft renewal of NPDES Permit No. MA0004898 ("2004 Draft Permit").[2/] Pursuant to § 316(b) of the Clean Water Act, the Region developed provisions in the 2004 Draft Permit reflecting its site-specific best professional judgment ("BPJ") as to what constituted the best technology available ("BTA") for reducing impingement mortality and entrainment ("IME") at Kendall Cogeneration Station. While the Region relied upon some of the provisions in EPA's then-proposed Phase II Rule (which was intended to apply to intake technologies at existing facilities such as Kendall Cogeneration Station), the 2004 Draft Permit proposed installation of a fine-mesh barrier net. The 2004 Draft Permit also included a number of design specifications for the fine-mesh barrier net, including a requirement that the velocity through the net not exceed a 0.5 fps, and a requirement that the net consist of separate panels that could be removed individually for cleaning or maintenance. The

2004 Draft Permit also required Mirant Kendall to develop and apply some unspecified mechanism to free impinged eggs and larvae in a manner that would maximize their survival.

The 2004 Draft Permit did not propose any specific mesh-size for the net, but it did set performance standards for reducing impingement and entrainment. Specifically, the 2004 Draft Permit proposed an 80% reduction in impingement mortality and a 60% reduction in entrainment, as compared against an undefined baseline.

On October 15, 2004, Mirant Kendall submitted timely comments on the 2004 Draft Permit that addressed, among other things, the permit's impingement and entrainment reduction provisions.[3/]

2. 2006 Issuance of the NPDES Renewal Permit

On September 26, 2006, the Region issued a final renewal of NPDES Permit No. MA0004898 ("2006 Final Permit").[4/] By the time the 2006 Final Permit was issued, EPA's Phase II Rule had come into effect; however, the 2006 Final Permit still reflected the Region's BPJ as to BTA with minimal reliance on the Phase II Rule.

The impingement and entrainment reduction provisions in the 2006 Final Permit were very similar to those contained in the 2004 Draft Permit, but the rationale for the entrainment-related requirements changed. Instead of imposing entrainment reduction provisions based on § 316(b), the 2006 Final Permit based its entrainment-related requirements on the Water Quality Certification issued by MassDEP on September 13, 2006 (the "MassDEP WQC") pursuant to § 401 of the Clean Water Act. The MassDEP WQC claimed that it could not certify the 2006 Final Permit absent entrainment-

reduction provisions because such provisions were necessary to achieve compliance with the Massachusetts Water Quality Standards ("WQS").[5/]

3. Mirant Kendall's Petition for Review and Supplemental Petition

On October 30, 2006, Mirant Kendall filed a timely petition for review of the 2006 Final Permit. Mirant Kendall and the Region concurrently filed a joint scheduling motion that this Board granted by order dated November 22, 2006. By that order this Board granted leave for Mirant Kendall to file the Supplemental Petition, which Mirant Kendall did on December 18, 2006. On October 30, 2006, the Conservation Law Foundation of New England, Inc. ("CLF") and the Charles River Watershed Association ("CRWA") also filed a timely initial petition with the Board for review of the 2006 Final Permit that was docketed as NPDES 06-13, and by the order of the Board, they were granted leave to file a supplemental petition. On December 14, 2006, CLF and CWRA filed their supplemental petition for the 2004 Final Permit.

Mirant Kendall also filed two administrative appeals that are currently pending at MassDEP's Office of Appeals and Dispute Resolution. First, on October 4, 2006, it filed a timely claim (MassDEP Docket No. 06-156) for an adjudicatory hearing on the MassDEP WQC. Second, on October 26, 2006 Mirant Kendall filed a timely claim (MassDEP Docket No. 06-165) for an adjudicatory hearing on the 2006 Final Permit to the extent that it also constituted a surface water discharge permit ("SWDP") under state law.

By operation of MassDEP's regulation at 310 C.M.R. 1.01(6)(h), the appeal in MassDEP Docket No. 06-165 currently is stayed pending resolution of Mirant Kendall's

petition to this Board. On January 31, 2007, the MassDEP hearing officer issued an order staying the appeal of the WQC pending resolution of the proceedings before this Board.

4. Riverkeeper II Decision; Suspension of the Phase II Rule; Withdrawal of Certain Permit Provisions

On July 9, 2007, while Mirant Kendall's appeal to this Board on the 2006 Final Permit was still pending, EPA revoked its Phase II Rule as a result of the decision in Riverkeeper, Inc. v. EPA.[6/] The United States Supreme Court subsequently agreed to review aspects of that decision, and, as of the present date, oral argument has been completed and a decision is pending.[7/]

Because the technology-based impingement reduction provisions in the 2006 Final Permit were based -- to some extent -- upon the Phase II Rule, and because the Region's decision not to include any technology-based entrainment reduction provisions under § 316(b) in the 2006 Final Permit was influenced by the Phase II Rule, the Region submitted a motion to this Board on July 25, 2007 indicating that it planned to withdraw certain portions of the 2004 Final Permit. That motion also sought a stay of the proceedings to allow the Region the opportunity to re-issue a permit with new provisions in place of those that were withdrawn.

Mirant Kendall generally supported the Region's motion, albeit with qualifications. This Board granted the Region's motion for a stay. Since issuing that initial stay, this Board has issued a series of additional stays, and the proceedings in NPDES No. 06-12 are now stayed until March 6, 2009.

5. The Draft Permit Modification

On March 10, 2008, the Region issued its Draft Permit Modification for NPDES Permit No. 0004898 ("Draft Permit Modification"), along with a Statement of Basis

document ("SOB").[8/] The Draft Permit Modification contained revised impingement and entrainment reduction provisions based on a new, site-specific BPJ determination independent of the suspended Phase II Rule. Specifically, the Draft Permit Modification proposed the following to be BTA:

- A "primary BTA" consisting of an unidentified "aquatic organism exclusion technology," meeting the following design standards:
    - an opening size of no greater than 0.5 mm;
    - through-media velocity restricted to 0.5 fps (or less) at every point at all times;
    - impinged eggs and larvae must be "gently released" from the exclusion technology in a manner that maximizes the probability of their survival;
    - an induced sweeping velocity past the face of the exclusion technology greater than the through-screen velocity and sufficient to carry away eggs and larvae to a location that minimizes re-impingement;
    - installed in the Lower Basin or Broad Canal; and
    - deployed annually no later than March 1 and until at least August 31.
- A "secondary BTA" consisting of a coarse-mesh barrier net that would be deployed when the primary BTA was not in operation, and satisfying the following design standards:
    - ¼ inch pore size;
    - through-media velocity restricted to 0.5 fps (or less) at every point at all times; and
    - deployed in front of each of the three intakes, except when icing conditions preclude deployment.
- A "tertiary BTA" consisting of the existing traveling screens that would be operated whenever neither the primary nor secondary BTA were deployed or functioning.

On May 1, 2008, Mirant Kendall provided timely comments on the Draft Permit Modification.[9/]

6. Modified Permit

On December 19, 2008, the Region issued the Modified Permit, along with a Response to Comments document ("RTC"), which attempted to address Mirant Kendall's and others' comments on the Draft Permit Modification.[10/] The Modified Permit's impingement and entrainment provisions are substantially similar to those in the Draft Permit Modification:

- A "primary BTA" consisting of an unidentified "aquatic organism exclusion technology," meeting the following design standards:
    - an opening size of no greater than 0.5 mm;
    - through-media velocity restricted to 0.5 fps (or less) at all points, to the extent practicable;
    - an air-burst or backwash technology that must be used to clear the technology of debris and impinged organisms;
    - an induced sweeping velocity past the face of the exclusion technology greater than the approach velocity as measured 6 to 8 inches from the screen;
    - installed in the Broad Canal; and
    - deployed annually no later than March 1 (unless icing conditions prohibit it) and until at least August 31.
- A "secondary BTA" consisting of a coarse-mesh barrier net that would be deployed when the primary BTA was not in operation, and satisfying the following design standards:
    - ¼ inch pore size;
    - through-media velocity restricted to 0.5 fps (or less) at all points to the extent practicable; and
    - deployed in front of each of the three intakes, except when icing conditions preclude deployment

- A "tertiary BTA" consisting of the existing traveling screens that would be operated whenever neither the primary nor secondary BTA were deployed or functioning.

- Kendall Cogeneration Station must, to the extent practicable, schedule its periodic maintenance outages from May 15 to June 30.

In addition to the new requirement for scheduled outages, the primary differences between the Draft Permit Modification and the Modified Permit are that the Modified Permit no longer would require the "gentle release" of impinged organisms, mandates placement of the primary BTA in the Broad Canal, and does not require deployment of the primary BTA when icing conditions make it impractical.

Finally, the Modified Permit includes a largely identical -- in terms of scope and breadth -- biological sampling and monitoring program as was proposed in the Draft Permit Modification.

7. MassDEP's New WQC and SWDP

Just prior to issuance of the Modified Permit, MassDEP issued a WQC for the Modified Permit on November 25, 2008.[11/] Unlike the WQC on the 2006 Final Permit, this one only certifies that the Modified Permit will meet the Massachusetts WQS, and does not include any separate requirements. On January 9, 2009, Mirant Kendall appealed this WQC to MassDEP's Office of Appeals and Dispute Resolution.

The Modified Permit also served as MassDEP's SWDP, just as the 2006 Final Permit also constituted a SWDP under Massachusetts law. On January 20, 2009, Mirant Kendall appealed this SWDP to MassDEP's Office of Appeals and Dispute Resolution.

B. Reservations Regarding Replies, Briefing, and Oral Argument

Mirant Kendall reserves all rights to seek this Board's leave to reply to the Region's forthcoming response to this petition, as well as any response filed by CLF and

CRWA. Mirant Kendall also reserves all rights to seek the Board's leave to respond to any petitions filed by CLF and CRWA, or any other person.

Mirant Kendall also reserves the right to seek to file briefs or motions regarding any issue, as necessary, and to present oral argument.

Finally, given that the Region has not responded to Mirant Kendall's original or Supplemental Petition in NPDES No. 06-12 that were filed over two years ago, Mirant Kendall also reserves the right to seek leave to file a reply to the Region's responses to those filings.

II. EXECUTIVE SUMMARY

The Modified Permit requires the design, implementation, and operation of a three-tiered suite of cooling water intake technologies, many components of which have never been studied or tested, let alone implemented, at a power generating station or comparable facility. The Region has taken this experimental approach despite the already minimal impingement mortality and entrainment at Kendall Cogeneration Station and without presenting any concrete evidence or study results that its novel requirements could actually bring any improvements to the eco-system within the Lower Basin of the Charles River. For those reasons and others adduced in this petition, the Modified Permit does not correctly or adequately exercise EPA's authority to conduct a site-specific BPJ determination of the BTA for the Station's existing cooling water intake structures ("CWIS") under § 316(b) of the Clean Water Act.

As Mirant Kendall demonstrates below, the Board should review the Region's approach and remand the Modified Permit with instructions to correct the following specific errors:

- The Region has conducted several critical analyses forming the backbone of its best professional judgment under § 316(b) as to the BTA (such as whether certain technologies it has required are actually "available"). It conducted those analyses only after the close of the public comment period and without providing Mirant Kendall or others the opportunity to comment on these central analyses.

- The Region has misconstrued its authority under § 316(b) with respect to its ability to consider costs and benefit. That misconstruction is especially material here where the record demonstrates that the benefits -- if any -- expected from some of the experimental technologies would be minimal.

- The Region has erred in concluding that impacts from impingement mortality are more than de minimis, and has not adequately assessed the site-specific data and information indicating that many of the already low numbers of fish

impinged at Kendall Cogeneration Station's intakes are already dead or in the process of dying, independent of Mirant Kendall's operations.

- The Region has erred in concluding that impacts from entrainment are more than de minimis, without adequately assessing the theory as a result of Kendall Cogeneration Station being located so close to where eggs and larvae are advected from the system. As a result of this location, a substantial majority of the organisms entrained at Kendall Cogeneration Station would suffer certain mortality even absent entrainment.

- The Region's selection of BTA does not satisfy EPA's own criteria for determining whether a technology is available, which requires -- at a minimum -- that the technology must have been deployed in an analogous setting or has been subjected to sufficient study or testing to provide a basis for believing it will be feasible and effective. The Region's application of § 316(b) here is contrary to the plain language of the statute, and impermissibly expands the Region's discretion.

- The record cannot support a conclusion that the Region's selection of BTA will minimize any adverse impacts. In fact, the record demonstrates the contrary, that the BTA could increase adverse impacts by entraining more eggs and very small larvae than are presently entrained, and by altering flows in the Lower Basin in a manner that the Region has already determined could pose risks to the water quality in the Lower Basin.

For these reasons, and those set forth below, the Region has acted arbitrarily and capriciously issuing the Modified Permit.

The Region's approach here is especially unwarranted at a time when the applicable law under § 316(b) is in flux. But regardless of how the United States Supreme Court decides the Riverkeeper II appeal, and regardless of what EPA's new Phase II Rule will require, the Region's approach here does not constitute a proper site-specific BPJ determination of BTA under § 316(b). Moreover, the Region's disregard for the very real possibility that the Modified Permit will cause more harm than good is inconsistent with its other efforts to improve the water quality in the Lower Basin of the Charles River.

III. THE BOARD'S POWER OF REVIEW

The Board's powers to review the Region's determinations arise under 40 C.F.R. § 124.19(a) and are well-settled. Mirant Kendall recognizes that it must demonstrate that the Region's decisions involve clearly erroneous findings of fact or conclusions of law, or involve important policy considerations that the Board should review in its discretion. Mirant Kendall fully acknowledges the Board's expectation that it should exercise its powers of review "sparingly," and with deference to the Region's technical determinations.

The issues presented for review in this matter easily compel the Board's exercise of its powers of review here for the reasons discussed in detail below.

IV. ISSUES FOR REVIEW

A. Failure to Re-Open the Public Comment Period

As a preliminary matter, and separate and apart from the Region's errors in applying § 316(b) as described below, the Region also abused its discretion in failing to re-open the public comment period to allow Mirant Kendall and others the opportunity to comment on the Region's complete and substantive switches in its methodologies and justifications for certain of its determinations. These changes, which constitute the backbone of the Region's determinations, do not reflect the mere supplementation or augmentation of the Region's prior information and analyses, but are instead entirely new (but no less flawed) than those on which the Region previously relied. Mirant Kendall and others should have had the opportunity to comment on the Region's new set of analyses. As Mirant Kendall's earlier comments have shown, the Region's analyses are likely to evolve and improve substantially after reviewing and considering such comments.

1. Applicable and Relevant Legal Standard

Although the reopening of a comment period on a draft permit is discretionary, this Board has not hesitated to remand issues for additional public comment when necessary.[12/] It is also well-established that when an agency fundamentally changes the information or methodology behind a decision or conducts an entirely new analysis after the public comment period closes, it must re-open the public comment period.[13/]

In Idaho Farm Bureau Federation v. Babbitt, for example, the U.S. Fish and Wildlife Service ("FWS") added a snail species to the Endangered Species List.[14/] The FWS referred extensively to a provisional U.S. Geological Survey ("USGS") report in the

supplemental information accompanying its final listing decision.[15/] Petitioners asserted, and the court agreed, that FWS had not made the USGS report available to the public prior to close of the comment period.[16/] The court first noted that the only type of material that can be added to the administrative record without having to re-open the public comment process is material that merely expands on or confirms prior determinations, or that uses a consistent methodology to analyze the previously released data.[17/] The Idaho Farm court then held that the USGS report did not fall into this category.[18/] The court provided two reasons for this holding. First, it found that FWS "relied largely on the USGS study to support its final rule" and that "the USGS report was critical to [FWS'] decision to list the Springs Snail."[19/] Second, the court found that the "[o]pportunity for public comment is particularly crucial when the accuracy of important material in the record is in question."[20/]

In Ober v. EPA, the court considered whether the EPA violated the Administrative Procedure Act when it accepted and relied on additional information submitted by Arizona after the comment period and in response to EPA's request for additional information.[21/] Petitioners first learned of the additional material when EPA announced its final decision.[22/] The court agreed that EPA's acceptance of the "post hoc" justifications submitted by Arizona violated the Clean Air Act and the Administrative Procedure Act. In reaching this decision, the court noted that the post-comment information was the necessary justification, the "backbone" of the final decision.[23/] The court stated that "[t]he challenged post-comment period justifications did not merely expand on prior information and address alleged deficiencies. Instead, they addressed the submitted Implementation Plan's failure to comply with an essential provision of the

Clean Air Act. Therefore, they were relied on and were critical to the EPA's approval of the Implementation Plan."[24/] Another basis for the court's decision was that "the accuracy of the additional information submitted after the comment period is in question because Petitioners argue that many of the asserted justifications do not in fact support rejection of the control measures. These justifications should have been available for public comment before the EPA proposed approval of the Implementation Plan."[25/]

2. Additions to the Administrative Record after the Close of the Public Comment Period

The substantial number and scope of analyses added to the administrative record after the close of the public comment period strongly evidences that the Region did not fully analyze or understand all of the implications and issues surrounding its experimental design standards when it issued them as part of the Draft Permit Modification. In total, the Region added 84 documents constituting hundreds of pages to the administrative record after the close of the public comment period.[26/] The additions to the administrative record along with certain portions of the RTC demonstrate that the Region's analysis on several critical issues occurred primarily -- if not entirely -- after the public comment period closed:

- the Region's only analysis as to whether sufficient space existed in the Broad Canal for deployment of wedgewire screens -- one of the three exclusion technologies that the Region originally determined as available in the SOB and has retained per the RTC -- came after the public comment period closed;[27/]

- the Region's only analysis as to the feasibility of removing impinged organisms from fine-mesh traveling screens came after the public comment period closed;[28/] and

- as described in more detail below, the Region's only attempt to analyze the feasibility and effectiveness of the sweeping flow came after the public comment period closed.[29/]

It should be emphasized that Mirant Kendall is not criticizing the Region's failure to understand all of these issues at the time it created the Draft Permit Modification (although such a failure to fully grasp all of the issues is the natural and reasonably anticipated consequence of drafting a permit containing such experimental technology on the basis of little actual analysis). Rather, when an agency conducts a majority of its analysis on several key issues after the public comment period closes, as the Region has done here, it is required to re-open the comment period to subject those analyses to the same sort of public comment that its prior analyses received. Allowing an agency to put forward insubstantial and scant analysis for public comment, and then allowing it to conduct a majority of the analysis it should have done in the first place in a manner that is insulated from meaningful comment and review is inconsistent with the Administrative Procedures Act.

3. The Region Developed an Entirely New Methodology for the Requirement of an Induced Sweeping Flow

The Draft Permit Modification contained a proposal for an artificially induced sweeping flow past the face of an exclusion technology to "maximize the degree to which eggs and larvae that approach and/or are impinged on the exclusion technology are carried away from the media to a location that minimizes the opportunity for re-impingement."[30/] The SOB justified imposition of such an experimental, unproven, and never-before-deployed technology solely on the basis of a theoretical suggestion presented in 2003 by Coutant that the Region referenced in a footnote.[31/]

In its comments, Mirant Kendall pointed out in detail how neither Coutant's untested theory nor any other theory, study, or demonstration supported the conclusion

that an artificially induced sweeping flow past an exclusion technology can effectively minimize impacts of impingement or entrainment and do so in a manner that does not risk increasing other adverse environmental impacts.[32/]

In the RTC, instead of explaining why the Coutant theory (or anything else in the previous record) provided support for requiring an artificially induced sweeping flow, the Region switched its justification from its passing reference to the Coutant theory to a series of reports prepared by its consultant SAIC after the public comment period closed.[33/] That series of reports does not build upon, supplement, or further explain the Region's prior reliance on the Coutant theory. In fact, SAIC's and the Region's new approach is entirely and substantively different from Coutant's idea:

- Coutant's suggestion involves inducing turbulence across a very short distance, while SAIC's concept involves artificially inducing a sweeping current across hundreds of feet of an exclusion technology in a bounded area; and

- Coutant's theory is that induced turbulence may trigger a behavioral response in motile organisms, causing them to swim towards a bypass, while SAIC's artificially induced sweeping flow is intended to physically transport non-motile organisms hundreds of feet into a fish-return system.

Furthermore, Coutant's presentation provided no engineering details for such a system, nor did it estimate what such a system would cost to install and operate. On their face, the SAIC reports constitutes a complete change in analysis and methodology, and requires re-opening of the public comment period on that issue. Moreover, the newly proffered SAIC reports constitute the "backbone" of the Modified Permit's induced sweeping flow requirement, and accordingly should have been subject to public comment.

The importance of allowing Mirant Kendall to submit comments on the SAIC reports is underscored by the fact that the reports provide little objective justification for the artificially induced sweeping flow permit provision, and the conclusions SAIC reached are disputed by Mirant Kendall. As discussed in greater detail below, the SAIC reports do not focus on how or to what extent an artificially induced sweeping flow is expected to minimize impingement and entrainment, but rather upon how such a technology could be constructed. From SAIC's explanation of how such a technology might be constructed, the Region jumps to the conclusion that the technology would provide an effective means of carrying non-motile eggs and larvae past the exclusion technology in a fashion that reduces losses of eggs and larvae overall.[34/] But as discussed below, nothing in the SAIC analysis supports this conclusion, and Mirant Kendall disputes it on two grounds. One, the record does not contain any basis for a rational determination that the artificially induced sweeping flow will prove to be effective at all. Second, there is even evidence in the record (ignored by the Region and the SAIC report) that such an artificially induced sweeping flow may increase adverse impacts. As the courts in Idaho Farm and Ober recognized, the existence of contested issues raised by the new information on which the agency relied is an important factor warranting reopening of the comment period.

In sum, by first proffering nothing more than an inapposite theory in support of the effectiveness of an induced sweeping flow, and then developing a completely different justification after the close of the public comment period, the Region engaged in the type of "surprise switcheroo"[35/] that violates the Administrative Procedures Act.

B. Consideration of Costs

1. EPA Should Have Considered Costs and Benefits

The Region and Mirant Kendall agree that the Region expressly declined to compare the costs of its experimental technologies against the benefits those technologies can reasonably be expected to confer.[36/] Further, both the Region and Mirant Kendall agree § 316(b) authorizes the Region to conduct such an analysis,[37/] and that its authority to do so has been upheld by the United States Court of Appeals for the First Circuit in Seacoast Anti-Pollution League v. Costle.[38/] In filings made with the Supreme Court as part of the Court's review of Riverkeeper II, EPA itself has indicated both that it need not follow Riverkeeper II when issuing NPDES permits outside the Second Circuit, and that it continues to support the holdings in Seacoast.[39/] Moreover, as Mirant Kendall pointed out in its comments, the Determinations Document for the 2004 Draft Permit issued by the Region on June 14, 2004 contained an extensive discussion of the applicability of Seacoast to this permitting process.[40/]

Despite EPA's belief that it possess statutory authority to weigh costs against benefits, and its recognition that First Circuit precedent (the circuit in which the Region is located) expressly allows the Region to determine whether the costs of intake technologies are wholly disproportionate to their benefits, the Region has declined to conduct that analysis here.[41/] That failure requires remand.

The Region does not offer any reason for its refusal to consider costs and benefits in issuing the Modified Permit. In response to Mirant Kendall's comments on the law, the RTC contains the bare statement that "EPA has not compared the costs and benefits of various technology options in its determination of BTA for this and other post-

Riverkeeper II case-by case permits."[42/] The Region never provided any legal or policy reasons for this approach, however. Later, in response to Mirant Kendall's specific comments on the applicability of Seacoast and the appropriateness of weighing costs and benefits in the case, the Region's response is similarly uninformative, consisting of nothing more than conclusory statements, rather than any real explanation or rationale. For example, the RTC, in response to Mirant Kendall's arguments that Riverkeeper II is not controlling here and, in light of the pending Supreme Court decision, should not be applied, the RTC simply states that "EPA is complying with the Riverkeeper II decision."[43/] Similarly, in response to Mirant Kendall's comment urging application of Seacoast, the RTC states that "EPA disagrees with Mirant's interpretation of Seacoast," without explaining the basis for its disagreement.[44/] These bare statements, standing alone, provide no rationale or support for the Region's interpretation.

For these reasons, this Board should remand the Modified Permit to the Region and require the Region to explain whether it can rely on Seacoast in considering costs and benefits, and if so, why it has failed to do so here given the compelling and material factors in favor of doing so.

2. Facility-Specific Determination on Whether Costs can be Reasonably Borne

Both Mirant Kendall and the Region agree that, in determining which intake structure technology or combination of technologies is the best "available," the Region must consider the cost of the technology combinations or technology which can be "reasonably borne."[45/] In this case, however, the Region failed to consider costs in a meaningful and rational manner.

In the SOB, the Region summarily concluded that costs would not impact its availability analysis because Mirant Kendall's corporate parent had had a sufficient net income in the first six months of 2007 to afford the technologies proposed for Kendall Cogeneration Station.[46/] Mirant Kendall commented that such an approach to costs was irrational for several reasons:

- Mirant Kendall, and not its corporate parent, is the permittee here;[47/]
- Mirant Kendall is a single-purpose limited liability corporation that owns and operates Kendall Cogeneration Station and must be able to operate it in a profitable manner in order to remain in existence;[48/]
- Mirant Kendall is not a regulated entity capable of recovering its costs under a guaranteed rate of return;[49/] and
- The Region examined costs at the facility level in the relatively recent Brayton Point Station permitting proceedings.[50/]

The RTC did not provide a direct response to certain of these points raised by Mirant Kendall, and avoided providing any response at all to others. The gist of the Region's response was that it had found no legal authority specifying whether costs must be examined at the facility level or at the parent company level.[51/] Instead of examining the language, legislative history, or policy underlying § 316(b) or the other technology-based provisions of the CWA, the Region drew a wholly unwarranted analogy between affordability considerations under § 316(b) and the civil penalty provisions under § 309 of the CWA.[52/] This analysis by the Region is erroneous for the following reasons.

Determining on a BPJ basis whether a power plant can reasonably bear (afford) the cost of § 316(b) technologies inherently focuses on the facility itself. The issue is whether the additional costs will make the plant unprofitable or force it to shut down (and these are plant-specific issues) because the relevant question is whether the plant can

remain profitable. Mirant Corporation's 2007 Annual Report (which was readily available to the Region) contains a discussion of this principle: "[t]o comply with these legal requirements and the terms of our operating permits, we must spend significant sums .... We may be required to shutdown facilities if we are unable to comply with the requirements, or if we determine the expenditures required to comply are uneconomic."[53/] This consideration of profitability at the facility level is consistent with profit-maximizing corporate behavior, in which responsibility to shareholders dictates that investments with negative expected returns not be undertaken.

In the RTC, the Region believes there is an "undeniable similarity" between the "ability to pay" a civil penalty and the "reasonably borne" inquiries.[54/] But upon closer examination, the "undeniable similarity" disappears, causing the resulting analysis to be arbitrary and capricious. The two concepts are substantively very different. One is intended to punish and deter, and the other is intended to establish a substantive standard of economic viability. In the penalty context, the purpose is deterrence of improper behavior and the permittee has no choice about paying the penalty. The "reasonably borne" test, by contrast, involves a voluntary choice to be made by the permittee, whether to incur additional cost imposed by a new permit requirement. A cost cannot be considered "reasonably borne" if incurring that cost would be an economically irrational decision by the permittee. The "reasonably borne" affordability test therefore must assess the viability of the plant, whereas the "ability to pay" test for penalties is aimed at affecting the behavior of company decision-makers, who may well be at the corporate parent level. In essence, the goal is to make the penalty large enough so that decision-makers avoid violations in the future.

As the court stated in one of the cases the Region cites as support for considering parent company finances under § 309(d), a civil penalty is intended to "curtail the pollution of this nation's waterways by discouraging future violations."[55/] In Atl. States Legal Found., Inc. v. Universal Tool & Stamping Co., the court further stated:

> To further the objective of the Act, the amount of the civil penalty must be high enough such that the penalty does not merely become a cost of doing business. If not, it becomes more profitable to pay the penalty rather than incur the costs of compliance. Further, a substantial penalty reduces the likelihood that polluters will choose accepting the risk that non-compliance will go unpunished.

By contrast, the costs of the "best technology available" standard in § 316(b) are intended to be the "cost of doing business" and are used in an evaluation of whether the technology at issue is economically viable in the sense that facility owners will be willing to adopt the technology rather than choosing to go out of business to avoid incurring a cost they have no ability to recover. Such costs are not meant to be punitive or to deter non-compliance. In fact, to the contrary, these costs are intended to encourage compliance by being reasonably within the financial means of most individual facilities so that they may continue to operate as economically viable commercial entities.

Legislative history for § 316(b) states that "'best technology available' is intended to be interpreted to mean the best technology available commercially at an economically practicable cost."[56/] Although the Second Circuit in Riverkeeper II discounted this history, it should not be ignored. "Economically practicable" certainly suggests that the cost of the technology should not make a facility unprofitable. In the Phase II Rule, EPA itself provided for mitigating measures where compliance costs are significantly greater than agency estimates of costs:

> Under § 125.94(a)(5)(i) . . . if the Director determines that a facility's costs of compliance would be significantly greater than the costs considered by the Administrator for a like facility to meet the applicable performance standards,. . . the Director must make a site specific determination of best technology available for minimizing adverse environmental impact.[57/]

EPA's Technical Development Document ("TDD") for the Phase II Rule makes clear that the analysis of costs under § 125.94(a)(5)(i) is meant to occur at a facility-level, not a parent-level (or Firm-level).[58/] Also, EPA's economic analysis of the Phase II Rule looked at the Rule's costs versus the revenues of individual facilities.[59/] To the extent that its economic analysis addressed parent entities, it did so only in order evaluate whether the Rule would impose a disproportionate burden on parents with multiple Phase II facilities; that analysis did not contemplate that a parent's assets would be available to assist independent facilities with the cost of compliance.

Even the EPA's NPDES Permit Writer's Manual provides evidence that assessing the costs of a substantive standard under the CWA is far different from the punitive standards set forth in Atl. States.[60/] Indeed, the very act of applying for a permit for a point source discharge under the CWA is an explicit attempt to eliminate the risks of noncompliance and avoid the assessment of a penalty. Given these differences, the Region's analogy to penalty policy, and its contention that it can apply the same criteria it uses to assess civil penalties to its consideration of costs in setting substantive compliance standards, are arbitrary and capricious and not supported by the CWA, applicable case law, or the Region's own practices.

Apart from the Region's questionable analogy to penalties for violations, other reasons warrant not considering the financial status of the parent company when determining best technology available under § 316(b). Determining on a BPJ basis

whether a facility can reasonably bear (afford) the cost of a particular technology inherently focuses on the economics of the facility itself. The issue is whether additional costs will make the facility unprofitable and force it to shut down or whether the facility owner can reasonably expect to be able to recover the cost through the future operation of the facility. These are facility-specific issues because the relevant question is whether the facility can remain profitable. The profitability or viability of the parent corporation is not relevant. To make it relevant, it would have to be assumed that the corporate parent will inject money into an unprofitable facility for some reason. A corporation's responsibility to its shareholders dictates against such economically irrational decision-making.

Also, subsidiaries such as Mirant Kendall can be and frequently are sold or spun off as independent entities, which would undermine what at one time may have been considered a "reasonable" consideration of costs for an entire corporate family. A power company, subsidiary or otherwise, cannot, under virtually any circumstance, operate at a loss and expect to remain in existence, thus making facility-level inquiries into financial status the only accurate measure of what may be "reasonably borne by the industry."

And even if it were possible to include an assessment of the financial status of Mirant Corporation when considering costs for Mirant Kendall, such consideration would have to take into account more than Mirant Corporation's reported net income for half a year in 2007, which is all the Region has done here.[61/] For example, the fact that Mirant Corporation owns multiple subsidiaries would require that its financial status would thus need to be assessed on a proportional basis, which would likely produce the same result if

the inquiry was limited to any of Mirant Corporation's individual subsidiary's financial status.

After all, the costs of new requirements imposed at one of Mirant Corporation's subsidiaries could not be so great as to prevent it from meeting comparable costs for the same or similar requirements at each of its other subsidiaries. In fact, the Region has just issued draft NPDES Permit No. MA0004928 for the Canal Station, which is owned and operated by Mirant Canal, LLC, another Mirant Corporation subsidiary. That draft permit proposes that Mirant Canal retrofit Canal Station with closed-cycle cooling at a cost of over $200 million. So, even if the Region could rationally look to Mirant Kendall's corporate parent in its evaluation of costs, it must at least consider the cumulative and costly impacts of its own permit issuances (and those of other regions and regulators) before concluding that Mirant Corporation possesses unlimited financial resources.

Finally, the Region's attempts to explain away its change in course from the Brayton Point proceedings, where it examined cost at the facility level, to this permit proceeding, where it did not, are not rational.[62/] The Region argued that its change in methodology is justified because in Brayton Point it was examining whether retrofitting Brayton Station with closed-cycle cooling at an estimated cost of $120 million would be possible.[63/] The Region then pointed out that the magnitude of costs at issue here are much lower.[64/] This explanation, however, cannot rationally account for a complete change in the Region's approach for considering cost. While the magnitude of potential costs may logically affect the depth or detail of the Region's analysis, it cannot be used to

justify a consideration of whether a different corporate entity can reasonably bear the cost of compliance.

C. Adverse Environmental Impacts

1. Consideration of Environmental Impacts

Mirant Kendall's comments on the Draft Permit Modification demonstrated that the environmental impacts of IME at the Station were minimal, even de minimis, for multiple reasons.[65/] Those reasons include the setting of the Station's cooling water intakes within the Broad Canal and their relatively low intake velocities, which mean that impingeable fish generally avoid the intakes. Also, Mirant Kendall showed that many entrained organisms would have been advected out of the Charles River in any event. Mirant Kendall urged the Region to assess the actual environmental impacts of IME at the Station and whether any proposed technology would actually lead to any benefits.[66/]

In its RTC, the Region agrees that it has authority to follow the Agency's 1977 draft § 316(b) Guidance, which provides for comparative analysis of impingement and entrainment impacts on the affected population and ecosystem.[67/] Nevertheless, the Region declined to follow that guidance, contending that it has discretion to decide whether and when to evaluate the potential for meaningful population-level effects and indicating that it had decided in this case that no such evaluation is warranted.[68/] Instead, the Region decided in this case that the mere existence of IME deemed by the Region to be "significant" in the abstract represented adverse environmental impact that EPA should minimize by imposing the best technology available, whether or not the technology will lead to any larger improvements in the environment.[69/]

The Region offered no adequate explanation for its decision not to conduct a comparative evaluation in this case, having routinely done so in other cases including Brayton Point, which the Agency itself cites repeatedly as a model. That such an evaluation is difficult is not an adequate excuse. Nor did the Region reconcile the conflict between its failure to use the population information already in the record to perform a comparative environmental impact analysis before selecting BTA, while then requiring Mirant Kendall to perform extensive biological studies and use the results to assess population-level impacts of the intake after the BTA decision was completed.

Section 316(b) does not authorize or require the Region to arbitrarily disregard pertinent population information that is readily available (as it is in this case) and that, if compared to the impingement and entrainment values, would provide an appropriate context for the selection of the "best technology available for minimizing adverse environmental impact." Rather, the exercise of BPJ under § 316(b) requires assessment of all of the available information to determine the extent to which a proposed technology will bring environmental benefits beyond the immediate reduction of IME, as well as assessment of any other potential adverse environmental impacts that technology may cause. This section of the petition outlines how the Region has erred in failing to assess the actual environmental conditions and impacts relevant to IME at Kendall Cogeneration Station, and seeks remand by the Board requiring a full assessment by the Region to determine whether and what improvements to the Station's CWIS actually will achieve environmental benefits beyond the immediate reduction of IME. Other sections of the petition address the Region's errors in selection of the allegedly best technology available.

2. BPJ Determinations under § 316(b) Require Site-specific Assessment of Environmental Impacts and Benefits

In its comments on the Draft Permit Modification, Mirant Kendall urged the Region to undertake a careful, site-specific assessment of the extent to which existing IME at the Kendall Cogeneration Station was causing adverse environmental effects and to evaluate the extent of any benefits from the proposed additional technologies.[70/] Mirant Kendall based those comments on EPA's own words, including its 1977 guidance on determining BTA under § 316(b),[71/] and on the applicable legal standards as summarized in those comments and Mirant Kendall's prior submissions.[72/]

In the RTC, the Region adhered to its view that IME itself is an adverse environmental impact that must be minimized under § 316(b), whether or not the impacts of that IME are significant.[73/] Accordingly, the Region's view is that it need not conduct any more searching evaluation of whether that IME or measures to reduce it will have any significant environmental impacts. The Region also stressed that the 1977 guidance was only guidance rather than a set of binding requirements,[74/] and that in its national rulemaking under § 316(b), EPA had taken the position that IME itself was the AEI to be minimized.[75/]

Mirant Kendall acknowledges, of course, that the Region's RTC did then respond to some of Mirant Kendall's submissions on the limited extent of environmental impact caused by IME at the Station, and offered a variety of explanations why the impacts of IME are more substantial than Mirant Kendall asserts. The following subsections of this petition address those portions of the RTC. But the Region was clear that it "principally relied in this case" just on the existence of IME at the facility, that it was entirely within the Region's discretion whether to conduct any further analysis prior to imposing new

technological requirements,[76/] and that it had developed those new requirements based on engineering feasibility without conducting any analysis of whether they would bring actual benefits.[77/] Indeed, the Region went so far as to specify that it does not matter whether the technologies are "disappointing" in their results.[78/]

Mirant Kendall seeks this Board's review and reversal of the Region's approach. The RTC plainly seeks to erect legal bases for the Region's explicit avoidance of any direct assessment of whether the IME at the Station has a significant environmental impact or whether the required technology will matter. The Region's reasons for its avoidance behavior are explicit -- it complains that assessing these issues is difficult and therefore that it will rely just on the existence of IME at the facility.[79/] Fears regarding the effort or contentiousness of determining the actual adverse impacts from the IME or any substantial benefits from new requirements that may be imposed do not provide a rational basis for imposing those requirements. Instead, imposing requirements without any real understanding of either the degree of the problem being corrected or the efficacy of the corrections is arbitrary and capricious action.

A site-specific BPJ determination under §316(b) must mean more than just concluding that IME exists, therefore requiring installation of never-before-tried technology whether or not it works. The Region's position might be understandable if applied to a power plant believed to be having a major impact on local populations of an important species. But the record shows that the Kendall Cogeneration Station impinges relatively few fish -- in the low hundreds in recent years -- and that impingement is largely due to exogenous events rather than to any tendency of the CWISs to draw in healthy fish. The record also shows that organisms entrained by the CWISs do not

contribute significantly to local populations of adult fish due to the unrelated effects of advection and other conditions in the Lower Basin. The Region's responses to that record, as discussed below, do not substantially quarrel with the fact that the actual impacts of IME at the Station and any changes to the CWIS are not material to the local populations of the affected species.

On this record, accordingly, Mirant Kendall submits that the Region is required to do more than just point to the existence of IME at the Station. Rather, exercise of its authority under § 316(b) requires the Region to find that that IME is significant and that the proposed technology will matter. As the Region has explicitly declined to make such findings, the Board should reverse the Region's decision and remand with appropriate instructions.

3. The Region Did Not Adequately Assess the Environmental Impact of IME at Kendall Station

Mirant Kendall's comments on the Draft Permit Modification in Section 3, together with the related exhibits and the materials referenced in the record, documented that neither impingement nor entrainment at the Kendall Cogeneration Station were having significant impacts. Among other reasons are that the approach velocity of the CWISs within the relatively protected waters of the Broad Canal is already so low that healthy fish avoid them, and that in the unique circumstances of the Lower Basin most entrained organisms would have been advected out of the system anyway.

In the RTC, the Region acknowledged that Mirant Kendall's arguments were "plausible,"[80/] but found them unproven; acknowledged that advection occurs but found the losses due to advection not "ecologically equivalent" to losses due to entrainment;[81/] acknowledged that impingement numbers were dropping but dismissed that phenomenon

as irrelevant because the decrease was not attributable to action by Mirant Kendall;[82/] and dismissed Mirant Kendall's revised adult equivalency analyses based on MassDEP's review (on which Mirant Kendall had no opportunity to comment).[83/] But, more generally, the Region's RTC did not seek to show that IME at the Station was having any important impacts; rather, it continually reverted to reliance on its view that IME at the Station presents an adverse environmental impact that must be minimized whether or not that IME is having any impacts on the larger environment, so that the Region did not need to address the significance of that IME.[84/]

Mirant Kendall recognizes, of course, that there is room for much scientific debate about the biological significance of IME in a system as complex as the Lower Basin, and does not seek this Board's review of the competing arguments. It does note, however, that some of the Region's "biological" arguments sound more in legal casuistry than in biology. For example, an egg or larva swept out of the system and killed as a result of advection has the same biological significance as an egg or larva killed by entrainment -- each is equally dead and available as biomass for consumption by scavengers. And the Region too readily dismisses Mirant Kendall's evidence as plausible, but unproven wherever the evidence does not support the Region's beliefs, while at the same time the Region readily reaches determinations based on much less well-documented beliefs.

What Mirant Kendall does submit, however, is that the Region's refusal to look beyond the existence of IME as the basis for decision has led it to fail to ask or to determine whether the IME at the Station is in fact significant, and to fail to accord Mirant Kendall's comments and studies the weight they require in making an appropriate

site-specific BPJ determination under § 316(b). The Board should review the Region's response to Mirant Kendall's comments on the impacts of IME and remand with appropriate instructions.

4. The Region Did Not Adequately Assess Whether the Required Technology Will Achieve Environmental Benefits

Mirant Kendall's comments on the Draft Permit Modification also showed, as a corollary to the lack of significant impacts from the Station's existing IME, that the proposed improvements would not bring any significant benefits. That lack of benefits also stemmed from the likelihood that many of the proposed improvements would not be effective even if they reduced entrainment because the excluded organisms would not survive anyway.

In response, the Region's RTC largely disregarded any analysis of whether the suite of novel technologies would actually work to improve the local environment. In the Region's view, its task is defined and ended under § 316(b) by imposing the BTA to reduce IME whether or not there will be any benefits beyond that reduction. As one result, the RTC did not make any findings that the requirements of the Modified Permit would achieve any such improvements in the local environment, and emphasized that the Region was not imposing any performance standards for IME reduction on Mirant Kendall (such as had been contained in the 2006 Final Permit). While Mirant Kendall is relieved that the Modified Permit lacks such performance standards, which it had appealed for multiple reasons, the Region's unwillingness or inability to find that the required installations will lead to benefits is highly disturbing.

More is required in making a BPJ determination under § 316(b), particularly where the Region is requiring the installation of never-before-tried technologies such as

artificially induced flows and 0.5 mm screens. Without a finding that the required technologies actually will bring improvements to the local ecosystem, this permit is simply mandating a multi-million dollar experiment instead of BTA. The Board should review and remand the Region's refusal to make such findings with instructions to require installation of new technology only upon finding that in fact they will lead to local improvements.

5. Impingement

Mirant Kendall commented that most, if not all, of the fish that drifted into Kendall Cogeneration Station's intake were likely already dead or in the process of dying.[85/] In response, the Region stated how nothing in the record supported Mirant Kendall's argument. But in reaching this conclusion, the Region ignored the substantial data and information that Mirant Kendall did place in the record directly supporting its comment:

- Undisputed swim speed data for the size and species of fish that were impinged indicates that healthy fish have sufficient swimming ability to resist the intake velocities at Kendall Cogeneration Station. The EPA's own review of the scientific literature during the course of its Phase I and Phase II rulemaking reached the same conclusion: that swim speeds among most healthy fish were sufficient to resist the type of approach velocities measured in front of Kendall Cogeneration Station's current intakes;[86/]

- The three incidents of greatest (and extremely atypical) impingement -- upon which the Region heavily relies in finding adverse impacts -- occurred after a water line break that introduced pollutants into the Lower Basin that likely killed the fish that drifted into Kendall Cogeneration Station's intakes, and after two separate periods of high pollutant loadings due to a storm surge and/or high flows that also caused mortality to many fish. The fact that the impingement numbers at Kendall Cogeneration Station dramatically spiked after these potential mortality events provides strong evidence that the fish that were impinged had already died;[87/]

- Various sizes and species of fish are caught in relative abundance in the Broad Canal adjacent to the intakes disproportionately to the number of fish

impinged, suggesting that the fish present in the canal are able to resist the low intake velocities;[88/] and

- The majority of impingement occurs after the river herring spawning run, which weakens and causes mortality to fish.[89/]

All of this data -- none of which the Region disputed -- strongly suggest that the amount of impingement-mortality at Kendall Cogeneration Station is substantially lower than the already low numbers of fish impinged on the intakes. The Region has failed to rationally explain why -- in the face of this data and information -- it has still concluded that 100% of the fish impinged at Kendall Cogeneration Station experienced impingement mortality.

All the Region does in the face of this data is to argue that it should not be required to assess whether the fish that drifted into Kendall Cogeneration Station's intakes were already dead because that would be nearly impossible to do, and that § 316(b) does not require it to make such an assessment.[90/] There are several problems with the Region's attempt to abdicate its responsibilities under § 316(b). First, the Region cannot seriously dispute that § 316(b) only authorizes it to regulate impacts from impingement mortality, as opposed to just impingement of already dead fish. In fact, the portion of the 1977 Draft 316(b) Guidance that the Region cites to support its position actually supports Mirant Kendall's position: "[a]s a first order of approximation, 100 percent loss of individuals impinged, entrapped or entrained could be assumed unless valid field or laboratory data are available to support a lower loss estimate." (emphasis added).[91/] So the Region's very own guidance, offered in support of its position, supports Mirant Kendall's position that the Region cannot simply ignore the site-specific data and information summarized above in making the assumption that every fish impinged suffered impingement mortality.

Furthermore, even if there were adequate record support for the Region's apparent conclusion that all of the fish impinged by Kendall Cogeneration Station's intakes experienced mortality because of the intake, the level of impingement is comparatively small relative to the estimated populations of each species, weighing against finding that adverse impacts are anything more than de minimis.[92/]

D. BTA Determination

Both Mirant Kendall and the Region agree on many aspects of the standard to be applied in connection with the determination under § 316(b) of what constitutes the best technology available for minimizing adverse environmental impacts, if they exist:

- The Region is bound to apply its BPJ on a site-specific basis;[93/]
- The list of factors in CWA §§ 301 and 304 are relevant to BTA determinations under § 316(b). These factors include: the age of equipment and facilities, the process employed and process changes, cost, engineering aspects of applying technologies, and non-water quality impacts;[94/]
- A technology is not "available" under § 316(b) if it cannot feasibly be installed, constructed, or operated at a facility. Moreover, a technology is not available if the engineering challenges associated with its construction or installation would be sufficiently difficult;[95/]
- A technology is not best for minimizing adverse environmental impacts if any potential benefits are too uncertain or speculative;[96/]
- Minimizing adverse impacts from impingement means that the technology will reduce impingement mortality;[97/] and
- Section 316(b) does not require the minimization of all impacts where those impacts are de minimis.[98/]

In addition to these relevant standards, the Region cannot conclude that a technology is "available" unless that technology is "proven," meaning that it has been successfully used at similarly situated facilities. The language of § 316(b) itself limits the Region to technologies that are "available," which in the plainest meaning of the term does not

apply to technologies that have never been deployed or tested, and are purely conceptual in nature. While the Region largely seems to agree with this position, stating that whether a technology is proven is "one important factor for EPA to consider," it also states that whether something is proven is not an absolute requirement.[99/] But, at a minimum, the Region recognizes that it can only require an unproven technology so long as the record contains data from a similar deployment in an analogous industry or setting, or from a bench or pilot scale study that would support the conclusion that such a technology would be feasible at Kendall Cogeneration Station.[100/]

Applying these agreed-upon general standards as to what it means for a technology to be "available" and what it means for a technology to "minimize" impacts demonstrates that the Region's BTA determination was arbitrary and capricious and lacks rational support.

1. Availability of Technologies

As discussed above, the Modified Permit requires installation of an "exclusion" technology at Kendall Cogeneration Station from March 1 (subject to icing) until August 30 of each year. That exclusion technology must meet certain design or performance specifications, including:

- A mesh-size size no greater than 0.5 mm;
- a through-media velocity no greater than 0.5 fps;
- an automated airburst or backwash system to free debris and impinged organisms; and
- an artificially induced sweeping flow (located in a bounded environment) that is greater than the approach velocity to the exclusion technology as measured at 6-8 inches away from the face of the exclusion technology.

The Region claims that it has identified three available exclusion technologies capable of being deployed at Kendall Cogeneration Station and meeting these design specifications. These three exclusion technologies identified by the Region are: a fine-mesh net, an aquatic filtration barrier, and wedgewire screens.[101/]

But the record is clear that no exclusion technology meeting these design criteria has ever been deployed, tested, or even conceptually explored for use in conditions like those prevailing at Kendall Cogeneration Station, until issuance of the Draft Permit Modification and the Modified Permit. The Region does not dispute this fact in its RTC.

a. Fine-Mesh Barrier Net

The record is barren of any information suggesting that a fine-mesh barrier net with the mesh-size and through-media velocity required by the Modified Permit has ever been installed (or tested for installation) at a facility with Kendall Cogeneration Station's level of intake. Neither the RTC nor the Region's consultants dispute this fact. Therefore, the record cannot support anything but the conclusion that installation of the fine-mesh barrier net as contemplated by the Modified Permit would be an experimental deployment.

In order to justify why such an experimental deployment is available, the Region -- even under its own understanding of its obligations -- must be able to point to some data or other evidence to support the conclusion that such a technology could be feasibly deployed and operated at Kendall Cogeneration Station. But the record contains no such information. Instead, the Region relies solely on an engineering report prepared by its consultant, SIAC, which explains how it would be conceptually possible to install such a technology in the Broad Canal. Mirant Kendal submits that this highly theoretical report

(on which, as noted previously in this petition, Mirant Kendall had no chance to comment) provides inadequate support for the Region's conclusions.

The Region must rely on something more than an engineering study that such a technology could be installed. As discussed above, the record must demonstrate, and the Region agrees, that such an installation would be feasible. This requires something more than just a conclusion that a technology could be deployed in the abstract. For example, the small mesh-size could require such a continuous and unreasonable level of maintenance and repair just to keep it in place and functioning that the installation cannot be considered feasible in a practical sense.

This is why Mirant Kendall's proposal as to what constitutes BTA requires pilot studies that are necessary to help make the final BTA determination given the experimental nature of the required technologies. Until such site-specific study is complete, there is nothing in the record supporting the conclusion that this indisputably experimental and never-before installed technology could be feasibly installed and operated at Kendall Cogeneration Station.

b. Aquatic Filtration Barrier

The Region's identification of an aquatic filtration barrier as a potentially available technology is inconsistent with the Region's previous conclusion that an aquatic filtration barrier could not feasibly be deployed in the Broad Canal. The Region has changed its position abruptly, without explanation, and without allowing for any public comment on its new conclusion.

In the SOB, the Region concluded that an aquatic filtration barrier was not available for deployment in the Broad Canal: "[t]he size of this barrier suggests that

deployment would need to be in the Charles River because the Broad Canal will not accommodate such a large device."[102/] This conclusion was consistent with the conclusion reached by Mirant Kendall's consultants, and Mirant Kendall's comments reflected its agreement on this point.[103/] No other party submitted comments indicating that sufficient space did indeed exist in the Broad Canal to deploy an aquatic filtration barrier.

Indeed, everything in the record was consistent with a conclusion that an aquatic filtration barrier was not available for deployment in the Broad Canal. Nevertheless, the RTC disregards all of this analysis in concluding that an aquatic filtration barrier could be deployed in the Broad Canal. Because nothing in the record or comments could have alerted Mirant Kendall to the fact that the Region was still considering whether an aquatic filtration barrier could fit within the Broad Canal, this Board should remand the Modified Permit to the Region so that Mirant Kendall will have an opportunity to provide comments as to why the Region's complete change in direction and new "analysis" with respect to the availability of an aquatic filtration barrier in the Broad Canal is irrational.

For example, the only apparent basis for the Region's complete change in course appears to be a single, brief email solicited by the Region from the manufacturer of aquatic filtration barrier systems, which describes the design requirements for aquatic filtration barriers under different conditions.[104/] Input from the manufacturer of the aquatic filtration barrier (whose self-interest is readily apparent) with no supporting opinion from the Region's consultants, SAIC, or any other source provides an inadequate basis for a finding that an aquatic filtration barrier in the Broad Canal is an available technology. Furthermore, the content of the email itself does little to support the

conclusion that an aquatic filtration barrier could be located within the Broad Canal. First, significantly, the email concludes that an aquatic filtration barrier would have to be even larger than the one previously ruled out by the Region and Mirant Kendall as being too large for the space available. Second, the email expressly states that without additional flow testing and analysis, it is uncertain how large the aquatic filtration barrier would have to be in order to meet the specified through-media velocity.

In fact, Mirant Kendall's consultants, Alden Research laboratory, Inc. ("Alden") believes that even if an aquatic filtration barrier of that size could be installed in the Broad Canal, such an installation would still be highly experimental and would require flow modeling and testing to ensure that a uniform through-media velocity as required by the Modified Permit could be achieved, and, more importantly, to assure successful operation and to maintain the structural integrity of the aquatic filtration barrier.[105/] This is because the sheer size of an aquatic filtration barrier alone would mean that its far end would be located 400 feet away from the closest intake.[106/] Because the record does not contain anything indicating that maintenance of the through-media velocity on a barrier of such size would be feasible, the Region cannot rationally conclude that it would be.

Moreover, even if the record did contain sufficient modeling or flow studies suggesting that such a deployment is possible, those studies would necessarily require the installation of an inordinate number and complex series of perforated pipes or baffles and other such structures in order to make intake flows uniform. Such a complex deployment certainly presents more engineering challenges and hydraulic uncertainties than the fine-mesh barrier net and fish-return system that the Region concluded in its SOB presented

sufficiently difficult engineering complexity and biological uncertainty so as to render it unavailable.[107/]

Finally, the email from the aquatic filtration barrier representative indicates that there was a follow-up communication with the Region on the feasibility of a sweeping flow past the aquatic filtration barrier. This follow-up communication is not in the record, and nothing in the record otherwise documents this follow-up communication. In order to ensure that the administrative record is complete on the possibility of inducing a sweeping flow past the aquatic filtration barrier, Mirant Kendall requests a remand to the Region so that it can appropriately supplement the record.

c. Wedgewire

Installation of the type of wedgewire screens at Kendall Cogeneration Station contemplated by the Modified Permit constitutes the same sort of experimental application as the fine-mesh barrier net and aquatic filtration barrier. Accordingly, in order to justify such a requirement, the Region must provide some sort of data or other information demonstrating that such an experimental technology could be feasibly built and operated in the Broad Canal. The record currently contains none. Specifically, the Region must at a minimum evaluate whether sufficient space exists in the Broad Canal to install a wedgewire system. EPA's Technical Development Document for the Phase II Rule explains how "[c]onsideration of the impacts in terms of space and placement must be evaluated before selecting wedgewire screens for deployment."[108/] The record here presents no evidence that the Region gave any consideration to this issue.

As an initial matter, virtually all of the Region's analysis as to whether wedgewire screens could be available at Kendall Cogeneration Station occurred <u>after</u> the close of the

public comment period.[109/] The primary analysis on wedgewire screens in the SOB examined whether, as a general matter, wedgewire screens had the potential to minimize impacts from impingement and entrainment.[110/] In fact, the Region's only attempt to assess whether wedgewire screens could be feasibly constructed in the Broad Canal suggested that such a deployment was not feasible: "[t]he limiting factor for implementation of wedgewire screens at Kendall Station may be sufficient accessible space because additional screen assemblies consume more space."[111/] In its comments, Mirant Kendall agreed that nothing in the record supported a conclusion that sufficient space existed in the Broad Canal for a deployment of wedgewire screens according to the Region's design specifications.

It was not until after the close of the public comment period that the Region conducted any kind of analysis as to whether wedgewire screens as contemplated by the Draft Permit Modification could be feasibly installed and located within the Broad Canal.[112/] When the Region conducts such a new analysis and as a result reverses its previously stated position, that analysis must be subjected to the public comment period.

If Mirant Kendall had had the opportunity to comment on the Region's availability analysis concerning wedgewire screens, it would have pointed out that several significant flaws in that analysis undermine the Region's conclusion that wedgewire screens are available at Kendall Cogeneration Station. First, the Region's analysis on whether sufficient space existed in the Broad Canal is flawed and incomplete. It is flawed because the only basis for the Region's conclusion that sufficient space exists is its analysis of wedgewire screens manufactured by Intake Screens, Inc. ("ISI").[113/] After pointing out that these screens have a smaller, cone-shaped design, the Region

concludes that these sorts of screens "may be configured to fit within the space limitations of the Broad Canal."[114/] This conclusion is fatally flawed because the Region did not calculate how many of these smaller screens would be needed for Kendall Cogeneration Station's intake capacity, and whether sufficient size exists for deployment of that number of screens.

Further, the Region's only support for its analysis is a brochure provided by ISI that contains the specifications for its screens.[115/] But this brochure only shows specifications for wedgewire screens with a 1.75 mm slot-size, which is more than three times larger than the slot-size required by the Modified Permit of 0.5 mm. The number of wedgewire screens with a 1.75 mm slot-size that would need to be deployed to be consistent with Kendall Cogeneration Station's intake capacity is much fewer than the number of 0.5 mm slot-size wedgewire screens that would need to be installed. Therefore, the Region's conclusion that sufficient space is available in the Broad Canal for deployment of wedgewire screens has no record support.

Furthermore, Alden confirmed with ISI that ISI has not manufactured any wedgewire screens with a 0.5 mm slot size (although ISI did state it could build such a screen).[116/] This latter point also underscores how a wedgewire design with a 0.5 mm slot size is still an emerging technology given that such a mesh-size is not even made or marketed by the manufacturer whose information the Region cited. Finally, as discussed in more detail below, the Region also failed to adequately consider whether the public walkway (which was required to be built by Kendall Cogeneration Station's waterways license issued by MassDEP) currently under construction in the Broad Canal adjacent to

Kendall Cogeneration Station's intakes would preclude the deployment of wedgewire screens in the manner required by the Modified Permit.

In response to Mirant Kendall's comments suggesting that deployment of a 0.5 mm wedgewire screen was unprecedented, novel and sufficiently unproven as to render it unavailable (or at least to require additional testing), the Region's response was to cite to several other facilities that have installed wedgewire screens.[117/] But examination of the flow rates and slot-sizes at these facilities actually proves Mirant Kendall's point that use of 0.5 mm wedgewire screens is unprecedented under hydraulic conditions like those occurring at Kendall Cogeneration Station:

Station	Flow	Slot Size
Eddystone	633 mgd	6.4 mm
J.H. Campbell	489 mgd	9.5 mm
Jeffrey Energy Center	71 mgd	10 mm
Charles Point Recovery	55 mgd	0.5 mm
Logan Generating Station	7 mgd	1.0 mm

Of these examples, only the Charles Point Recovery facility uses screens with a 0.5 mm width. But the in-stream conditions under which those screens are used are markedly different than those at Kendall Cogeneration Station. The Charles Point screens are deployed 800 feet offshore in the Hudson River at a water depth of 22 feet.[118/] The hydraulics 800 feet offshore in a large river are very different than what would be expected at Kendall Cogeneration Station and the Broad Canal, and thus provide no evidence of the feasibility of deploying such screens at Kendall Cogeneration Station. The Hudson River is a dynamic, tidal bi-directional river which provides a sweeping velocity well beyond the approach velocity to the screens (1 to 3 ft/sec ambient and 0.5 ft/sec slot).[119/] Kendall Cogeneration Station is located on the Broad Canal (a dead end

canal) without sweeping river currents and all of the flow into the Broad Canal is generated by the intake. Artificially inducing flow by the screens in a confined area increases the density of debris and probability of debris impinging on the screens. At Charles Point the screens are in deep water and withdraw only a small percentage of the Hudson River (0.1% of tidal flow), which limits their interaction with debris.[120/]

In addition to the above listed facilities, the Region has referenced other uses of wedgewire screens. The SOB referenced data from wedgewire screens at Mirant's Chalk Point facility.[121/] However, this was an in situ pilot study (using screens with slot-sizes of 1.0, 2.0, and 3.0 mm) on a limited scale that could not provide the Region with support for the full-scale deployment required by the Modified Permit could be feasible at Kendall Cogeneration Station. Finally, the RTC cited to the Arbuckle Mountain Hydroelectric Plant as an example of why operating costs for a wedgewire system at Kendall Cogeneration Station should not be an issue.[122/] Arbuckle Mountain is located on a remote California stream that is characterized as "flashy."[123/] The unit is operated remotely as a run-of-river plant.[124/] When the facility is not generating the wedgewire screens do not operate.[125/] The wedgewire system consists of (8) 33" X 66" vertical cylinders; and, the total flow is 115 cfs; the slot width is 2.38 mm; and, the approach velocity is 0.33 ft/sec.[126/] This project bears little resemblance to the type of wedgewire installation the Modified Permit would require to be deployed in the Broad Canal at Kendall Cogeneration Station.

For these reasons, this Board should remand the Modified Permit to the Region to reassess its analysis of the availability of wedgewire screens for use at Kendall

Cogeneration Station and provide an opportunity for public comment on any revised analysis.

d. Induced Sweeping Flow

By far the most experimental and unproven design specification in the Modified Permit is the requirement for an artificially induced sweeping flow in a bounded area. The Region does not contest the fact that such a system has never been built. The record does not contain any information that such a system has ever even been designed or conceived before, except in connection with the Modified Permit. No data exist in or apart from the record to assess whether such a system could be feasible at Kendall Cogeneration Station.

All the Region relies upon in determining that such a system is available is that it is conceptually or theoretically possible. But if this were a sufficient basis for determining that a technology were "available" under § 316(b), then the availability requirement would have no real meaning since it would be bounded only by the limits of imagination. Reading a term out of a statute in this manner is prohibited, and this Board should remand the Modified Permit to the Region because the Region has ignored the plain-language mandates in § 316(b) that the technology required be available.

At a minimum, as the Region recognizes, if a technology has never been deployed before in the § 316(b) context, the record must contain evidence that that technology has been deployed in an analogous setting or industry, or that it has been tested or studied in some meaningful manner. The § 316(b) provisions in the Modified Permit do not meet this criteria.

Instead, the Region ignored or downplayed uncertainties and impediments in marked contract to the approach it has taken to assessing other experimental technology. For example, despite the fact that Filtrex intake technology has been tested and studied more than the artificially induced sweeping flow system required by the Modified Permit, Mirant Kendall is not aware of any instances of Filtrex being required under § 316(b). This is because EPA is, as it should be, taking a deliberate and measured approach with respect to this potentially promising technology by closely monitoring the lab and field studies and pilot testing that are being conducted. Such an approach demonstrates that § 316(b) does not allow for a technology to be taken literally straight from the drawing board and into the waterbody without any reasonable study or analysis.

e. Fine-mesh Traveling Screens

In its SOB, the Region eliminated fine-mesh traveling screens as BTA because of the engineering "challenges" associated with constructing a fish return system, and the "uncertainties" as to whether such a fish-return system could maximize the survival of the smallest stages of river herring larvae.[127/] This determination is problematic for three reasons. First, the Region's conclusion becomes irrational when juxtaposed with its acceptance of other technologies as "available" that the record unequivocally shows present greater engineering challenges or uncertainties about effectiveness than fine-mesh traveling screens. Second, the very alternatives that the Region proposed all require a fish-return system. Third, the Region's new sole reason for eliminating fine-mesh traveling screens as BTA rests entirely on a flawed analysis the Region performed after the close of the public comment period.

As to the first and second points, Mirant Kendall agrees with the Region that sufficient engineering challenges coupled with an uncertainty as to effectiveness render a technology unavailable under § 316(b). What Mirant Kendall takes issue with is the arbitrary and capricious manner in which the Region has applied this standard. Mirant Kendall specifically commented, and Alden has confirmed, that implementation of the artificially induced sweeping flow required by the Modified Permit presents greater engineering challenges than installation of the fine-mesh traveling screens with a fish-return system, and those mandated technologies all present greater uncertainties as to their performance.[128/] Reasoned decision making requires that the Region apply its own standards in a consistent manner.

The Region's only attempt at justifying its arbitrary application of its own reasoning is to set out a new rationale for why fine-mesh traveling screens are not available, for which it provided no opportunity for comment. The Region now claims that fine-mesh traveling screens are not available because it has data showing low survival rates for certain eggs and larvae that come into contact with the screens.[129/] But this new reasoning does not change the fact that the Region previously concluded that the type of fine-mesh traveling screen as contemplated by the SOB was unavailable because it presented sufficiently difficult engineering challenges and uncertainties regarding its effectiveness. Regardless of the new rationale, rational decision making requires the Region to find unavailable any other technology that would pose equal or greater engineering difficulties and biological uncertainties than those fine-mesh traveling screens.

Third, Mirant Kendall should have been provided an opportunity to comment on the Region's new ground for eliminating fine-mesh traveling screens because the very backbone of the Region's determination consists of analyses conducted after the public comment period. In the SOB, the Region concluded that survival rates for a fish-return system were uncertain. Then once Mirant Kendall agreed with this conclusion and the public comment period closed, the Region changed course and located data and studies it previously did not put into the record, and concluded that these new data and studies prove that fine-mesh screens should be eliminated due to poor survival rates.[130/] Again, nothing is wrong with such discoveries of additional existing data, but when the Region exclusively relies upon new studies or data added to the record only after the public comment period, Mirant Kendall should be given the ability to comment on them. This type of set-up and surprise switcheroo is prohibited by the Administrative Procedures Act.

2. Minimization of Impacts

Just because a technology may be "available" does not mean that it qualifies as the "best" for "minimizing adverse environmental impact." As discussed above, the Region must have a rational basis for concluding that that technology actually will reduce adverse environmental impacts. Even assuming that minimization of IME at Kendall Cogeneration Station were warranted, nothing in the record supports the Region's assumption that inducing a sweeping flow will reduce impingement mortality. In fact, the Region has not even attempted to assess whether impingement mortality would occur in more than de minimis numbers on the exclusion technologies required by the Modified Permit. In the absence of any data or analysis on this issue, the Region cannot impose

additional technologies to address potential impacts it has not even concluded would occur on the experimental technologies it has required in the Modified Permit.

Furthermore, the only relevant record evidence suggests that inducing a sweeping flow will exacerbate environmental impacts in the Broad Canal and Lower Basin. Even if this were not the case, the record contains no support for the slot-size and velocity requirements imposed by the Modified Permit, which may be overly stringent for minimizing impacts.[131/] Finally, a few provisions in the Modified Permit are unnecessarily duplicative of other existing protections, and therefore are overly stringent and will do little to promote any additional minimization.

a. Artificially induced Sweeping Flow

Examination of the record demonstrates that the Region acted arbitrarily and without record support in concluding that an artificially induced sweeping flow is needed to minimize adverse environmental impacts.

i. No Minimization of Impacts

First and foremost, there is no evidence in the record (because none exists) that an artificially induced sweeping flow in a bounded area such as the one contemplated in the Modified Permit has proven to be effective at minimizing impingement on and entrainment through exclusion technologies. The record is clear that such a system has never been installed, let alone studied. Without prior implementation in some form of an artificially induced sweeping flow as required by the Modified Permit, no basis exists in or apart from the record on which the Region could reasonably conclude that such hypothetical technology could actually minimize any impingement of eggs and very small larvae that would occur in the absence of such a flow.

The only document that the SOB relied upon in finding that an artificially induced sweeping flow could be effective was a presentation of a theory by Coutant in 2003.[132/] Mirant Kendall provided detailed comments as to why that theory -- even if it had been tested, studied or implemented somewhere -- provided no basis for determining that an artificially induced sweeping flow such as the one contemplated in the Modified Permit could minimize impingement or entrainment at Kendall Cogeneration Station. Coutant's theory explored whether an induced angled turbulence several feet away from a traveling screen could trigger a behavioral response in adult fish that would cause them to swim towards a by-pass.[133/] On its face, Coutant's theory provides no support for the Region's conclusion that an artificially induced sweeping flow throughout a bounded area hundreds of feet long and adjacent to an exclusion technology will prevent impingement of eggs and very small larvae. For example, Coutant's theory:

- only addresses potential impingement of fish, and not eggs and larvae;
- is premised on the notion that fish will have a behavioral response to turbulence that will cause them to swim towards a by-pass, and does not focus at all on whether a sweeping current could carry non-motile eggs and larvae away from an exclusion device;
- did not examine whether his proposed turbulent flow could be induced in a bounded area for hundreds of feet along an exclusion technology; and
- has never been tested, analyzed further, or deployed, as far as the current record is concerned.

The Region did not provide any rebuttal to Mirant Kendall's analysis as to the inapplicability of Coutant's theory other than to state that it could think of no reason why an artificially induced sweeping flow could not successfully transport organisms into a fish return system and out into the Lower Basin.[134/] But again, allowing such a justification to stand subjects § 316(b) to the whims and imagination of an agency, rather

than to sound and demonstrated scientific study and analysis reflected in an administrative record. Just because the Region cannot imagine a scenario under which its theory would fail, does not mean that a rational basis for imposing such a technology exists. DaVinci envisioned the possibility of manned flight, but no reasonable basis existed for concluding such technology was feasible and therefore available until hundreds of years later, after many additional scientific developments made it possible. Reaching a conclusion about the availability of technology based solely on an untested theory that can be described only through vague standards is arbitrary and capricious.

It is unclear whether the Region attempts to rely upon the National Marine Fisheries Service ("NMFS") criteria for fish passage or Washington Department of Fish and Wildlife ("WDFW") guidance for support of the artificially induced sweeping flow concept, but to the extent that the RTC does rely upon these sources, that reliance is misplaced. The NMFS and WDFW references apply to situations where water is being diverted from a river that has an existing flow.[135/] In these situations the existing water source (i.e., the river) is already flowing past the point of withdrawal. It is this natural river flow that is characterized as the sweeping flow. When considering a diversion, the requirement is that the sweeping flow exceeds the diverted flow. In each of these applications, a sweeping or by-pass flow is not being artificially created, as the Modified Permit requires to be done.

Finally, even assuming that the record supported the position that the artificially induced sweeping flow will prevent impingement on the exclusion technology of eggs and very small larvae, the artificially induced sweeping flow still would not provide any meaningful benefits because of the requirement that these organisms be returned to the

Lower Basin where, under average conditions, they will be advected from the system in approximately two or three days.

ii. Potential Increase in Adverse Impacts

While the record does not contain any information that an artificially induced sweeping flow would minimize any impacts, the Record does contain data, information, and analysis suggesting that such an artificially induced sweeping flow will actually cause harm.

First, the creation of the artificially induced sweeping flow will entrain more fish eggs and larvae than Kendall Cogeneration Station currently entrains because additional intake flow into the bounded area will be needed to ensure that a sufficient sweeping velocity exists. Both the Region and Mirant Kendall agree on this issue.[136/] The Region failed to analyze whether an artificially induced sweeping flow would have sufficient benefits to outweigh the negative impacts associated with greater levels of entrainment. The record indicates that the negative impacts of additional entrainment and the artificially induced sweeping flow may very well outweigh any benefits.

For example, there is no analysis on whether the additional eggs and very small larvae that are entrained or that still become impinged on the exclusion technologies would be materially fewer than the relatively low number of eggs and larvae currently entrained at Kendall Station. Even more importantly, the Region has not made any effort to assess whether there would even be any meaningful amount of impingement on the exclusion technologies required by the Modified Permit. Absent such an analysis, there can be no justification for requiring an artificially induced sweeping flow.

Moreover, once whatever number of organisms that may be impinged, if any, are impinged, their chances for survival are not improved by a sweeping flow because, even if they are freed from the technology, they will continue to bounce along the exclusion technology as many as 26 additional times (for a barrier net installation) before reaching the fish return.[137/] Such level of impingement and re-impingement is expected to increase mortality among fish larvae and many fish eggs.

The eggs and larvae that manage to make it through the bounded area and avoid impingement will not fare all that much better because, as described above, they will be pumped and deposited back into the Lower Basin in a location that will:

- subject them to an area of the Lower Basin most affected by Kendall Cogeneration Station's thermal discharge, an area that the Region has previously characterized (inaccurately) as being lethal to such organisms;[138/]
- be less hospitable to their growth and survival due to high salinities and low dissolved oxygen at depth in the Lower Basin;[139/] and
- accelerate their mortality due to advection from the system.[140/]

The Region has failed to address why subjecting eggs and very small larvae to these conditions is any improvement over being entrained by Kendall Cogeneration Station's current intakes.

In addition the Region has failed to fully and rationally consider whether the artificially induced sweeping flow will cause other adverse water quality impacts, which the record suggests are likely to occur. Specifically, the Region has failed to adequately consider the ramifications of the alteration of flows in the Lower Basin and the Broad Canal that will result from artificially-inducing a sweeping flow in the Broad Canal and then discharging that flow back into the Lower Basin. For example, the artificially induced sweeping flow and its accompanying fish return system could very well

discharge water back into the Lower Basin in a manner similar to Mirant Kendall's proposed diffuser, which the Region has previously determined would result in unacceptable risks to the water quality of the Lower Basin. Either a discharge such as that contemplated by the diffuser and the fish-return system will create intolerable risks to the water quality, or it will not. The record provides no basis for reaching differing conclusions regarding these two technologies. Rational decision making requires that the Region be consistent, or at least provide a rational analysis as to why it is being inconsistent.

Finally, as discussed above, the Region should have compared the costs and benefits of certain of the technologies required by the Modified Permit. Such an analysis is especially crucial with respect to the artificially induced sweeping flow requirement. The record is clear that any benefits from this technology are extremely limited. At most, this technology will extend the life of relatively few eggs and very small larvae by a couple of days (i.e., the period of time that it will take them to be advected from the Lower Basin once pumped back into it), which is a very minimal and abstract benefit.[141/] On the other hand, installation of the technology does involve more than minimal costs -- the Region's own consultants found that it could cost over $2 million.[142/] In the absence of any actual experience on which to base a cost estimate, there is a substantial risk that the actual costs will be much higher. Given this estimated cost, and the very limited and abstract benefits -- and, in fact, potential detriments -- that this technology may confer, this Board should remand the Modified Permit to the Region with an instruction that the requirement of an artificially induced sweeping velocity be removed from the Modified Permit.

3. Slot-size and Through-media Velocity

As mentioned above, because the record does not demonstrate that an exclusion technology as contemplated by the Modified Permit has been tested or deployed in a manner that would predict effectiveness at Kendall Cogeneration Station, further study is needed, as suggested by Mirant Kendall in its comments, in order to select a slot-size and through-media velocity that will be effective at Kendall Cogeneration Station. As discussed above, if the slot-size is too restrictive, its effectiveness can be negatively impacted by reduced performance as a result of bio-fouling or debris loading, or the constant need for maintenance.

4. Seasonal Deployment

The Modified Permit requires the primary exclusion technology -- which is required to protect against entrainment -- to be in place starting on March 1 of every year, unless icing conditions prohibit it.

First, as Mirant Kendall commented, this requirement is not needed to minimize any entrainment of eggs or very small larvae because the record does not indicate that there are any entrainables in the Broad Canal as of March 1 of any given year.[143/] As the Region has recognized, virtually all entrainment occurs at Kendall Cogeneration Station during only a few months out of the year.[144/] And, the earliest date that Mirant Kendall's ichthyoplankton sampling ever collected a larva was April 10.[145/] This was a smelt larva. The first river herring larva was collected on April 27.[146/]

Second, the requirement that installation occur unless icing conditions prevent installation is vague and could be difficult to comply with given that the exclusion technology will most likely have to be assembled and prepared on land first, and then

moved into the Broad Canal. This entire process could take some time, and would be subject to delays due to weather or other complications. Given that this permit provision could reasonably be interpreted as requiring the technology be in place instantaneously after ice has melted (although in early March there is always the possibility of re-freezing), and given that such deployment will not be possible due to the lead time required for getting the technology ready, the provision is vague and unreasonable.

For these reasons, Mirant Kendall requests that this Board remand the Modified Permit to the Region with an order altering the deployment date of any exclusion technology to April 1. The record demonstrates that April 1 is more than sufficient to protect against any entrainment, and provides Mirant Kendall with a realistic time for being able to get the technology in place.

5. Seasonal Flow Rate

The Draft Permit Modification did not change the limitations on flow rates as provided in Part I.A.1 of the 2006 Final Permit, which are 80 MGD as a daily limit and 70 MGD as an annual average calculated on a rolling basis, but 70 MGD as a monthly average for the individual months of April, May and June only.

Mirant Kendall's comments on the Draft Permit Modification requested elimination of that seasonal limit for those three months.[147/] A flow limit below the Station's operational capacity can force the Station to operate at levels below what the market would otherwise allow. Also, this flow limit is unnecessary and duplicative given the other proposed -- and now finalized -- impingement and entrainment reduction technologies. For example, the Region has established a low through-media velocity that

is well below the levels required to prevent impingement. The Region has also established a small enough mesh-size to minimize entrainment.

The Modified Permit did not change the flow rates as provided in the 2006 Final Permit. In the RTC, the Region did not show or even suggest that the flow limitation would have any noticeable benefits at Kendall Cogeneration Station. Rather, it just pointed to the general facts that those are the months when spawning and larvae are prevalent, that some limited numbers of eggs and larvae may still get through the exclusion devices, and that such a flow restriction is "available" for Kendall Cogeneration Station because over the past seven years during those months, the Station's monthly average flows have not exceeded 70 MGD.[148/]

In other words, because the Region thinks the restriction might help in some very small way and presents no engineering obstacles, it imposes it without regard to Mirant Kendall's operational needs. The record does not, however, support the Region's conjecture that the flow limit will have any benefit. Mirant Kendall requests that the Board remand with an instruction to remove that seasonal restriction.

E. Monitoring

The Modified Permit contains several revised provisions concerning biological monitoring and sampling that Mirant Kendall would be required to conduct. For the following reasons, certain of these provisions are arbitrary and capricious, not supported by the record, or exceed the Region's authority.

1. Overbroad and Unjustifiable Biological Monitoring and Sampling

The Modified Permit retains the Draft Modified Permit's unprecedented biological monitoring and sampling requirements. As Mirant Kendall has commented,

the Region has used the NPDES renewal process to commission Mirant Kendall to fund and implement a comprehensive, on-going study of the Lower Basin of the Charles River. For instance, the Modified Permit would impose on Mirant Kendall the obligations to conduct sampling of the entire Lower Basin and all the way up to the Watertown Dam. The Modified Permit would also require excessive weekly and bi-weekly (and sometimes thrice-weekly) sampling for as much as half of each year for the life of the Modified Permit. Consequently, Mirant Kendall renews its argument that the monitoring and sampling program is largely unrelated to Kendall Cogeneration Station's historical impacts or any reasonable expectations about its potential effects. To that extent, the Board should review Parts I.A.12 through I.A.14 and remand them to the Region for reconsideration.

2. Biological Monitoring and Sampling Requirements Not Legally Authorized

To the extent that the Modified Permit's monitoring and sampling program is untethered from the Kendall Cogeneration Plant's actual or expected impacts, it is not authorized by the Clean Water Act or its implementing regulations. Although Mirant Kendall acknowledges that the Region wields considerable discretion to impose monitoring requirements as part of its permitting process, that discretion has legal bounds. As Mirant Kendall has commented, the Clean Water Act and its regulations set outside limits on the amount of monitoring and sampling that the Region may require. Monitoring and reporting requirements must be "based upon [Kendall Cogeneration Station's] impact[.]"[149/] That is true whether the monitoring and reporting requirements are focused on adverse environmental impacts or state water quality standards.

Against this legal backdrop, the Region has not explained its decision to arbitrarily impose a prescriptive set of monitoring obligations without regard to Kendall Cogeneration Station's actual impacts. In fact, the Region's attempt to justify its approach only serves to underline Mirant Kendall's argument. The Region points out that the Modified Permit's monitoring requirements are authorized by the Clean Water Act to the extent that they "assure compliance with the Requirements [of the Act]."[150/] Then, the Region explains that permits must set forth reporting requirements "based upon the impact of the regulated activity." (emphasis by the Region).[151/] That is precisely Mirant Kendall's point: any monitoring-related requirements in the Modified Permit must be focused on compliance and, therefore, must be based on Kendall Cogeneration Station's impacts.

The Region's failure to justify its approach to biological monitoring stands in stark contrast to the approach prescribed by the Phase II Rule - an approach that neither the industry nor the environmental groups challenged as part of the Riverkeeper litigation. Mirant Kendall submits that the Phase II Rule reflects EPA's reasoned judgment as informed by public comment and shaped by the rulemaking process. As such, the Phase II Rule contemplated that monitoring requirements would begin following the design and installation of the entrainment-reduction technology. The scope of any monitoring would be limited to that required to verify performance of the selected technology.[152/] Under the Phase II Rule, the duration of any monitoring would have been limited to two years, rather than imposed for the life of the permit as the Region now proposes for the Kendall Cogeneration Station.[153/]

Finally, as Mirant Kendall also has commented, even if the Clean Water Act could be read more expansively to allow for some non-compliance based monitoring, the level of monitoring and sampling required by the Modified Permit exceeds any reasonable reading of the Act. The Board should review and remand the biological monitoring program with directions to the Region to tailor any biological monitoring program to permit compliance monitoring. The result should be a significantly less-extensive monitoring and sampling program.

3. Unsupported Daily Monitoring of Fish Mortality and Operational Curtailments

The Modified Permit leaves Part I.A.12 unchanged. That Part imposes a requirement that Mirant Kendall perform inspections daily throughout the year for dead fish. Consequently, Mirant Kendall renews its appeal that Part I.A.12 is overbroad and that the Region failed to justify the operational curtailments that would be imposed on Kendall Cogeneration Station in circumstances when fish mortality is entirely unrelated to its operations.

First, there is nothing in the record indicating that any fish kills in the Lower Basin have resulted -- in whole or in part -- from Kendall Cogeneration Station's discharge. Given the over 50 years of operations without such a documented incident that could plausibly be connected with its discharge, to impose such conditions on it now is arbitrary, especially in light of the thermal limits in the NPDES renewal permit that will limit Kendall Cogeneration Station's ability to discharge at past levels.

Second, the Region cannot justify the discharge curtailments and extensive fish collection and clean-up that would be required if the dead fish were not attributable to Kendall Cogeneration Station's discharge. Those actions would be required if dead fish

floated downstream into the inspection area from a portion of the Charles River not affected by Kendall Cogeneration Station's discharge. The Region responded that it could be beneficial to reduce stress to the receiving waters, whatever the cause of the fish kill, by ensuring that Kendall Cogeneration Station's discharge is kept below 95° F.[154/] There is no basis in the record, however, for finding that a reduction in Kendall Cogeneration Station's discharge temperature would have any benefits whatsoever with respect to fish kills not caused by the Station.

Third, the Region has never addressed Mirant Kendall's comments that there is no rational basis for requiring year-round monitoring for fish kills. The Region's basis for requiring such monitoring (i.e., alleged lethal or near lethal temperatures near the discharge) does not exist year round. To the contrary, in-stream temperatures only approach what the Region claims to be lethal levels during the warmest periods of the year.

Finally, the geographic scope of the inspection requirement is overbroad. The Modified Permit requires inspections at the zone of dilution, the Broad Canal, any deployed exclusion technology, and any deployed coarse mesh barrier net. Aside from the challenges of observing fish out in the River, fish outside of the Canal are even less likely to be impacted by the Station's discharge.

For all of the above-stated reasons, the Board should review and remand Part I.A.12 for further consideration by the Region.

4. Unnecessary and Harmful Net Sampling Requirements

Typical of the Modified Permit's overbroad approach to biological monitoring and sampling are the net sampling requirements in Parts I.A.14.d.1 through I.A.14.d.5.

Those Parts require Mirant Kendall to collect data on the Charles River and the Lower Basin. Such efforts are unlikely to produce data relevant to Kendall Cogeneration Station's operations, because the levels of impingement and entrainment attributable to Kendall Cogeneration Station are dwarfed by the impacts of the dams that prevent free passage of anadromous fish.[155/] For such sampling to be statistically significant, the sampling itself would have a far greater adverse impact than impingement and entrainment.

Even as now written, the Modified Permit's requirements, as both Mirant Kendall and the Massachusetts Office of Coastal Zone Management have commented, are likely to cause more harm than good to already low populations of river herring. As a result of the low numbers of river herring, the Massachusetts Division of Marine Fisheries ("MA DMF") has prohibited the taking of river herring, which prohibition would presumably include the river herring sampling prescribed by the Modified Permit.[156/] In response, the Region has unhelpfully explained that Mirant Kendall "must implement alternative available methods to obtain comparable information" on river herring.[157/] The Region, however, has not suggested any available alternative means for Mirant Kendall to use. The Region has not shown a connection between the Modified Permit's net sampling requirements and Kendall Cogeneration Station's impacts nor has it adequately explained how Mirant Kendall should comply with the Modified Permit given MA DMF's moratorium on river herring catches. Therefore, the Board should remand Parts I.A.14.d.1 through I.A.14.d.5 for reconsideration by the Region.

5. Unjustified Requirement to Report Sex and Reproductive Condition of Fish

Mirant Kendall commented that certain permit requirements have nothing to do with the regulated activity and pointed specifically to the Part I.A.14.d.9(a)(iii) that requires Mirant Kendall to determine the sex and reproductive condition of impinged fish. EPA responded that it could require Mirant Kendall to undertake such investigation because it is "biologically important to know" the reproductive condition of impinged fish.[158/] The Region has failed to justify this requirement as anything other than an attempt to satisfy its curiosity through research funded by Mirant Kendall.

The Region explains that these data collection efforts will not often be required, because they only apply when neither the primary nor the secondary BTA are deployed, but an unjustifiable requirement cannot be made reasonable by the infrequency of the obligation.[159] Nor is it true that the obligation will be all that infrequent; during design and construction of the exclusion technology, the traveling screens will be exclusively deployed and Mirant Kendall will be required to comply with the Modified Permit. The Board should remand the Modified Permit to the Region with an order that this provision be stricken from the Modified Permit.

6. Ichthyplankton Monitoring Requirements Are Not Feasible

As Mirant Kendall commented, it is not feasible to determine the condition of impinged eggs and larvae, as required by Part I.A.14.9.(b)(ii), in a manner that will provide useful data, because those organisms are likely to be damaged in the course of inspection.[160/] As a result, it will be impossible to determine whether their condition is the result of pre-impingement effects, impingement, or the collection and inspection methods. The Region suggests that Mirant Kendall could remove and inspect "test

sections" of the exclusion device, but that response is practically meaningless.[161/] On the one hand, the Region's "test section" proposal is not feasible for aquatic filtration barriers or wedgewire screens because of the inability to isolate sections of those technologies. On the other hand, the document to which the Region points does not propose a "method" that can be used with fine-mesh screens.[162/] In fact, that document only presents the general idea of using "test sections" and does not set out a "method" of collection at all.[163/] Furthermore, the Region has no rational basis for concluding that the use of test sections will not kill the impinged eggs and larvae, because there are no studies that support that conclusion. The Board should, therefore, remand the Modified Permit and require the Region to delete the requirement that Mirant Kendall determine the condition of impinged eggs and larvae.

7. Modified Permit Contains Gentle Removal Requirement

Part I.A.14.d.9.(b)(iii) of the Modified Permit requires that Mirant Kendall examine the exclusion technology after "the mechanism to gently dislodge the organisms has completed its activity[.]" Mirant Kendall assumes that retention of the reference to "gentle removal" was an oversight by the Region, because in its RTC the Region determined that a "gentle release" mechanism is unavailable.[164/] The Region further stated that it would revise the permit to eliminate any "gentle release" requirement. Accordingly, the Modified Permit should be remanded and revised to strike any reference to "gentle release."

F. Scheduled Outages

Part I.A.11.d of the Modified Permit contains a provision stating that "[t]o the extent practicable, the permittee shall ensure that scheduled maintenance outages occur

between May 15 and June 30." The provision also requires the Annual Monitoring Report to contain the dates of scheduled outages over the past year, and if the outages were not between May 15 and June 30 to "describe why it was not practicable for the outage to occur during this time period." The effect of this provision is to subject Mirant Kendall's internal maintenance operations to an uncertain standard. Unless Mirant Kendall is able to satisfy the Region that an outage was not "practicable," it will be in violation of the permit. In other words, this provision is a de facto regulation of when and how Mirant Kendall is allowed to operate. There are several independent reasons why this provision must be remanded to the Region.

First, because this is a brand new permit provision that does not represent a logical outgrowth from any previous provision, Mirant Kendall had no notice that the Region would be imposing a provision intended to police when and how and for what reasons Mirant Kendall could conduct its maintenance outages. This provision should be remanded to the Region with instructions that it take comment on it.

Second, the Region has no authority to regulate facility operations, such as maintenance outages, pursuant to § 316(b), which expressly only applies to intake technologies, and does not reach facility operations. Expanding § 316(b) in a manner to allow regulation of any facility operation that could be somehow tied back to operation of intakes for once-through cooling would subject virtually every internal facility decision concerning its operations to regulation. Section 316(b) cannot be construed in a manner that would effectively reach all, or a majority of all, facility operations at facilities using cooling water. Such an attempt to regulate internal operations is especially troublesome

here given that it affects Kendall Cogeneration Station during part of the year when demand for electricity is highest.

Third, such a requirement is needlessly duplicative here given that the Modified Permit contains provisions that the Region has determined constitute BTA for minimizing impacts. In other words, because the Region has concluded that the small mesh-size and low through-media velocities constitute BTA, such measures already provide more than sufficient minimization of any impingement and entrainment, and additional provisions such as the shut-down provision at issue here are not necessary.

Fourth and finally, this provision is far too vague to provide Mirant Kendall with any meaningful notice as to what the Region currently believes (or will determine at some point in the future) is a "practicable" reason for not having a scheduled outage during the relevant time period. Such a provision subjects Mirant Kendall's decisions as to how to operate its facility to second-guessing by regulators not in the business of operating power generation facilities.

G. Lack of Compliance Schedule

Mirant Kendall commented that the Modified Permit should contain a reasonable compliance schedule for the testing and implementation of any intake modifications. As grounds for this comment, Mirant Kendall cited to the need for pilot testing of any experimental technologies, the need to obtain the numerous non-NPDES related permits for any required modifications, the need to be free from the risk of citizen suits for non-compliance with the permit, and the obligation of Mirant Kendall's parent company to report any material violations of any environmental law in its securities filings.

In response, the Region agreed with Mirant Kendall that a compliance schedule would be needed.[165/] But, the Region also claimed that it was not authorized to issue compliance schedules in NPDES permits for implementation of § 316(b) technologies.[166/] Instead, the Region stated that it would issue a separate administrative order that contained a compliance schedule.[167/]

The first problem with the Region's response and proposed "solution" is that it does not address the very real danger that Mirant Kendall will be at risk for a citizen enforcement suit. Such a risk is especially great in the current circumstances where the record amply demonstrates how the local community -- including individuals and environmental groups -- have been actively involved in the permitting process.

The second and in some ways more significant problem with the Region's position is that it relies upon an erroneous interpretation of the law. The Region first cited to its regulations stating that a NPDES permit "may, when appropriate, specify a schedule of compliance leading to compliance with CWA and regulations.... [S]chedules of compliance under this section shall require compliance as soon as possible, but not later than the applicable statutory deadline under the CWA."[168/] The Region then relied upon Decision of General Counsel 41, ("GCO41") which says that § 316(b) determinations are bound by § 301(b)(2)(A), which requires compliance with BAT limits by the statutory deadline (then 1983).[169/]

The Region's interpretation of the applicable law is both incorrect and incomplete. It is true that CWA § 301(b) sets a "timetable" and that the dates in it have long passed: 1977 for BPT and water quality standards-based limits, 1989 for BAT (best available technology) for toxics and BCT (best conventional pollutant control

technology) for conventional pollutants. And it is true that an administrative consent order cannot extend a statutory deadline.[170/] But these dates are expressly for "effluent limitations," and § 316(b) requirements are not effluent limitations. Moreover, the timetable does not apply to requirements set after the dates in the statute.

But those two principles do not decide the present case, where the Region used "BPJ" to set new BTA requirements with a mere 73 days' notice before the Modified Permit's effective date. Congress never intended new technology-based requirements, set after statutory deadlines, to be instantly effective, and making them so in a permit would be arbitrary and capricious.

Further, it is not reasonable for the Region to conclude from GCO 41 that newly conceived § 316(b) requirements are immediately effective. GCO 41 also says that a technology is not "available" until it can be implemented:

> Under §316(b) the best technology available must, of course, be available. In other words, a compliance schedule under the §316(b) regulations must take into consideration the time necessary to implement the appropriate technology at a given intake structure.[171/]

In some cases, BTA under § 316(b) might entail substantial changes, and it might not be feasible to make the changes by the then-statutory-deadline of 1981.[172/] Thus, EPA's General Counsel concluded that while in some cases compliance might be called for before the deadline (where only modest alterations in design are needed, for example) in others it might not be feasible to meet the deadline.[173/] Thus "the benefits of a flexible case-by-case § 316(b) implementation schedule cut both ways."[174/]

The Region concludes from GCO 41 that there can be no compliance schedule for new § 316(b) requirements. In light of the passages quoted above, that conclusion is not a reasonable interpretation of the opinion.

Moreover, how EPA handled compliance schedules in the Phase II Rule shows that new § 316(b) intake requirements were never intended to be immediately effective. The Phase II Rule was published July 9, 2004, and effective September 7, 2004.[175/] It required permit renewal applicants to submit information "as expeditiously as practicable" but no later than January 7, 2008.[176/]

Even after the best technology available was selected, the Phase II Rule provided for a Technology Installation and Operation Plan that would include a schedule for installing and maintaining any new design and construction technologies, and downtime for installation or maintenance was to be scheduled to coincide with otherwise necessary downtime for repairs or maintenance as practicable and to minimize impacts to electric supply.[177/]

In this respect EPA has been consistent for over 30 years. In the preamble to the original § 316(b) rules, EPA said that compliance dates should be determined on a case-by-case basis taking into consideration compliance dates for limits on the discharge of heated effluent and other pertinent factors.[178/]

When EPA creates new BAT requirements for effluent limitations post-1987 it allows permittees time to comply. EPA's practice when publishing new BAT requirements after the 1987 BAT deadline has passed is to make the new requirements effective "immediately upon issuance or reissuance of the National Pollutant Discharge Elimination System (NPDES) permit."[179/] Thus, the permittee may have almost five years to install control technology (if the BAT requirement comes out soon after the NPDES permit has been issued or reissued). Moreover, in most cases the permittee will

have had several more years' warning about the BAT requirement that was likely to come because EPA would have published a development document and a proposed rule.

For these reasons, the Region's determination that it is not authorized to issue compliance schedules for the implementation of § 316(b) technologies relies upon an erroneous interpretation of the law, and the Modified Permit should be remanded with an order for the Region to include a reasonable compliance schedule in the Modified Permit as it has already recognized is needed.

H. Relationship of Thermal Limits to Impingement and Entrainment

In its comments, Mirant Kendall pointed out how the Region had ignored a meaningful interdependence between temperatures in the Lower Basin of the Charles River (which are affected by Mirant Kendall's discharge), and impacts due to impingement and entrainment.[180/] Mirant Kendall commented that the Region could not consider the Modified Permit's § 316(b) requirements in a vacuum without some consideration of the 2006 Final Permit's thermal discharge limits. This is because the analysis of minimizing impacts under § 316(b) is affected and influenced by thermal considerations in at least two ways.

First, the impact of the 2006 Final Permit's thermal limits should have been considered in connection with the Region's "adverse impact" analysis. This is because any historic levels of impingement and entrainment that the Region based its analysis upon will be reduced in the future should the 2006 Final Permit's thermal discharge limits take effect because those temperature limits -- which are oftentimes below historic ambient conditions in the Charles River during spawning season -- will prohibit Kendall Cogeneration Station from operating at historic levels throughout the spring and summer.

But the Region failed to account for the reduction in impingement and entrainment resulting from these curtailments mandated by the 2006 Final Permit's § 316(a) requirements.

Second, as Mirant Kendall commented, one manner in which to minimize any impacts of impingement and entrainment is to examine whether the 2006 Final Permit's thermal discharge limits are inconsistent with the Region's goal of reducing impacts from impingement and entrainment.[181/] Mirant Kendall pointed out that in-stream temperatures in the Lower Basin during the late spring and early summer higher than the in-stream limits in the 2006 Final Permit will actually enhance larval growth rates in a manner that will allow more larvae in the Lower Basin to achieve a size that will enable them to resist impingement or entrainment, and advection from the system.[182/] Mirant Kendall supported this observation through an analysis by its consultant, Normandeau Associates ("Normandeau"), that assessed the numbers of additional river herring larvae that would survive if the Modified Permit's thermal limits were consistent with those that Mirant Kendall proposed.[183/] This report demonstrated how Mirant Kendall's proposed thermal discharge limits of 72° F (as a 24-hour average) for April 15 through May 15 and 79° F (also as a 24-hour average) from May 15 through June 11 would be sufficiently protective and would minimize impacts due to impingement, entrainment, and advection.

The Region's first response to these comments was to claim that no response by it was needed because it had not withdrawn the provisions in the 2006 Final Permit relating to Kendall Cogeneration Station's thermal discharge limits, and was not accepting comments on provisions that were not withdrawn.[184/] But, as discussed above, the thermal analysis provided in Mirant Kendall's comments is directly relevant to the §

316(b) issues contemplated by the Region in connection with the preparation of the Draft Permit Modification and the Modified Permit. Likely realizing this critical interdependence, the Region did then proceed to prepare a substantive response to Mirant Kendall's comments on this issue.[185/] The Region's response, however, fails to provide a rational justification as to why it has ignored and discounted the interdependence of temperatures in the Lower Basin to its determinations under § 316(b).

The Region does not dispute Mirant Kendall's observation that warmer temperatures result in increased larval growth rates. But the Region claims that such warmer temperatures are not desirable because they result in decreased survival rates.[186/] In support of this statement, the Region cites to several different portions of its response to comments on the 2006 Final Permit.[187/] But none of these citations overcome the site-specific evidence in the record indicating that the temperature limits that Mirant Kendall has estimated as being optimal in the Lower Basin for minimizing impacts from impingement and entrainment are not close to the levels expected to cause mortality in the Charles River.[188/] The Region cannot rationally rely upon dubiously applicable lab studies in light of ample site-specific data on temperature tolerances.

The Region next attempts to explain how it is not in the business of engaging in "artificial temperature management," even if such a management of temperatures would be beneficial.[189/] But this rationale is inconsistent with other actions by the Region that are analogous to such temperature management, such as requiring an artificially induced sweeping flow as part of the Modified Permit to reduce impacts from impingement and entrainment. Moreover, the thermal limits in the 2006 Final Permit directly reflect temperature management in a manner that the Region believes to be beneficial. Either

the Region is in the business of "artificial management" to promote benefits, or it is not. Other requirements contained within the Modified Permit and the 2006 Final Permit show that the Region does take such action, meaning that the Region's stated justification for setting thermal discharge limits below optimal growth rates of juvenile river herring is arbitrary and capricious.

Furthermore, the entire Lower Basin is an extremely artificial environment due to the numerous man-made structures and changes that impact its ecology. In this sense, the conditions in the Lower Basin are highly artificial already, and do not come close to approximating what they would be like absent any man-made impacts. For the Region to suggest that setting thermal limits at a level that would benefit larval growth is some sort of offense to nature in light of the highly "artificial" setting of the Lower Basin provides scant support for its position.

Finally, the Region attempts to buttress its "artificial management" argument by claiming that artificially elevating temperatures shift population compositions.[190/] But the Region cites to no studies or data in the record demonstrating that such a population shift would likely occur under the optimal temperatures for growth proposed by Mirant Kendall. In fact, Mirant Kendall's years of sampling have not detected any discernible population shifts correlated to temperatures.

I. Impact of Walkway

In its comments, Mirant Kendall pointed out that under Kendall Cogeneration Station's Waterways License issued by MassDEP, Mirant Kendall is under an obligation to build a public walkway in the Broad Canal adjacent to and along the same shoreline as Kendall Cogeneration Station's intakes.[191/] Construction of this walkway is currently

underway, and Mirant Kendall provided a copy of the walkway design to the Region as part of the public comment process.[192/]

In specific reference to the walkway, Mirant Kendall commented that the Region had failed to consider how the walkway may limit or otherwise impact the intake technologies that may be available for deployment in that very same area of the Broad Canal.[193/] The Region responded with the conclusory statement that it had evaluated the walkway plans and had determined that the Modified Permit was consistent with the public walkway.[194/] But the only evidence in the record of this "consideration" is the Region's reference to Mirant Kendall's own proposal as to what constitutes BTA that proposed a design for a fine-mesh barrier net to be hung from the walkway.[195/] The problem with this being the extent of the Region's analysis on the walkway issue is that the Modified Permit does not allow for installation of Mirant Kendall's fine-mesh barrier as conceived by Mirant Kendall's proposed BTA. So determining that a proposal that it prohibited and that is very different from the one required in the Modified Permit is consistent with the walkway, does not provide a rational basis for the Region's statement that the Modified Permit is consistent with the walkway.

Furthermore, the record does not demonstrate any analysis whatsoever by the Region as to whether the walkway is consistent with an aquatic filtration barrier or wedgewire screens, which are the other two exclusion technologies the Region determined were available. As discussed above, the Region's only analysis regarding an aquatic filtration barrier and wedgewire screens did not reflect a consideration of whether they could be installed in a manner consistent with the walkway. The failure to conduct this analysis is made even more significant by the Region's analysis as to the aquatic

filtration barrier and wedgewire screens underestimating the amount of space necessary for installing an aquatic filtration barrier and wedgewire screens at Kendall Cogeneration Station, as discussed above.

Finally, the RTC suggested that, to the extent the technologies required by the Modified Permit were not consistent with the public walkway, Mirant Kendall would be responsible for changing its plans.[196/] This argument is irrational for a couple of different reasons. First and foremost, by the time that the NPDES permit subject to this petition is finalized and effective, the walkway will already be built. Because construction of the walkway will precede any finalization of the permit at issue here, Mirant Kendall will be unable to change or alter construction of the walkway infrastructure in order to make the walkway consistent with whatever § 316(b) provisions the permit under appeal will eventually contain. Second, the Region's cavalier statement that Mirant Kendall would have to modify its design for the walkway if the walkway were inconsistent with the final permit's §316(b) requirements ignores the fact that:

- Mirant Kendall has already delayed development of the walkway for several years, risking compliance enforcement from MassDEP, in order to ensure that it is consistent with whatever the Region determines must be deployed under § 316(b). Originally, Mirant Kendall designed the walkway in order to accommodate the fine-mesh barrier net that Mirant Kendall proposed installing as BTA, and which the Region endorsed in the 2004 Draft Permit. Since that time, the Region has changed its BTA determination three times, and Mirant Kendall can no longer delay development of the walkway while whatever BTA requirements the Region's final permit will contain are finalized; and

- Mirant Kendall would face significant obstacles in seeking a change in its plans for the public walkway at this point in time, particularly after the significant delay in its construction that this NPDES permit proceeding has already caused. Any further change in plans would have to be approved by numerous authorities, including: MassDEP, the Army Corps of Engineers, the Massachusetts Historical Commission, and the City of Cambridge Conservation Commission.

For these reasons, this Board should remand the Modified Permit so that the Region can provide an adequate assessment and analysis as to whether the public walkway limits the availability of any of the technologies that the Region determined could be installed in the Broad Canal.

V. IMPACT OF PARALLEL PROCEEDINGS

The joint issuance of the Modified Permit by the Region under the Clean Water Act and by MassDEP under the Massachusetts Clean Waters Act, accompanied by the MassDEP WQC under state law and § 401 of the Clean Water Act, cannot be relied upon by the Region as somehow insulating the Modified Permit from this Board's review. This is because, as discussed above, Mirant Kendall has appealed the MassDEP SWDP and WQC at the state level.[197/] One basis for Mirant Kendall's appeals is that the Massachusetts WQS neither require nor authorize any regulation at the state level of Kendall Cogeneration Station's intakes.

Water withdrawals in Massachusetts are regulated under the State's Water Management Act, M.G.L. c. 21G, while the Massachusetts Clean Waters Act ("the Act"), under which MassDEP promulgates the WQS, only governs discharges of pollutants to surface waters.[198/] In an attempt to extend its jurisdiction and the WQS to cover water withdrawals, and despite three decades of interpretating its jurisdiction under the Act as inapplicable to such withdrawals, MassDEP revised the WQS and claimed that MassDEP "has the authority" to condition an intake structure to ensure that the withdrawal activity complies with the Mass WQS.[199/]

Even as amended, however, the WQS do not provide authority for the Region to regulate the intake structures under the WQS. First, as to the Region, amendments to the Mass WQS are not "applicable" under CWA § 401(a)(1) until they have been approved under CWA § 303, and EPA has not yet approved the amendments. Second, the amendments are not authorized by Massachusetts law because the Act does not confer upon MassDEP, explicitly or implicitly, the authority to regulate water withdrawals, or

the intake structures at issue here by which such withdrawals occur. MassDEP is limited to the authority conferred by the Act. Any action that goes beyond MassDEP's statutory authority is ultra vires.[200/] The authority granted to MassDEP by the Act is clear: the Act governs the "discharge" of pollutants, the opposite of withdrawals.[201/]

Nor is MassDEP's interpretation of the Act due any deference. In Moot v. DEP, the court acknowledged that an agency's technical decisions are due deference.[202/] But elsewhere, the court had clearly explained that courts undertake a "more searching examination of whether agency action falls within the scope of its jurisdiction."[203/] At present, the question of MassDEP's authority is under litigation in Entergy Nuclear Generation Company v. Massachusetts Department of Environmental Protection.[204/]

So, because all of MassDEP's determinations in the WQC are under review at the state level, the Region cannot insulate itself from review by stating that the WQC compelled all of the provisions in the Modified Permit, and that as a matter of federal law, it could not draft any less-stringent requirements for the Modified Permit. In the event that any of MassDEP's determinations are overturned or modified at the state level, the Region's own determinations will stand alone and are subject to review by the Board.

Furthermore, review of the Region's determinations by the Board is necessary to avoid a Catch-22. MassDEP's regulations automatically stay state adjudicatory hearings on a state surface water discharge permit that also is a NPDES permit if there is an appeal of the NPDES permit to this Board. MassDEP's Office of Mediation and Dispute Resolution has already issued a stay under that rule, and has issued a similar stay of the proceedings on Mirant Kendall's appeal of the WQC. Accordingly, were this Board to decline review of permit provisions that the Region imposed in claimed reliance on state

requirements, and uphold them as federally enforceable on that basis, Mirant Kendall would have been deprived of any meaningful review of those provisions.

VI. CONCLUSION

Mirant Kendall respectfully requests that this Board remand the modified NPDES Permit No. 0004898 to the Region in the manner and for the reasons stated above.

Respectfully submitted,

MIRANT KENDALL, LLC

By its attorneys,

Ralph A. Child / KNB

Ralph A. Child, Esq.
Breton Leone-Quick, Esq.
Colin G. Van Dyke, Esq.
MINTZ, LEVIN, COHN, FERRIS,
GLOVSKY AND POPEO, P.C.
One Financial Center
Boston, MA 02111
Tel: (617) 542-6000
Fax (617) 542-2241

Kristy A. Bulleit, Esq.
HUNTON & WILLIAMS LLP
1900 K Street, N.W.
Washington, D. C. 20006-1109
Tel: 202-955-1547
Fax: 202-778-2201

Of counsel:

Hugh Davenport, Esq.
Senior Vice President and
Deputy General Counsel
Mirant Corporation

Dated: February 2, 2009

END NOTES

1/ A copy of the Modified Permit is available at http://www.epa.gov/region1/npdes/permits/2008/finalma0004898permitmod.pdf and is provided as Exhibit 1 within the Appendix to this Petition.

2/ The Region prepared an updated Administrative Record index on January 12, 2009 which Mirant Kendall will cite as "the 1/12/09 A.R. Index." A copy of that index sorted by document # is provided as Exhibit 3 within the Appendix to this Petition. A copy of the index sorted by document date is provided as Exhibit 4 within the Appendix to this Petition.

The 2004 Draft Permit is Doc. #202 on the 1/12/09 A.R. Index.

3/ As Mirant Kendall pointed out in its 2006 Supplemental Petition, the Region's October 12, 2006 A.R. Index failed to list the Mirant Kendall's October 15, 2004 Comments ("MK 2004 Comments"). Mirant Kendall has requested that the Region add its Comments to the administrative record that it submits to the Board and assumes that the Region will do so. Accordingly, Mirant Kendall will not burden the Board with duplicative copies.

4/ The 2006 Final Permit is Doc. #671 on the 1/12/09 A.R. Index.

5/ A copy of the MassDEP WQC for the 2006 Final Permit is Doc. #673 on the 10/12/06 A.R. Index.

6/ 475 F.3d 83 (2d Cir. 2007).

7/ See Entergy Corp. v. Riverkeeper, Inc., No 07-588 (United States Supreme Court).

8/ Neither the Draft Permit Modification nor the SOB was listed on the 1/12/09 A.R. Index. Mirant Kendall assumes that the Region will add the Draft Permit Modification and the SOB to the administrative record that it submits to the Board. Accordingly, Mirant Kendall will not burden the Board with duplicative copies.

9/ Mirant Kendall's comments on the Draft Permit Modification ("2008 MK Comments") is Doc. #736 on the 1/12/09 A.R. Index.

10/ The Region's 1/12/09 A.R. Index failed to list the RTC, but the RTC is available at http://www.epa.gov/region1/npdes/permits/2008/finalma0004898rtcmod.pdf Mirant Kendall assumes that the Region will add the RTC to the administrative record that it submits to the Board. Accordingly, Mirant Kendall will not burden the Board with duplicative copies.

11/ The MassDEP WQC for the Modified Permit was not listed on the 1/12/09 A.R. Index. Mirant Kendall assumes that the Region will add the WQC to the administrative record that it submits to the Board. Accordingly, Mirant Kendall will not burden the Board with duplicative copies.

12/ See, e.g., In re D.C. Water and Sewer Authority, NPDES Appeal Nos. 05-023, 07-10, 07-11, 07-12, 2008 EPA App. LEXIS 15, *112-114, citing In re Indeck-Elwood, LLC, PSD Appeal No. 03-04, slip op. at 28-29, 13 E.A.D. __; In re Amoco Oil Co., 4 E.A.D. 954, 981 (EAB 1993); In re GSX Servs. of S.C., Inc., 4 E.A.D. 451, 467 (EAB 1992).

13/ See e.g., Ober v. EPA, 84 F.3d 304 (9th Cir. 1996); Idaho Farm Bureau Federation v. Babbitt, 58 F.3d 1392 (9th Cir. 1995).

14/ 58 F.3d. at 1395.

15/ Id. at 1403 (noting that FWS "relied largely on the USGS study to support its final rule.").

16/ Id. at 1402.

17/ Id. (approving of a D.C. Circuit decision that upheld EPA's use of new data where the analytical methodology remained "constant").

18/ Id. (explaining that "the USGS study did not merely supplement or confirm existing data").

19/ Id. at 1403.

20/ Id.

21/ 84 F. 3d at 313.

22/ Id.

23/ Id. at 314.

24/ Id.

25/ Id.

26/ In response to Mirant Kendall's request, the Region provided an administrative record index during the public comment period in April, 2008. That index included documents through #699; later during the public comment period, the Region provided document #700, as well. The 1/12/09 A.R. Index includes documents through #784.

27/ RTC 4.43.3, at p. 4-106; see ISI Cone Screen for Shallow Problematic Intakes (brochure), dated January 1, 2008 is Doc. #759 on the 1/12/09 A.R. Index; Review of

Alden Research Laboratories Report Entitled "Induced Sweeping Flows and Feasibility of Gentle Removal – Response to Draft Permit Modifications NPDES Permit No. MA0004898", SAIC, dated June 19, 2008, is Doc #782 on the 1/12/09 A.R. Index; Investigation of Methods for Inducing Sweeping Currents at Mirant Kendall Station, SAIC, dated September 17, 2008, is Doc. #738 on the 1/12/09 A.R. Index; Investigation of Methods for Inducing Sweeping Currents at Mirant Kendall Station, SAIC, dated August 20, 2008, is Doc #784 on the 1/12/09 A.R. Index.

28/ RTC 4.7, at pp. 4-14 to 4-15.

29/ Infra Sections IV.D.1.d., IV.D.2.a.

30/ See Exhibit 4, Part I.A.11.a.(5), at p. 11; RTC 4.25, at pp. 4-57 to 4-58.

31/ See SOB, at p. 40 n. 28.

32/ MK 2004 Comment 4.25.8, at pp. 77-78.

33/ Investigation of Methods for Inducing Sweeping Currents at Mirant Kendall Station, SAIC, dated September 17, 2008, is Doc. #738 on the 1/12/09 A.R. Index; Review of Alden Research Laboratories Report Entitled "Induced Sweeping Flows and Feasibility of Gentle Removal – Response to Draft Permit Modifications NPDES Permit No. MA0004898", SAIC, dated June 19, 2008, is Doc #782 on the 1/12/09 A.R. Index; Region I Mirant Kendall Support - Task 2 Preliminary Bullets, SAIC, dated June 19, 2008, is Doc #783 on the 1/12/09 A.R. Index; Investigation of Methods for Inducing Sweeping Currents at Mirant Kendall Station, SAIC, dated August 20, 2008, is Doc #784 on the 1/12/09 A.R. Index.

34/ RTC 4.25.8, at pp. 4-66-4-67.

35/ See Env't Integrity Project v. EPA, 425 F.3d 992, 997 (D.C. Cir. 2005).

36/ RTC 2.01, at p. 2-2.

37/ RTC 2.00, at p. 2-1.

38/ 597 F.2d 306 (1st Cir. 1979); see 2008 MK Comment 2.3, at p. 12.

39/ See Brief for the Federal Respondents in Opposition, filed March 3, 2008 in Entergy Corporation v. EPA, No. 07-588 (U.S. Supreme Court), at pp. 13, 15, which is the Solicitor General's response to the petitions for certiorari in Riverkeeper II.

40/ 2008 MK Comment 2.3, at p. 13.

41/ See Seacoast Anti-Pollution League v. Costle, 597 F.2d 306 (1st Cir. 1979).

42/ RTC 2.00, at p. 2-2.

43/ RTC 2.3, at p. 2-18.

44/ RTC 2.1, at p. 2-15.

45/ RTC 6.1.1 and 6.1.2, at pp. 6-1 to 6-2.

46/ SOB, at pp. 38-39.

47/ 2008 MK Comment 2.19, at p. 22.

48/ Id.

49/ Id. at pp. 22-23.

50/ Id. at p. 23.

51/ RTC 2.19.1, at pp. 2-44 to 2-47.

52/ Id.

53/ Mirant Corp. 2007 Annual Report and Notice of 2008 Annual Meeting and Proxy Statement, dated March 14, 2008, which is Doc #765 on the 1/12/09 A.R. Index.

54/ RTC 2.19.1, at p. 2-45.

55/ Atl. States Legal Found., Inc. v. Universal Tool & Stamping Co., 786 F. Supp. 743, 753 (N.D. Ind. 1992).

56/ 118 Cong. Rec. 33,762 (1972), reprinted in 1 Legislative History of the Water Pollution Control Act Amendments of 1972, at 264 (1973) (Statement of Representative Don H. Clausen).

57/ 69 Fed. Reg. 41,576, 41,591 (Jul. 9, 2004).

58/ See TDD for the Proposed Section 316(b) Phase II Existing Facilities Rule, dated April 2002, at Appendix A (documenting EPA's cost estimates for individual facilities).

59/ See Economic and Benefits Analysis for the Proposed Section 316(b) Phase II Existing Facilities Rule, dated February 2002, at Chapter B2.

60/ See NPDES Permit Writer's Manual, at p. 71, which is Doc #579 on the 1/12/09 A.R. Index. ("'Reasonable' means that the conditions are achievable at a cost the facility can afford").

61/ SOB, at p. 39.

62/ RTC 2.19.5, at pp. 2-48 to 2-49.

63/ Id.

64/ Id.

65/ 2008 MK Comments 3.6-3.8, at pp. 39-42.

66/ 2008 MK Comment 3.7.2, at pp. 40-41.

67/ RTC 2.5, at p. 2-20.

68/ RTC 2.5-2.7.3, at pp. 2-20 to 2-23.

69/ RTC 3.0, at p. 3-2.

70/ 2008 MK Comment 2.7, at pp. 14-16.

71/ 2008 MK Comment 2.5, at p. 14; see Draft Guidance for Evaluating Adverse Impact of CWIS, U.S. EPA, dated May 1, 1977 (Exhibit 5 to 2008 MK Comments).

72/ 2008 MK Comments 2.7-2.18, at pp. 14-22; Further Submissions Regarding CWIS, dated October 29, 2007, which is Doc. #687 on the 1/12/09 A.R. Index.

73/ See e.g. RTC 2.2, at p. 2-3.

74/ RTC 2.5, at p. 2-20.

75/ See e.g. RTC 2.7.2, at pp. 2-22 to 2-23.

76/ Id.

77/ RTC 2.4, 2.7.5-2.7.6, at pp. 2-19, 2-24 to 2-26.

78/ RTC 2.7.6, at p. 2-26.

79/ See e.g. RTC 2.7.3, at p.2-23

80/ See e.g. RTC 3.1.1, at p. 3-6.

81/ RTC 3.4, at p. 3-20.

82/ RTC 3.2, at p. 3-15.

83/ RTC 3.0, at p. 3-2.

84/ RTC 3.0, at p. 3-2.

85/ 2008 MK Comment 3.1.2, at p. 32.

86/ 2008 MK Comment 4.10.4, at pp. 53-54.

87/ 2008 MK Comment 3.1.2, at p. 32.

88/ 2008 MK Comments 3.1.1, 3.2, and 4.10.2, at pp. 31, 34-35, 53.

89/ 2008 MK Comment 3.1, at p. 32.

90/ RTC 4.10.1, at p. 4-18.

91/ Id.

92/ River Herring and White Perch Impact Assessment For Mirant Kendall Station, dated April 28, 2008 (Exhibit 5 to 2008 MK Comments); Submission of 2006 and 2007 Biological Sampling Data, dated January 23, 2008 which is Doc. #692 on the 1/12/09 A.R Index.

93/ 2008 MK Comment 2.1, at p. 11; SOB, at p. 17.

94/ 2008 MK Comment 2.2, at p. 12; SOB, at pp. 17, 21.

95/ 2008 MK Comment 2.17, at pp. 20-21; SOB, at pp. 21, 29-30.

96/ 2008 MK Comments 4.7, 4.27, at pp. 51, 79; SOB, at pp. 18, 39.

97/ RTC 2.02, at p. 2-3 (citing support for EPA's interpretation that impingement mortality constitutes adverse environmental impact).

98/ 2008 MK Comment 2.7, at pp. 14-15; Determination Document for NPDES Permit No. MA 0004898, dated June 8, 2004 which is part of Doc #202 of the 1/12/09 A.R. Index.

99/ RTC 2.1, at p. 2-16.

100/ Id. at 2-17.

101/ RTC 4.22, at pp. 4-47 to 4-48.

102/ SOB, at 40.

103/ 2008 MK Comment 4.44.1, at p. 95; see also Application of the Filtrex Filtration System at Kendall Station Versus the Taunton River Desalination Plant, Alden Research Laboratory, dated April 30, 2008, which was included as Exhibit 12 to the MK 2008 Comments.

104/ Email from Andy McCusker (Gunderboom, Inc.) to George Papadopoulos (EPA) re: Kendall Fine-Mesh Barrier System Sizing and Layout, dated June 13, 2008, which is Doc. #758 on the 1/12/09 A.R. Index.

105/ See Kendall Station: Additional Responses to the Modified Permit, Alden Research Laboratory, dated January 30, 2009, at p.2, provided as Exhibit 5 within the Appendix to this Petition.

106/ Id.

107/ SOB, at pp. 39-40.

108/ TDD for the Final Section 316(b) Phase II Existing Facilities Rule, EPA, dated February 12, 2004, at p. 4-12.

109/ Infra Section IV.A.2.

110/ SOB, at pp. 34-35, 41; the SOB also briefly discussed costs at p. 38.

111/ SOB, at p. 41.

112/ Infra Section IV.A.2.

113/ See RTC 4.39, at p. 4-96; ISI Cone Screen for Shallow Problematic Intakes (brochure), dated January 1, 2008, is Doc. #759 on the 1/12/09 A.R. Index.

114/ RTC 4.39, at p. 4-106.

115/ See RTC 4.39, at p. 4-96.

116/ Exhibit 4, at p.1.

117/ RTC 4.43.3, at p. 4-106.

118/ Exhibit 4, at p.1.

119/ Id.

120/ Id.

121/ SOB, at pp. 34-35.

122/ RTC 4.24.7, at pp. 4-56 to 4-57.

123/ Exhibit 4, at p.1.

124/ Id.

125/ Id.

126/ Id.

127/ SOB, at pp. 39-40.

128/ 2008 MK Comments 4.25.3 and 4.35.1-4.35.2, at pp. 74-75, 85-87.

129/ RTC 4.7, at pp. 4-14 to 4-15.

130/ SOB, at p. 39.

131/ 2008 MK Comments 4.28-4.29.1, at pp. 79-81.

132/ SOB, at p. 40 n. 28.

133/ Induced Sweeping Flows at CWIS for Reducing Fish Impingement, Charles Coutant and Mark Bevelheimer, dated May 6-7, 2003, is Doc. #678 on the 1/12/09 A.R. Index.

134/ RTC 4.25.8, at pp. 4-66 to 4-67.

135/ Technical Evaluation of the Utility of Intake Approach Velocity as an Indicator of Potential Adverse Environmental Impact under Clean Water Act 316(b), Alden Research Laboratory, dated December 2000, at p. 1-2, which is Doc. #746 on the 1/12/09 A.R. Index.

136/ 2008 MK Comment 4.35.2, at pp. 86-87; Investigation of Methods for Inducing Sweeping Currents at Mirant Kendall Station, SAIC, dated August 20, 2008, which is Doc #784 on the 1/12/09 A.R. Index.

137/ Exhibit 4, at p.3.

138/ See Response to Comments D17 and F4, at pp. D25-D27, F3-F5 of the Region's September 2006 Response to Comments which is Doc. #672 on the 1/12/09 A.R. Index.

139/ Submission of 2006 and 2007 Biological Sampling Data, dated January 23, 2008, at Figures H-3 and H-4, which is Doc. #692 on the 1/12/09 A.R Index.

140/ River Herring and White Perch Impact Assessment For Mirant Kendall Station, dated April 28, 2008 (Exhibit 5 to 2008 MK Comments), at pp. 9-11.

141/ Id.

142/ Supra n. 33, at p. 8.

143/ 2008 MK Comment 4.36, at pp. 87-88.

144/ RTC 4.5, at p. 4-11.

145/ Supplement to the 1993 Application for Reissuance of the NPDES Reapplication, dated February 14, 2001, at Appendix 5-7, which is Doc. #279 on the 1/12/08 A.R. Index.

146/ Id.

147/ 2008 MK Comment 4.6, at pp. 50-51.

148/ RTC 4.6, at p. 4-13.

149/ 40 C.F.R. § 122.48.

150/ RTC 5.1, at p. 5-2.

151/ Id.

152/ 69 Fed. Reg. 41, 690 col. 3 (July 9, 2004).

153/ Id.

154/ See Response to Comment I6, at p. I7 of the Region's September 2006 Response to Comments which is Doc. #672 on the 1/12/09 A.R. Index.

155/ MK 2004 Comment G1, at pp. 93-94; supra n. 130, at 7-8.

156/ Notice of Extension of River Herring Moratorium, dated October 24, 2008, which is Doc. #766 on the 1/12/09 A.R. Index.

157/ RTC 5.3, at p. 5-6.

158/ RTC 5.1, at p. 5-3.

159/ Id.

160/ 2008 MK Comments 5.10-5.13, at pp. 103-104.

161/ RTC 5.10, at p. 5-13.

162/ Development of Filter Fabric Technology Determined to be BTA for Minimizing Environmental Impacts at Power Generating Facilities, Raffenberg et al., dated June 1, 2001, which is Doc #767 on the 1/12/09 A.R. Index.

163/ Id.

164/ RTC 5.11, at pp. 5-13 to 5-14.

165/ RTC 2.27, at p. 2-69 to 2-70.

166/ Id.

167/ Id.

168/ 40 C.F.R. § 122.47(a)-(a)(1).

169/ RTC 2.27, at p. 2-69; see also In re Brunswick Steam Elec. Plant, EPA GCO 41 (June 1, 1976) ("GCO 41").

170/ Student Public Interest Research Group of New Jersey, Inc. v. Fritzsche, Dodge & Olcott, Inc., 579 F. Supp. 1528, 1536 (D.N.J. 1984).

171/ GCO 41 at 199 (footnote omitted).

172/ Id.

173/ Id.

174/ Id.

175/ 69 Fed. Reg. 41,576 col. 2 (July 9, 2004).

176/ Id. at 41,687 col. 2, 41,691 col. 2.

177/ Id. at 41,689 col. 1.

178/ 41 Fed. Reg. 17,389 col. 1 (April 26, 1976).

179/ See 65 Fed. Reg. 3008 col. 2 (Jan. 19, 2000) (landfills); 65 Fed. Reg. 4360 col. 2 (Jan. 27, 2000) (existing direct waste combustors must comply with BAT limitations "as soon as their [NPDES] permit includes such limitations; existing indirect dischargers have three years to comply with pretreatment standards); 65 Fed. Reg. 49,667 col. 1 (Aug. 14, 2000) (deadlines for BAT for transportation equipment cleaning are established in the NPDES permits); 69 Fed. Reg. 51,893 col. 1-2 (Aug. 23, 2004) (as soon as the NPDES permits for concentrated aquatic animal production include such limitations).

180/ 2008 MK Comment 3.8, at pp. 41-42.

181/ Id.

182/ Id.

183/ Supra n. 140.

184/ RTC 3.8, at pp. 3-40 to 3-41.

185/ Id.

186/ Id.

187/ For citations, see id.

188/ Supplemental Petition, at pp. 71-94.

189/ RTC 3.8, at p. 3-41.

190/ Id.

191/ 2008 MK Comment 2.24, at p. 26.

192/ Proposed Broad Canal Walkway Design, Twining Properties, dated September 12, 2008, which is Doc. #757 on the 1/12/09 A.R. Index.

193/ 2008 MK Comment 2.24, at pp. 26-27.

194/ RTC 4.3, at p. 4-6.

195/ Id. at 4-5-4-7.

196/ Id. at 4-6-4-7.

197/ See Background section, supra.

198/ M.G.L. c. 21.

199/ See 314 C.M.R. § 4.05(3)(b)2.d., effective December 29, 2006.

200/ See e.g. Matter of Elec. Mut. Liab. Ins. Co., 426 Mass. 362, 366 (1998); Nuclear Metals, Inc. v. Low-Level Radioactive Waste Mgmt. Bd., 421 Mass. 196, 211 (1995).

201/ See M.G.L. c. 21, §§ 43(2), 44(1).

202/ 448 Mass. 340, 346 (2007).

203/ Goldberg v. Bd. of Health of Granby, 444 Mass. 627, 632-33 (2005).

204/ Suffolk Super. Court, No. 07-0366-H.

APPENDIX

- Exhibit 1: NPDES Permit MA0004898 - 12/18/08 Permit Modification

- Exhibit 2: Terms and Provisions from NPDES Permit No. MA0004898 Subject to Mirant Kendall's Appeal

- Exhibit 3: EPA Administrative Record Index - Sorted by Document Number

- Exhibit 4: EPA Administrative Record Index - Sorted by Document Date

- Exhibit 5: Kendall Station: Additional Responses to the Modified Permit, Alden Research Laboratory, dated January 30, 2009