COUCH WHITE
Counselors and Attorneys at Law

Couch White, LLP
540 Broadway
P.O. Box 22222
Albany, New York 12201
(518) 320-3401
Telecopier: (518) 320-3492

Barbara S. Brenner
Partner

email: bbrenner@couchwhite.com

brief

December 18, 2001

FILES
C 99-F-1164

VIA HAND DELIVERY

Commissioner Erin M. Crotty
New York State Department of
Environmental Conservation
625 Broadway, 14th Floor
Albany, New York 12233-1500

Re: Case 99-F-1164: In the Matter of the Application of Mirant (formerly Southern Energy) Bowline, L.L.C. for a Certificate of Environmental Compatibility and Public Need to Construct and Operate a Nominal 750 Megawatt Combined Cycle Combustion Turbine Electric Generating Plant in Haverstraw, Rockland County, New York

Case No. 3-3922-0003/00015

SPDES NO. 0264342

Dear Commissioner Crotty:

Enclosed for filing are an original and 3 copies of the "Brief on Exception of Mirant Bowline, L.L.C. on SPDES Permit Issues."

Very truly yours,

COUCH WHITE, LLP

Barbara S. Brenner

Barbara S. Brenner

BSB/sem
Enclosures
cc: Steven Blow, Esq. (via email and hand delivery w/encs.)
Hon. Kevin J. Casutto (via email and hand delivery w/encs.)
Honorable Janet Hand Deixler (via email and hand delivery w/encs.)
Hon. Gerald L. Lynch (via email and hand delivery w/encs.)
Meghan Purvee, Esq. (via email and hand delivery w/encs.)
Case 99-F-1164 Service List (via email and U.S. Mail w/encs.)

J:\DATA\Client1\08027\corres\sem704.wpd

NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION

In the Matter of Application for a State Pollutant Discharge Elimination System Permit Pursuant to Environmental Conservation Law (ECL) Article 17 and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Parts 750 et seq., and Air Pollution Control permits consisting of a Preconstruction permit and a Certificate to Operate, pursuant to the ECL Article 19 and 6 NYCRR Parts 200 et seq.

DEC No. 3-3922-0003/00015
SPDES NO. 0264342
Case 99-F-1164

BRIEF ON EXCEPTIONS OF MIRANT BOWLINE, L.L.C. ON SPDES PERMIT ISSUES

December 18, 2001

COUCH WHITE, LLP
540 Broadway, P.O. Box 22222
Albany, New York 12201-2222
(518) 426-4600

TABLE OF CONTENTS

INTRODUCTION

Mirant Bowline, L.L.C. ("Applicant" or "Mirant") seeks a State Pollutant Discharge Elimination System ("SPDES") permit under Article 17 of the Environmental Conservation Law ("ECL") and Parts 750, et seq., of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York ("NYCRR") in conjunction with its Application for a Certificate of Environmental Compatibility and Public Need Under Article X of the Public Service Law[1] for construction and operation of a nominal 750 megawatt combined-cycle electric generating facility ("Project" or "Bowline Unit 3") located at the Bowline Generating Station Property in the Town of Haverstraw, County of Rockland, New York.[2]

In accordance with the Hearing Report and Recommended Decision ("Recommended Decision") issued by Hearing Examiner Kevin J. Casutto on November 30, 2001, Mirant hereby submits this Brief on Exceptions and requests that the Commissioner find that the Gunderboom is a proven technology and that Mirant's hybrid cooling proposal with 2.0 mm wedge-wire screens and a Gunderboom Marine Life Exclusions System ("Gunderboom") is the best technology available ("BTA") for Bowline Unit 3.

---

[1] Case 99-F-1164: In the Matter of the Application of Mirant (formerly Southern Energy) Bowline, L.L.C. for a Certificate of Environmental Compatibility and Public Need to Construct and Operate a Nominal 750 Megawatt Combined Cycle Combustion Turbine Electric Generating Plant in Haverstraw, Rockland County, New York.

[2] On January 19, 2001, Southern Energy, Inc., the parent company of Southern Energy Bowline, L.L.C., changed its name to Mirant Corporation. Accordingly, Southern Energy Bowline, L.L.C. became Mirant Bowline, L.L.C. The name change had no effect on the issues in this proceeding. See Exh. 45.

SUMMARY OF POSITION

1. The intake structure proposed in the draft SPDES Permit is BTA for Bowline Unit 3 and, to the extent that the Recommended Decision concludes otherwise, it should be rejected.

2. The Hearing Examiner's recommendation that the Commissioner deem dry cooling as BTA for Bowline Unit 3 is inconsistent with the United States Environmental Protection Agency ("USEPA") Final Rule Implementing Section 316(b) of the Clean Water Act.[3] The USEPA Final Rule Implementing Section 316(b) of the Clean Water Act – "National Pollutant Discharge Elimination System – Regulations Addressing Administrator Cooling Water Intake Structure for New Facilities" ("Final Rule") – was signed by the USEPA Administrator on November 9, 2001.[4] Although the Hearing Examiner stated in his Recommended Decision that the Final Rule would be published in the Federal Register "soon" and would become effective nationally, he acknowledged that he did "not consider the substantive provisions of the proposed rule" when he evaluated the draft SPDES Permit conditions in this proceeding.[5] As more comprehensively set forth, infra in Point I.E., the Hearing Examiner's rejection of the

---

[3] See National Pollutant Discharge Elimination System: Regulations Addressing Cooling Water Intake Structures for New Facilities, 66 Fed. Reg. 65,256 (Dec. 18, 2001) (to be codified at 40 CRF pts. 9, 122, 123, 124 and 125) ("Final Rule"). To the extent the Recommended Decision contains definitions and recommendations that are inconsistent with the Final Rule, the Final Rule should control.

[4] See id.

[5] R.D. at 6 n. 8.

Applicant's proposed intake structure included in the draft SPDES Permit, i.e., designed for a maximum capacity of 7.5 million gallons per day ("mgd"), with a wedgewire screen and Gunderboom, is inconsistent with the Final Rule and must be rejected. His criticism and rejection of the BTA study conducted by DEC Staff,[6] especially considered in light of the Final Rule, also must be rejected. (See Point V.)

3. The Hearing Examiner's grant of Riverkeeper's motion for an adverse inference against the Applicant for alleged failure to comply with a discovery request[7] must be reversed, given Fact Finding 86 that the fabric requested by the Riverkeeper was provided by the Applicant.[8] (See Point II.)

4. The Hearing Examiner's reading of the Athens Interim Decision,[9] interpreting that decision as concluding that Gunderboom was, and is, an unproven technology, is manifestly wrong and contrary to the evidence in this record. (See Point III.A.)

5. The Hearing Examiner's determination that "the Gunderboom is an experimental technology"[10] is contrary to the record evidence and should be rejected. The Gunderboom technology is not experimental technology and the Commissioner should find "that

---

[6] Id. at 14-17, 40-41.

[7] Id. at 33, 68, Conclusion of Law 30.

[8] Id. at 58. It should be noted that there are two Findings of Fact numbered 85 within the Recommended Decision. The number "86" hereinafter will refer to the second of such Fact Findings.

[9] Id. at 16-17.

[10] R.D. at 46.

Mirant's hybrid cooling proposal with 2.0 mm wedge wire screen and Gunderboom is the best technology available for the Bowline Unit 3 site." However, if arguendo, the results of the tests are relevant, they do not demonstrate that biological growth will limit the effectiveness of the Gunderboom. (See Point III.)

6. The Commissioner should conclude that the Hearing Examiner's reliance on studies conducted by Riverkeeper was not justified, especially in light of the Hearing Examiner's conclusion that the record contains "credible criticism of the studies."[11] In addition, the Hearing Examiner's conclusion that the Riverkeeper studies are relevant to the assessment of a fully deployed Gunderboom should be rejected. The studies did not reflect a deployed Gunderboom with a fully functioning AirBurst system because, inter alia, as the Hearing Examiner acknowledged, "the fabric samples were too small and also because they were secured to the frame."[12] However, if, arguendo, the results of the tests are relevant, they do not demonstrate that biological growth will limit the effectiveness of the Gunderboom. (See Point III.E.)

7. The Commissioner should reject the Hearing Examiner's Finding 62[13] because, inter alia, the Lovett monitoring data supports the conclusion that the Gunderboom

---

[11] Id. at 30.

[12] Id. at 58, Finding 80.

[13] Id. at 55, Finding 62: "The selective use of seasonal data yields an invalid unreliable result. The Gunderboom has not reliably and consistently achieved such a high claimed exclusion percentage [75 percent or greater] for any one full deployment season, absent such selective interpretation of the monitoring data." Id.

provides reliable exclusion effectiveness. (See Point III.C. and Point III.D.)

8. The Commissioner specifically should adopt, as supported by the record, two of the Hearing Examiner's findings in support of a determination that the cooling water intake technology contained in the draft SPDES Permit is BTA. Those findings are that "Mirant's hybrid cooling alternative is approximately equivalent to the level of protection provided by use of dry cooling technology"[14] and that the 2001 American Shad Impingement Study conducted by DEC biologist Radle "supports a conclusion that adverse impacts of the Gunderboom related to impingement mortality would be de minimis."[15]

PROJECT DESCRIPTION

The description of the Project components in this brief is limited to those components that are relevant to the BTA determination, namely the cooling tower technology, the cooling water intake, the Gunderboom and the wedge-wire screens.

A. Cooling Tower

The Applicant proposes to construct a twelve-cell hybrid cooling tower.[16] The location of the hybrid cooling tower and its relation to the Project are depicted on Exhibit 155. The hybrid cooling tower will be located between the Hudson River and the Minisceongo Creek,

---

[14] Id. at 62, Finding 113.

[15] Id. at 28, 67, Conclusion of Law 26.

[16] Exh. 53 at 4.

approximately 250 feet from the west bank of the Hudson River.[17] The hybrid cooling tower will be approximately 650 feet in length. The tower box, which is the main structure of the hybrid cooling tower, will be approximately 55 feet in width. The total width, including the cooling tower basin, will be approximately 60 feet.[18] With the addition of the necessary access roadways, the total hybrid cooling tower footprint will be 750 feet in length by 135 feet wide, resulting in a total footprint of 101,250 square feet or 2.32 acres.[19] The hybrid cooling tower, with plume abatement equipment, will be approximately 68 feet in height.[20]

B. Intake Structure

The existing Bowline Units 1 and 2 cooling water intake structures are located on the northwest shoreline of Bowline Pond.[21] The Bowline Unit 3 intake structure will be attached to the southern side of the existing Bowline Units 1 and 2 water intake enclosure in Bowline Pond. The new intake pumps will be installed within the existing intake structure.[22]

---

[17] The proposed location is northwest of the site where the hybrid cooling tower originally had been proposed to be located. See Exh. 157. The proposed location is hybrid cooling tower alternative 2, as depicted on Exhibit 157.

[18] Id. at 4. Because the cooling tower basin does not extend above grade, the tower box size will be determinative of the visual impact of the cooling tower. The width of approximately 60 feet, including the cooling tower basin, relates to land use impacts. See id. at n. 2.

[19] H. Tr. at 2520.

[20] Exh. 53 at 4.

[21] H. Tr. at 1434.

[22] Id.

C. Wedge-wire Screens

The Bowline intake structure will be screened with 2 mm passive wedge-wire screens located at approximately mid-depth in the water column.[23] The screens will consist of wedgewire-type screen units with 2 mm slotted openings, sized to withdraw up to a maximum of 7.5 mgd of water for cooling water makeup. The screens will be Johnson Company cylindrical v-wire screens ("Johnson wedge-wire") or equivalent.[24] Each screen will measure approximately 1.4 meters in length and 1.4 meters in diameter. The screen design will include an AirBurst backwash system to ensure sufficient screen open area to maintain water velocities below design. The screens will be sized to ensure that the through-screen velocity will not be more than 0.5 feet per second.[25]

D. Gunderboom

The Bowline Unit 3 design includes a Gunderboom, which is a full-water-depth aquatic filtration barrier suspended by flotation billets on the water's surface and anchored on the floor of Bowline Pond.[26] The Gunderboom, which will be oriented at approximately a right angle to the existing Bowline Units 1 and 2 intake structure, will consist of a flotation hood, a

---

[23] Exh. 79, Draft SPDES Permit, at 8 of 15.

[24] Exh. 8, SPDES Permit Application, Attachment 1 for Bowline Unit 3, SPDES Permit Form 2C Supplement, at 1.

[25] Id.

[26] Exh. 28, Response No. 2 at 3.

Gunderboom two-ply reinforced curtain, rubberized plastic bottom skirts, anchor systems, an AirBurst system and monitoring equipment. It will surround completely the Bowline Unit 3 water intake structure. Thus, the Gunderboom will partition a space off from the rest of Bowline Pond and allow water passage through the curtain, while excluding marine organisms from the water intake structure.[27]

1. Flotation Hood

The flotation hood consists of flotation billets placed inside a sleeve of Gunderboom material. The sleeve with the billets is covered with vinyl. An air header hose runs the length of the Gunderboom. The air hoses belonging to each section are attached to the header hose.[28]

2. Gunderboom Curtain

The Gunderboom curtain is composed of two layers of Gunderboom fabric internally strengthened with a structural mesh net and lateral and vertical nylon supporting straps.[29] The two layers are quilted vertically, dividing the curtain into cells or sections. An air hose attached to the air header hose via an AirBurst array at the flotation hood is incorporated into each cell and terminates near the bottom of each cell. The fabric curtain will have 8000

---

[27] Id. at 3-4.

[28] Id. at 3.

[29] Id. at 3-4; H. Tr. at 1621.

perforations per square foot. The maximum pore size of the outside boom fabric will be 0.5 mm (opening size based on the industry standard test for determining the apparent opening size of a geotextile).[30] The inside boom fabric may have larger holes to facilitate boom cleaning.[31]

3. Rubberized Plastic Skirt

A rubberized plastic skirt will be fitted at the Gunderboom's base and will follow the depth contours along the track of the boom.[32] Pre-installation steps will include positioning hardware along the existing Bowline Unit 1 and 2 intake structure bulkhead for boom attachment, as well as preparation of the area where the boom comes on shore so that effective seals are achieved.[33]

4. Anchor Systems

The anchoring system will consist of deadweight concrete blocks of approximately 15 tons each, located approximately 30 feet apart on either side of the deployed Gunderboom.[34] The rubberized plastic skirt of the system will be attached to the bottom of the

---

[30] H. Tr. at 2391.

[31] Exh. 79, Draft SPDES Permit, at 8 of 15.

[32] Id. at 9 of 15.

[33] Id.

[34] Id.; Exh. 28, Response No. 6 at 10.

Gunderboom fabric curtain.[35] A ballast chain will run through a sleeve at the bottom of the rubberized plastic and the anchoring apparatus will be attached to the chain. The Gunderboom curtain will be manufactured to fit the bottom contours of Bowline Pond to create a full, passive curtain barrier extending from the bottom of the rubberized plastic skirt and the flotation hood.[36]

The Gunderboom will interface with the shore via a bulkhead or other specially prepared shoreline structures to which the ends of the Gunderboom will attach. Anchor chains will run from the concrete block anchoring structures to the ballast chain found in the rubberized plastic bottom section of the filter curtain.

5. AirBurst System

The AirBurst system is a curtain cleaning system which periodically expels a burst of air at the bottom of each cell in the Gunderboom curtain.[37] An air header hose is connected to the air compressor machinery and runs the length of the flotation hood. Air hoses belonging to each cell or section of the curtain are attached to this header hose. An air hose attached to the air header hose via an air burst array at the flotation hood is incorporated into each cell, and terminates near the bottom of each cell. Sediment, which may have accumulated on the Gunderboom, is dislodged by periodically injecting a large burst of air through the air hose into each cell. As the air exits the cell, the air travels upward (expanding as it does so) and outward

[35] Exh. 28, Response No. 2 at 4.

[36] Id.

[37] Id., Response No. 9 at 15.

through the fabric to dislodge sediment and other materials from the Gunderboom. The frequency and sequence of the air purges (cleaning) of the Gunderboom curtain is monitored and controlled by computerized control systems.[38]

6. Monitoring Equipment

There will be a full and formal Bowline Unit 3 Gunderboom system operation monitoring program with lights and audible alarm system warnings to call immediate attention to any excursion from acceptable operational conditions.[39] Warnings will be visible in the control room and regular monitoring, observations, and response to warnings will be part of regular shift operations.[40] In addition, the boom will be equipped with both strain gauges and water level monitors to further detect and alert operations personnel of any need for additional cleaning cycles.[41] Further, in addition to routine visits and inspections, Gunderboom, Inc. will monitor the operational data.[42] The Bowline Unit 3 system will have a complete spare boom at the Project site in the event a complete boom change-out is deemed desirable.[43]

There will be continuous recording of the AirBurst cleaning cycles and data will

---

[38] Id.

[39] H. Tr. at 1459.

[40] Id.

[41] Exh. 79, Draft SPDES Permit, at 9 of 15.

[42] H. Tr. at 1459-1460.

[43] Id. at 1460.

be available from an electronic control and remote monitoring system which is a Supervisory Control And Data Acquisition ("SCADA") System.[44] The AirBurst system, as an integrated component of plant operations, will have back-up air supply alternatives, which will be accessed automatically if the primary system were to fail.[45] The AirBurst system will include a dedicated commercial air compressor with a redundant, backup air supply compressor.[46]

In addition to the monitoring program, there will be daily visual inspections of the Gunderboom collar, which will be performed by the plant operators, to ensure that the Gunderboom is oriented properly.[47] Monthly diver inspections of the anchor lines will be performed to verify that the Gunderboom is maintaining a proper seal along the bottom of Bowline Pond.[48]

DRAFT SPDES PERMIT

The draft SPDES Permit would authorize the construction and operation of a cooling water intake structure designed for a maximum capacity of 7.5 mgd and an average of approximately 6.5 mgd water withdrawal from Bowline Pond.[49] It requires the wedge-wire

---

[44] Id. at 1459-1460.

[45] Id. at 1457.

[46] Id. at 1459.

[47] Exh. 29, Response No. 12 at 21.

[48] Id.

[49] Exh. 79, Draft SPDES Permit, at 8 of 15.

screen units to be sized to allow withdrawal of up to a maximum of 7.5 mgd from Bowline Pond with a design through screen velocity of not be more than approximately 0.28 feet per second ("fps") at average water use, with a maximum through screen velocity not to exceed 0.5 fps for makeup cooling water.[50] The draft SPDES Permit also requires that the design of the intake structure include an AirBurst backwash system to ensure sufficient screen open area to maintain design water velocities below limits.[51]

The draft SPDES Permit includes an approximately 137 feet long Gunderboom which will be installed at approximately a right angle to the existing Bowline Units 1 and 2 intake structure in water depths averaging 27.5 feet.[52] The maximum pore size of the outside boom fabric is specified to be 0.5 mm.[53] The draft SPDES Permit states that the inside boom fabric may have larger holes to facilitate boom cleaning.[54] The draft SPDES Permit also states

---

[50] Id.

[51] Id.

[52] Id. at 8 of 15. In its draft SPDES Permit Comments, the Applicant indicated that the maximum water depth in the vicinity of the Gunderboom is 27.5 feet, where the attachment will be made to the existing intake structure. However, the average water depth over the length of the Gunderboom will be approximately 15 feet. Exh. 48 at 4. Exhibit 116, which was filed on June 22, 2001, after the issuance of the draft SPDES permit, contains detailed drawings of the intake location and the Gunderboom design. It indicates that based on more detailed engineering design, the Gunderboom will be approximately 155 feet at an average depth of 15 feet.

[53] Exh. 79, Draft SPDES Permit, at 8 of 15. As the Hearing Examiner held, such openings should be measured in accordance with the methodology outlined in Dr. Marr's testimony. See R.D. at 33, 68, Conclusion of Law 28.

[54] Exh. 79, Draft SPDES Permit, at 8 of 15.

that the flow through velocity of the Gunderboom at 7.5 mgd will be approximately 1.4 fps.[55]

The draft SPDES Permit provides that the Gunderboom anchoring system will consist of deadweight concrete blocks of approximately 15 tons each, located about 30 feet apart on either side of the deployed boom. A rubberized plastic skirt, which will be fitted along the base of the Gunderboom, will follow the depth contours along the track of the boom and will extend both onshore and offshore from the boom chain line. A computer controlled air back-wash system at fixed intervals will provide for automatic cleaning of the boom. In addition, the boom will be equipped with both strain gauges and water level monitors. The draft SPDES Permit requires the Applicant, before any in-water construction of the intake system begins, to submit to the Chief, Bureau of Habitat, and to the Chief, Bureau of Watershed Compliance of DEC, final engineering drawings and other descriptive materials.[56]

The Draft SPDES Permit would authorize use of the discharge stream from the existing Bowline Units 1 and 2 only between October 1 and the following February 14 when either Bowline Unit 1 and/or Bowline Unit 2 are operating.[57] However, the Hearing Examiner recommends that, if the Commissioner finds that Mirant's hybrid cooling Gunderboom proposal is BTA for Bowline Unit 3, then the Bowline Units 1 and/or 2 discharge stream be utilized

---

[55] Id. at 8-9 of 15. Based on Exhibit 116, a more accurate description would be: The Gunderboom will have a design hydraulic loading rate of approximately 1.6 gpm/ft^2 of fabric at a maximum flow of 7.5 mgd. In its draft SPDES Permit Comments, the Applicant indicated that the reference to a 1.4 fps flow through velocity was misstated. The correct units are "gpm/ft^2," not "fps." See Exh. 48 at 11.

[56] Exh. 79, Draft SPDES Permit, at 9 of 15.

[57] Id. at 12 of 15.

whenever it is available.[58] DEC Staff proposed this change in its Reply Brief to the Hearing Examiner.[59] As the Recommended Decision indicates, the Applicant originally proposed such reuse.[60]

The draft SPDES permit provides that during the period from February 15 to September 30, in the event of functional failure, the facility may operate without the Gunderboom for up to 15 days.[61] The draft SPDES Permit states that any failure of the Gunderboom to operate and/or provide entrainment protection for at least 75% of the time the facility is operational during a 24 hour period be considered one day for purposes of calculating the number of days the facility has operated without the Gunderboom.[62] Failure of the Gunderboom to be completely operational and functional, or discontinuance of its use, for a period of greater than 15 days during the period from February 15 through September 30 would violate the terms of the draft SPDES Permit.[63]

The draft SPDES Permit also would require certain maintenance procedures to be followed for the period of February 15 through September 30. Those maintenance procedures require: (1) daily visual checks of the Gunderboom collar; (2) monthly dive inspections of the

---

[58] R.D. at 10-11.

[59] Id. at 12-13; 65, Finding 10.

[60] Id. at 65, Finding 11.

[61] Exh. 79, Draft SPDES Permit, at 9 of 15.

[62] Id. at 9-10 of 15.

[63] Id. at 10 of 15.

anchor lines; (3) operational verification of the automated AirBurst cleaning system (including an alarm system in the Bowline Unit 3 control room). The draft SPDES Permit also would require biological monitoring.[64]

POINT I

BASED ON THE SUBSTANTIVE PROVISIONS OF USEPA FINAL SECTION 316 (b) REGULATIONS, APPLICANT'S PROPOSAL IS BTA FOR BOWLINE UNIT 3

On November 9, 2001, the USEPA Administrator signed a Final Rule implementing Section 316(b) of Clean Water Act.[65] The Final Rule was published in the Federal Register on December 18, 2001 and will become effective on January 17, 2002.[66] Once the Final Rule is effective, all states are required to implement it, although states have the right to adopt

---

[64] Id. at 10-11 at 15. Although not an issue here, the draft SPDES Permit also includes requirements pertaining to water quality. The draft SPDES Permit requires that the water temperatures, dissolved oxygen, and turbidity of intake water be measured and recorded during entrainment sampling. Id. at 11 of 15. The Applicant has requested that the Siting Board issue a Section 401 Water Quality Certification in accordance with 16 NYCRR §1000.7.

[65] See Final Rule, supra note 3. Prior to December 18, 2001, the application and breadth of CWA § 316 (b) was determined on a case-by-case basis by the federal and state administrative agencies and courts charged with jurisdiction to enforce the statute's terms. This resulted from the lack of effective USEPA regulations interpreting the BTA standard. See Appalachian Power Co. v. Train, 566 F.2d 451, 455 (4th Cir. 1977).

[66] See Final Rule at 65,256, 65,317.

more stringent requirements.[67] The regulations apply to "new facilities"[68] - - those meeting certain criteria set forth in the regulations and for which construction commences after the effective date of the Rule.[69] Because construction of Bowline Unit 3 will not commence until after the effective date of the Rule, the facility constitutes a "new facility" within the meaning of its terms. The USEPA stated that the Final Rule "establishes best technology available for minimizing adverse environmental impact associated with the intake of water from waters of the U.S. at these [cooling water intake] structures."[70]

Although the Hearing Examiner did not consider the substantive provisions of the new regulations in the Recommended Decision,[71] he invited the parties to express their views "on how this rulemaking does or does not affect the DEC BTA review" in the Briefs on Exceptions.[72] It is the Applicant's view that the USEPA Final Rule provides the parties to this SPDES proceeding with definitive guidance on the application of Section 316(b) to cooling water intake structures ("CWISs"). As detailed herein, Track I of the Final Rule is a self-

---

[67] See 33 USC §§ 1341, 1342 (b); Final Rule at 65,338, §125.80(d); see also, Final Rule at 65,321.

[68] Final Rule at 65,256.

[69] See Final Rule at 65,338 - 65,339, §125.83; see also Id., Final Rule at 65,261.

[70] Id. at 65,260.

[71] Email from Honorable Kevin J. Casutto, ALJ, Office of Hearings and Mediation Services, to the Parties (Nov. 30, 2001, 02:41 EST) (correspondence accompanying unofficial electronic version of Recommended Decision).

[72] Id.

implementing regulation. If an Applicant's proposed CWIS meets the Track I requirements, then it is BTA for the specific site where the Applicant proposes to construct the CWIS. As set forth below, Mirant's proposed Bowline Unit 3 CWIS satisfies the Track I requirement of the Final Rule and, thus, is BTA for Bowline Unit 3.

A. BTA Criteria Under the USEPA's Final Regulations

In implementing CWA § 316(b), the USEPA has adopted national performance standards applicable to each of the factors delineated by the statute -- location, design, construction and capacity of CWISs -- which must reflect the best technology available for minimizing adverse environmental impact. The USEPA has determined that: (i) control of intake velocity; (ii) the implementation of proven design and construction technologies; and (iii) flow reduction commensurate with a level achieved by closed-cycle recirculating wet cooling systems constitute BTA for minimizing such impact.[73] The USEPA stated that it interprets the use of the word "minimize" in Section 316 (b) of the Clean Water Act to include technologies that "very effectively reduce, but do not completely eliminate, impingement and entrainment as meeting the requirements of section 316 (b) of the CWA."[74]

In order to implement its standards, the USEPA has adopted a "two-track" system whereby an applicant may choose the standards with which it proposes to comply. The USEPA has determined that its two-track scheme "represents the best technology available for

---

[73] Final Rule at 65,284.

[74] Id. at 65,282.

minimizing adverse environmental impact."[75] Track I establishes uniform requirements, whereas Track II provides an opportunity to establish that alternative requirements which will achieve comparable performance, are BTA.[76] Track I of the Final Rule is self-implementing. Applicants planning to install a closed-cycle cooling system are assumed to choose Track I, the "fast track".[77]

New facilities with a design intake flow from equal to or greater than 2 mgd, but less than 10 mgd, may chose to comply with the velocity, proportional flow and design and construction standards of Track I of the Final Rule.[78] Because Bowline Unit 3 is designed for a maximum capacity of 7.5 mgd, the Track I standards are applicable to Bowline Unit 3. Those standards are set forth below.

1. Velocity

The USEPA stated that "[i]ntake velocity is one of the key factors that can affect the impingement of fish and other aquatic biota."[79] The USEPA "uses the design through-screen velocity as a component of best technology for minimizing adverse environmental

---

[75] Id. at 65,273.

[76] Id.

[77] Id. at 65,323.

[78] Id. at 65,273.

[79] Id. at 65,274.

impact."[80] The maximum through-screen design intake velocity must be less than or equal to 0.5 feet per second ("fps").[81]

2. Location

The Final Rule provides a proportional flow requirement for different types of bodies of water. The USEPA stated that "apart from the proportional flow requirements, [the Final Rule] does not include specific national requirements for new facilities based on location of the cooling water intake structure."[82] The USEPA requires that a CWIS located in a tidal river, such as the lower Hudson River, be designed and constructed:

> such that the total design intake flow from all [CWISs] . . . over one tidal cycle of ebb and flow must be no greater than one (1) percent of the volume of the water column within the area centered about the opening of the intake with a diameter defined by the distance of one tidal excursion at the mean low water level.[83]

The USEPA concluded that the proportional flow requirement for tidal rivers will limit the withdrawal of a sizable proportion of the organisms within the area of influence,

---

[80] Final Rule at 65,275. "Design intake velocity" is the value assigned to the average speed at which intake water passes through the open area of the intake screen against which organisms might be impinged or through which they might be entrained. Final Rule at 65,339, §125.83.

[81] Id. at 65,274; 65,340, §125.84 (c) (1).

[82] Id. at 65,276.

[83] Id. at 65,340, §125.84 (c) (2) (iii).

commensurately reducing the entrainment of aquatic organisms.[84] The USEPA indicated that the optimal design requirement for location of a CWIS is in the area of the source waterbody "away from areas with the potential for high [spawning] productivity."[85]

3. Design and Construction Technologies

Facilities with a design intake capacity of more than 2 mgd but less than 10 mgd are not required to reduce the capacity of the CWIS to meet the requirements of the Final Rule.[86] However, they must install design and construction technologies for reducing entrainment.[87] The USEPA identified "a number of potentially effective design and construction intake technologies available for installation at [CWISs] for minimizing adverse environmental impact,[88] and the USEPA identified technologies that minimize impingement mortality and entrainment of all life states of fish, including wedge-wire screens and aquatic filter barrier systems.[89] As an example of an effective technology, the USEPA cited the Gunderboom at the Lovett facility, and noted that such a system "is entirely transferrable to a large, Midwestern river system."[90]

---

[84] Id. at 65,277.

[85] Id. at 65,276.

[86] Id. at 65,273.

[87] Id. at 65,275.

[88] Id. at 65,279.

[89] Id. at 65,279 - 65,280; see also id. at 65,280 n. 43.

[90] Id. at 65,280 n.43. The USEPA further acknowledged that the Lovett Gunderboom is now achieving "consistently greater than 80 percent reductions in entrainment and has the

Rather than establish a national performance standard for the technologies that minimize impingement mortality and entrainment, the USEPA requires only that an Applicant gather and present literature and available data on the proposed location and then select and install technologies that minimize impingement mortality and entrainment.[91] The Final Rule does not require the applicant to seek approval regarding which design and construction technologies it selects prior to the issue of its permit.[92] Rather, the Final Rule requires a determination of whether the design and construction technologies at the facility are minimizing impingement mortality and/or entrainment at the time of permit reissuance.[93]

4. Non-Aquatic Impacts

In addition to adopting national performance standards for CWISs, the USEPA has defined what is meant by "adverse environmental impacts" under CWA § 316 (b). The USEPA concluded that, on a national level, "the primary impacts of this rule will be aquatic in nature, and focus on impingement and entrainment affects [sic]."[94] However, the USEPA acknowledged that other, non-aquatic impacts may be considered at the local level in

---

potential to exceed 90 percent". Id.

[91] Id. at 65,275 - 65,276.

[92] Id.

[93] Id.

[94] Id. at 65,297.

determining what is BTA for the particular facility.[95] Such impacts may include plume visibility and air quality or energy impacts occasioned by the use of certain cooling technology.[96] Clearly, therefore, impacts that may be considered are not limited to those attributable to the CWIS.

B. Monitoring Requirements

The Final Rule includes monitoring and inspection schedules for all facilities.[97] The USEPA found that monitoring is entirely "appropriate" to ensure periodic maintenance.[98] Accordingly, the Final Rule requires biological monitoring for at least two years after the initial permit is issued, after which time less frequent monitoring may be implemented if the permittee can justify less frequent monitoring.[99] The regulations require that impingement sampling be conducted at least once a month and entrainment sampling be conducted at least biweekly during CWIS operation.[100] Also, the USEPA requires the monitoring of head loss across the intake

---

[95] Id.

[96] Id. The USEPA also determined that "visibility impacts from cooling towers, local climate change from wet cooling tower plumes, wildlife losses (e.g., birds colliding with towers)", among other impacts, "can be addressed through the use of Track II". Id. at 65,307.

[97] Id. at 65,307.

[98] Id.

[99] Final Rule at 65,343 - 65,344, §125.87 (a) (1)-(2). Monitoring must be performed consistent with the methods used for the Source Water Baseline Biological Characterization required in §122.21 (r) (3). See id. §125.87 (a).

[100] Id. § 125.87 (a) (1) - (2).

screens to determine if it correlates with the design intake velocity of the facility.[101] Lastly, the Final Rule requires inspection of all design and control technologies either visually or via a remote monitoring device to ensure compliance with the USEPA's regulations.[102] Data from each of these studies is to be used in subsequent permit applications to determine if additional or different technologies are required to minimize adverse impact.[103]

C. Reuse of Cooling Water

The USEPA determined that the reuse of cooling water is an effective means of complying with the requirements of CWA § 316 (b) and that reuse should be encouraged.[104] The Final Rule provides that facilities that are required to reduce flow intake to levels commensurate with closed-cycle cooling systems may meet the capacity threshold by reusing water withdrawn for cooling purposes:

> EPA considers the withdrawal of water for use and reuse as both process and cooling water analogous to the reduction of cooling water intake flows achieved through the use of a recirculating cooling water system.[105]

---

101 Id. § 125.87 (b).

102 Id. § 125.87 (c).

103 Id. § 125.89 (b) (1) (i).

104 Final Rule at 65,278. "EPA encourages such practices and, in turn, considers these techniques analogous to flow reduction for the purposes of meeting the capacity reduction requirements of this rule". Id.

105 Id.

Moreover, the USEPA indicated that reuse of the water for cooling purposes results in "considerable conservation of water and energy."[106]

D. USEPA Rejected Dry Cooling as BTA

In the Final Rule, the USEPA did not adopt dry cooling as the best technology available to minimize adverse impact.[107] The USEPA considered the option of adopting "national technology-based performance requirements for all waterbodies with a near-zero intake level (based on dry cooling)" and rejected it.[108] Instead, the USEPA has adopted a standard that requires reduction of intake capacity to a level commensurate with that which can be attained by closed-cycle recirculating wet cooling water systems.[109] The USEPA rejected dry cooling as BTA for several reasons, including: (1) additional costs; (2) energy penalty resulting from a loss of efficiency; and (3) increased air emissions.[110]

The USEPA concluded that requiring closed-cycle cooling systems as the primary regulatory standard would result in reductions in impingement and entrainment commensurate

---

[106] Id.

[107] Id. at 65,282 - 65,284.

[108] Id. at 65,270.

[109] Id. §125.84 (b) (1). It should be noted that facilities with design intake capacity of more than 2 mgd, but less than 10 mgd, such as Bowline Unit 3, are not required to comply with this standard. See id. § 125.84 (c).

[110] Final Rule at 65,282 - 65,284.

with the goals of Section 316 (b) of the Clean Water Act.[111] In addition, the USEPA found that other requirements of the Final Rule, such as velocity, proportional flow standards, and the implementation of proven design and construction technologies, may reduce entrainment by 70 to 95 percent and impingement mortality by more than 99 percent.[112] Accordingly, the USEPA determined that its "selected [scheme] is very effective in reducing impingement and entrainment . . . [and] that it is reasonable to reject dry cooling as a nationally applicable minimum in all cases".[113]

The USEPA did indicate that the Final Rule is not intended to restrict the use of dry cooling and that it may be appropriate for some facilities.[114] Examples of where it might be appropriate are "in areas with limited water available for cooling or waterbodies with extremely sensitive biological resources (e.g., endangered species, specially protected areas)."[115]

E. The Applicant's Hybrid Cooling is BTA Under Track I

As discussed above, new facilities with a design intake flow equal to or greater than 2 mgd but less than 10 mgd may choose to comply with the standards of Track I of the Final

---

[111] Id. at 65,284.

[112] Id.

[113] Id. (emphasis added).

[114] Id. at 65,282.

[115] Id.

Rule.[116] Bowline Unit 3 will be designed to withdraw up to 7.5 mgd.[117] Accordingly, the Track I standards are applicable to the Project. As set forth below, Bowline Unit 3 will comply with the Track I substantive requirements.

Pursuant to Section 125.84 (c) (1), each cooling water intake structure must be designed and constructed "to a maximum through-screen design intake velocity of 0.5 ft/s."[118] Bowline Unit 3 with a Gunderboom and 2.0 mm wedge-wire screen will comply with this requirement. Finding of Fact 28 correctly states that "[w]ater [at Bowline Unit 3 with a Gunderboom and 2.0 mm wedge-wire screens] would be withdrawn at a maximum through screen (inlet) velocity of 0.5 feet per second (fps)."[119] This design criterion applies to the through slot velocity of the proposed 2mm wedge-wire screen located behind the Gunderboom.[120] The approach velocity for the proposed Gunderboom, at a maximum flow of 7.5 mgd, will be much less than 0.5 fps, namely 0.0036 fps.[121]

Track I also requires that cooling water intake structures located in an estuary or

---

[116] Id. at 65,273, 65,340 - 65,341, §125.84 (c).

[117] R.D. at 48, Finding 12; Exh, 79, Draft SPDES Permit, at 8 of 15.

[118] Final Rule at 65,340, §125.84 (c) (1).

[119] R.D. at 50, Finding 28. In Finding of Fact 28, Hearing Examiner Casutto incorrectly states that "[t]he maximum flow through velocity for the Gunderboom curtain (at 7.5 mgd), would be approximately 1.4 feet per second (fps)." Id. However, as the Applicant, a more accurate description would be "the Gunderboom will have a design hydraulic loading rate of approximately 1.6 gpm/ft^2 of fabric at a maximum flow of 7.5 mgd." See Exh. 116.

[120] H. Tr. at 1447.

[121] Id. at 1447-1448.

tidal river have:

> the total design intake flow over one tidal cycle of ebb and flow must be no greater than one (1) percent of the volume of the water column within the area centered about the opening of the intake with a diameter defined by the distance of one tidal excursion at the mean low water level.[122]

Bowline Unit 3, with a proposed maximum water intake of 7.5 mgd, meets this requirement [123] Bowline Unit 3 has a total design intake flow over one tidal cycle of 0.006 percent.[124]

Also in compliance with Track I requirements, Bowline Unit 3 will implement design and construction technologies for minimizing impingement and entrainment of fish and shellfish.[125] In the Final Rule, USEPA identified technologies that minimize impingement mortality and entrainment of all life stages of fish, including wedge-wire screens and aquatic filter barrier systems, i.e., Gunderboom.[126] Bowline Unit 3 will utilize a Gunderboom and 2.0 mm wedge-wire screens to minimize impingement and entrainment. The USEPA Final Rule does not establish a specific reduction standard that must be achieved.

The location of Bowline Unit 3 cooling water intake system also is consistent with the USEPA design requirements. The USEPA has indicated that the optimal design requirement

---

[122] Final Rule at 65,340, §125.84 (c) (2) (iii).

[123] H. Tr. at 1447-1448.

[124] The methodology used to determine the total design intake flow is attached hereto as Appendix "A".

[125] See Final Rule at 65,340 - 65,341, §125.84 (c) (3), (4).

[126] Final Rule at 65,279; see also id., at 65,275, 65,280 n. 43.

for the location of a CWIS is in the area of the source waterbody "away from areas with the potential for high [spawning] productivity."[127] Finding of Fact 38 correctly states, "[p]rimary spawning areas of [the five fish species of concern], producing organisms more vulnerable to entrainment mortality, are found in other sections of the Hudson River, not Haverstraw Bay or Bowline Pond."[128]

Moreover, although the draft SPDES Permit allows the limited reuse of Bowline Units 1 and/or 2 discharged cooling water from October 1 through February 15, the DEC Staff has agreed that the Bowline Units 1 and/or 2 discharge stream should be utilized whenever it is available.[129] The reuse of the discharge from Bowline Units 1 and 2, whenever available, results in Bowline Unit 3 using the separate Bowline Unit 3 intake only for a very limited number of hours. In 2005, Bowline Unit 3 is predicted to utilize the new intake and draw water directly from Bowline Pond only during 608 hours of the year, or 6.9 percent of the time. In 2010, Bowline Unit 3 would be operating only 48 days when the Bowline Units 1 and/or 2 discharge would not be available.[130]

Lastly, the Applicant also agrees to comply with the monitoring and reporting

---

[127] Id. at 65,276.

[128] R.D. at 51, Finding 38.

[129] Id. at 12-13. Finding of Fact 67 is not correct because the Bowline Unit 3 intake will not be used when either Bowline Unit 1 or 2 is operating.

[130] Exh. 40 at 8-9.

requirements set forth in Sections 125.88 and 125.89 of the Final Rule.[131] As discussed more fully in Section D.6 of the Project Description, infra, a full and formal Bowline Unit 3 Gunderboom system operation monitoring program will be implemented. Moreover, regular monitoring, observations and response to warnings will be part of regular shift operations.[132] Further, in addition to routine visits and inspections, the manufacturer will monitor the operational data.[133]

POINT II

ALJ CASUTTO IMPROPERLY GRANTED RIVERKEEPER'S DISCOVERY MOTION

At the close of hearings (and later in its Initial Brief) Riverkeeper made a motion requesting an adverse inference about the performance of the Bowline Unit 3 fabric based on the movant's contention that the Applicant failed to provide the Gunderboom fabric to be used at Bowline Unit 3.[134] In the Recommended Decision, the Hearing Examiner found that Mirant had provided to Riverkeeper "the correct fabric intended for use in the Bowline Unit 3 Gunderboom."[135] Nevertheless, ALJ Casutto granted Riverkeeper's motion for an adverse

---

[131] See Exh. 79, SPDES Permit, at 10-12 of 15.

[132] H. Tr. at 1459.

[133] Id. at 1459-1460.

[134] RK Br. at 23-24; H. Tr. at 2432-2461.

[135] R.D. at 58, Finding 86.

inference against the Applicant.[136] Inasmuch as the Applicant complied with the discovery request, Riverkeeper's motion for an adverse inference should be denied.

As noted above, on the last day of the evidentiary hearings, Riverkeeper attorney David Gordon made a motion, pursuant to 6 NYCRR §624.7 (d)(2), for an adverse inference about the performance of the Bowline Unit 3 fabric "based purely on Discovery Sanction. Sanction for failure to comply with Discovery."[137] The Hearing Examiner reserved on the motion stating:

> I am not persuaded by what I've heard in oral argument today that the fabric -- that there was -- that the Applicant has provided you [Riverkeeper] with an incorrect sample or had misrepresented the sample in responding to the Discovery Request. But I'm reserving on the motion, and you can renew it in your closing brief.[138]

In its Initial Brief, Riverkeeper contended that the Applicant failed "to comply with a discovery request of Riverkeeper and Scenic Hudson for production of Gunderboom material to be used at the Bowline Facility."[139] Specifically, Riverkeeper asserted that in violation of the engineering specifications for the Bowline Unit 3 Gunderboom, Mirant provided Gunderboom fabric with "holes manufactured with widths of approximately 1 mm."[140] As such, Riverkeeper argued that "all inferences should be that the material to be used in the proposed

---

[136] Id. at 33, 68, Conclusion of Law 30.

[137] H. Tr. at 2435.

[138] Id. at 2452-2453.

[139] RK Br. at 23.

[140] Id.

facility will fail to adequately filter the water and aquatic organisms at the proposed facility."[141] In the Recommended Decision, Hearing Examiner Casutto found that the Applicant had provided Riverkeeper with Gunderboom fabric to be used at Bowline Unit 3 that accords with the "imprecise" hole size specification of the draft SPDES Permit.[142]

The record is clear that the Applicant complied with the discovery request. On May 21, 2001, in accordance with the "Ruling on Prehearing Motions," issued by Hearing Examiner Casutto on May 15, 2001, Mirant provided two 5.25 x 6 inch pieces of Gunderboom fabric to Riverkeeper in response to Information Request No. 375 (RK/SH-3) pursuant to terms and conditions set forth in a May 17, 2001 letter from Barbara S. Brenner to David K. Gordon and the clarifications set forth in a May 18, 2001 letter from David K. Gordon and Warren Reis to Barbara S. Brenner.[143] Thereafter, on June 4, 2001, pursuant to discussions with Riverkeeper and Scenic Hudson, Mirant provided Riverkeeper with a 42 x 32 inch piece of the Bowline Unit 3 Gunderboom fabric.

DEC regulations provide that "a failure to comply with the ALJ's direction

---

[141] Id. at 24.

[142] R.D. at 58, Finding 86 and 68, Conclusion of Law 29. The Hearing Examiner found that "the ASTM D-4751-99a AOS methodology is the only generally accepted standard . . . to evaluate fabric opening sizes." Id. at 33. See also, H. Tr. 2391, 2393, 2430-2431.

[143] Neither Riverkeeper's Motion nor the Recommended Decision identify either the discovery request at issue or the alleged faulty response thereto. The Applicant has assumed that the Hearing Examiner presumed that Riverkeeper's Motion pertains to Request No. 375. Information Request No. 375 states: "Please supply three (3) one-half meter squared (0.5 meters x 0.5 meters) pieces of the Gunderboom fabric that would be used at the Bowline three facility." Information Request No. 375 has not been offered into evidence and is not part of the record in this proceeding.

[regarding discovery] will allow the ALJ or the commissioner to draw the inference that the material demanded is unfavorable to the noncomplying party's position."[144] A plain reading of the regulation establishes that "a failure to comply" with a discovery directive is a condition precedent to drawing an adverse inference to a party's position. The imposition of an adverse inference is wholly inappropriate where a party has complied with the request for discovery.[145] Significantly, New York courts have held that "the fact that a party is dissatisfied with the answers proffered by another party is an insufficient basis upon which to conclude that the party willfully and contumaciously failed to comply with a court order compelling disclosure."[146]

Upon receipt of the Gunderboom material from the Applicant, Riverkeeper did not object in any way to the Gunderboom fabric provided nor seek to compel further disclosure pursuant to 6 NYCRR §624.7(d)(2). Rather, Riverkeeper accepted the Gunderboom fabric provided and proceeded with its testing.[147] Indeed, Riverkeeper failed to object to the Gunderboom material provided to it by the Applicant between the service of the discovery response on June 4, 2001 and the last day of the evidentiary hearings on September 7, 2001.[148] However, upon questioning by Hearing Examiner Casutto, Riverkeeper failed to provide any

---

[144] 6 NYCRR § 624.7 (d) (2).

[145] C.f. 44A N.Y. Jur. 2d Disclosure § 354.

[146] E.K. Construction Co., Inc. v. Town of North Hempstead, 144 A.D.2d 427, 427 (2d Dep't 1988), citing Miller v. Duffy, 126 A.D.2d 527, 528 (2d Dep't 1987).

[147] See Exh. 151 (PH-2).

[148] H. Tr. at 2432-2461.

valid reason for its delay:

> JUDGE CASUTTO: Then why wasn't there a motion in June 24th [sic]? Why wait until now to make that motion?
>
> MR. GORDON: Well, our -- our -- our studies commenced on June 20th, your Honor. At the time, two weeks before our studies, there was a tremendous amount of work being done to -- to commence the studies, and at the time we had no indication that this was going to be a problem.[149]

The Applicant has complied with all discovery requests. Therefore, the Commissioner must reverse the Hearing Examiner's grant of Riverkeeper's motion that "all inferences regarding flow in the fouling studies should be against the Applicant."

POINT III

THE HEARING EXAMINER'S CONCLUSION THAT THE GUNDERBOOM IS NOT A PROVEN TECHNOLOGY IS NOT SUPPORTED BY THE RECORD

The Hearing Examiner concluded that the Gunderboom is not a proven technology, stating that: (1) the Athens Interim Decision determined that the Gunderboom technology was unproven and experimental because the Commissioner held that the application of the Gunderboom technology was "premature" at the Athens site;[150] (2) there is "a substantial presumption that Gunderboom technology for CWISs remains an experimental technology"

---

[149] Id. at 2451-2452.

[150] R.D. at 16.

because it has not been deemed BTA for Lovett;[151] (3) ichthyoplankton studies indicate that the Lovett Gunderboom never achieved an exclusion rate of 75 percent or greater for a full deployment period;[152] (4) DEC Staff selectively interpreted the Lovett data;[153] (5) Lovett Gunderboom deployments showed effective filtering for periods of between four and six weeks, after which "for reasons not identified, effectiveness was severely compromised or in complete failure;[154] (6) biofouling is a contributing factor limiting the Gunderboom's effective exclusion to a period not exceeding between four and six weeks;[155] and (7) there is no evidence of the effectiveness of the Gunderboom fabric proposed for Bowline Unit 3.[156]

As demonstrated below, neither the Athens Interim Decision nor the record in this proceeding supports the Hearing Examiner's conclusion that the Gunderboom is an unproven and experimental technology. In fact, the USEPA, in issuing its Final Rule, cited to the Gunderboom at Lovett as an example of effective technology,[157] finding that the Lovett Gunderboom is now achieving consistently greater than 80 percent reductions in entrainment and

---

[151] Id. at 33.

[152] Id. at 55, Finding 60.

[153] Id., Finding 61.

[154] Id. at 57, Finding 75.

[155] Id. at 30.

[156] Id. at 34.

[157] Final Rule at 65,279 - 65,280; see also id. at 65,275, 65,280 n. 43.

has the potential to exceed 90 percent.[158]

A. The Athens Interim Decision Did Not Hold That Gunderboom is an Unproven and Experimental Technology

In the Athens Interim Decision, Commissioner Cahill clearly stated that "based on the record before me, the application of Gunderboom technology at this site is a bit premature."[159] Relying solely on the use of the word "premature" and disregarding the words "application" and "at this site," Hearing Examiner Casutto concluded, in the Recommended Decision, that Commissioner Cahill meant that, as of June 2000, the Gunderboom technology was unproven and experimental.[160] Then, based on this interpretation of the Athens Interim Decision, the Hearing Examiner stated that:

> The issue is whether, in view of Athens, the Gunderboom exclusion technology has advanced to the point that it is no longer experimental - - so that a Bowline 3 determination that Gunderboom technology is BTA would not be premature, as the

---

[158] Id. at 65,280 n. 43. See Technical Development Document for the Final Regulations Addressing Cooling Water Intake Structures for New Facilities, USEPA, Office of Water, (Nov. 9, 2001), at A-40 (stating that Gunderboom is a "proven technology" for the application at Lovett) ("Technical Document").

[159] DEC No.: 4-1922-0005/00001, In re Application for a State Pollution Discharge Elimination System (SPDES) Permit Pursuant to ECL Article 17 and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York by Athens Generating Co., Interim Decision (issued June 2, 2000), at 11 ("Athens Interim Decision") (slip opn) (emphasis added).

[160] R.D. at 16.

Commissioner deemed it to be in Athens.[161]

As set forth below, Commissioner Cahill's determination in the Athens Interim Decision is specifically limited to the record in that proceeding - - not to the state of development of the technology itself. Accordingly, Hearing Examiner Casutto's interpretation of the term "premature" is without merit and should be rejected.[162]

Nowhere in the Athens Interim Decision did Commissioner Cahill conclude that the Gunderboom technology is unproven or experimental. To the contrary, in the Athens Interim Decision, the Commissioner stated that "[t]he record indicates that a Gunderboom system....was successfully deployed in 1999 around unit 3 at the Lovett Generating Station located on the west shore of the Hudson River at Tompkins Cove, Rockland County, New York."[163] Moreover, he indicated that "[s]taff with direct experience with the Gunderboom testified that the Gunderboom technology is a proven technology."[164] And, he stated that "[t]he efficacy of the Gunderboom is supported by one successful deployment last year."[165] Thus, there is nothing in the Athens Interim Decision that supports the Hearing Examiner's conclusion that the Commissioner

---

[161] Id. at 21.

[162] In the Recommended Decision, Hearing Examiner Casutto requested that the Commissioner clarify whether the characterization "premature" in the Athens Interim Decision pertains to the configuration proposed in that case or whether it pertains to the state of development of the technology itself. Id. at 46.

[163] Athens Interim Decision at 10.

[164] Id.

[165] Id. at 11. That deployment, of course, was at Lovett.

considered the Gunderboom technology deployed at Lovett to be experimental or unproven.

Moreover, the Commissioner specifically noted that the successful 1999 application involved a different site (i.e. Lovett) and a different application of the Gunderboom technology than that proposed for the Athens generating facility. Hearing Examiner Casutto acknowledges that the proposed Bowline Unit 3 Gunderboom is similar to the Lovett Gunderboom and not the proposed Athens Gunderboom. Finding of Fact 50 in the Recommended Decision states:

> The Athens Gunderboom proposal was a different configuration than the Gunderboom configuration deployed at the Lovett facility. The Athens Gunderboom proposal included several unique and previously untested design elements. By comparison, the proposed Bowline Gunderboom design and configuration is similar to the Lovett design that has been under development since 1995.

In the Athens Interim Decision, Commissioner Cahill held that there was "insufficient evidence" in that record to conclude that the Gunderboom technology was suitable for the Athens project at that location.[166] He stated that there was "an abundance of information regarding deployment of the Gunderboom still needed from Athens Generating for consideration by the Department."[167] He identified the information that was missing from the record:

> Such information includes, inter alia, assorted drawings and schematics of the Gunderboom configuration and the facilities and structures to be installed as part of the Gunderboom system, descriptions of how deployment of the Gunderboom would take place, descriptions of the maintenance and support systems, a contingency plan in the event of failure and biological monitoring

---

[166] Id. (emphasis added).

[167] Id.

programs. The March 3, 2000 submission from Athens Generating contains only a 'concept design for a Gunderboom installation' and two drawings of that concept design.[168]

Significantly, in the Recommended Decision (Finding of Fact 51), the Hearing Examiner recognized that the type of information that was lacking in the Athens record is not lacking from the record in this proceeding:

> By comparison [with the Athens Gunderboom proposal], the Bowline Unit 3 Gunderboom proposal includes drawings and schematics of the Gunderboom configuration and the facilities and structures to be installed as part of the Gunderboom system, descriptions of how deployment of the Gunderboom would take place, descriptions of the maintenance and support systems, biological monitoring program and a contingency plan in the event of failure of the Gunderboom. The proposed Bowline Gunderboom will be smaller than Lovett (approximately 137 linear feet versus 500 linear feet), and will have less flow per unit area resulting in lower loading on the fabric and overall Gunderboom system than the Lovett system. Also, the Bowline Unit 3 Air Burst system (intended to clear clogged fabric pores) will be fully integrated into plant operations and the Bowline Unit 3 project will include a formal Gunderboom system operating monitoring program, neither of which exist at Lovett.[169]

The Hearing Examiner also stated that "[i]n view of the Athens Interim Decision, the present BTA analysis must include an evaluation of advances or events relevant to the development of Gunderboom technology that have occurred since June 2000 Athens Interim Decision."[170] This is based on his reading of the Interim Decision and the meaning he ascribed

---

[168] Id. (citation omitted).

[169] R.D. at 53-54, Finding 50.

[170] Id. at 16.

to "premature." There is additional information that post-dates the Athens Interim Decision pertaining to the efficiency of the Gunderboom in the record. The 2000 Lovett Study and the 2001 American Shad Impingement Study indicate that there has been further development in the Gunderboom technology that supports its deployment as BTA at Bowline Unit 3. The 2000 Lovett Study and the 2001 American Shad Impingement Study are discussed below.

Moreover, there is a significant difference between the Athens site and the Bowline Unit 3 site. The Athens site is located near spawning areas for the fish species of concern, with the exception of the Bay Anchovy.[171] In contrast, the Haverstraw Bay segment of the Hudson River at the Bowline site is not a significant spawning area.[172]

B. There is No Presumption that Gunderboom Technology is an Experimental Technology Because it Has Not Been Deemed BTA for Lovett

The Hearing Examiner stated that because the Gunderboom has not yet been deemed BTA for Lovett, "this fact alone creates a substantial presumption that Gunderboom technology for CWISs remains an experimental technology."[173] There is absolutely no support in law or fact for the Hearing Examiner's "presumption." First, the determination of BTA, as indicated in the Athens Interim Decision, is site specific. Thus, Gunderboom could be BTA for one site, but not BTA for another site. There is absolutely no evidence in this record that the

---

[171] Id. at 54, Finding 57.

[172] Id. at 54.

[173] Id. at 33.

Gunderboom technology has not been deemed BTA for Lovett because it is experimental.

Nor is there any support in the record for the Hearing Examiner's conclusion that because no CWIS Gunderboom project exists or has been designated BTA, the Gunderboom technology for CWIS fish exclusion remains an experimental technology.[174] Based on the Hearing Examiner's reasoning, no new technology would ever be designated BTA for any site. If it were always necessary to wait for a technology to be designated BTA at another site before it could be designated at an Applicant's site, it would be impossible to employ a new technology. Some site will always be the first site for any specific technology.

C. The Ichthyoplankton Exclusion Data Demonstrate that Gunderboom is a Proven Technology

The Hearing Examiner stated as a finding of fact that the Lovett ichthyoplankton exclusion data do not support the DEC Staff statement that the Bowline Unit 3 Gunderboom will have an effective exclusion rate of at least 80 percent.[175] The Hearing Examiner based his conclusion on his findings that: (1) for each of the three years when entrainment mitigation was evaluated at Lovett, a 75 percent (or greater) exclusion rate was never achieved for a full deployment period; and (2) the DEC Staff's interpretation of the Lovett data "is based upon a selective evaluation of the data."[176] As set forth below, the Hearing Examiner is incorrect.

---

[174] See id. at 22, 33-34.

[175] Id. at 55-56.

[176] Id. at 55.

1. The Lovett Gunderboom Had a Greater Than 75 Percent Exclusion Rate For the Duration of the Studies

Ichthyoplankton exclusion data were collected for three deployments at Lovett -- 1995, 1998 and 2000. The ichthyoplankton monitoring program consisted of simultaneous entrainment sampling at the Lovett Unit 3 intake, which was protected by the Gunderboom, and the unprotected Lovett Unit 4 intake. The Hearing Examiner found that the Lovett monitoring data do not demonstrate that the Gunderboom is effective because the exclusion rate of 75 percent or more never extended beyond a period of 4 to 6 weeks and was never achieved for a full deployment season.[177] The Hearing Examiner's conclusions pertaining to the ichthyoplankton data misconstrue the record evidence in this proceeding.

a. 1995 Lovett Study

In 1995, a single layer Gunderboom system was fabricated and deployed around the cooling water intake of Lovett Unit 3. The Gunderboom proposed for Bowline Unit 3 is a double layer Gunderboom System. Moreover, the Gunderboom system deployed in 1995 did not have an AirBurst system. Although there was ichthyoplankton sampling at Lovett in 1995,[178] DEC witness Radle cautioned that at that time the Lovett Gunderboom was a developmental

---

[177] Id. at 25-26.

[178] H. Tr. at 1865.

program.[179] Mr. Radle characterized 1995 as the early stages of a learning curve which was the basis for progressing to "a mature ready to deploy technology."[180]

The Gunderboom was deployed for a period of 37 days from June 23, 1995 until July 29, 1995.[181] The ichthyoplankton study covered virtually the entire deployment period from June 25, 1995 through July 29, 1995. Ichthyoplankton monitoring indicated an 82 percent reduction in entrainable organisms at Lovett Unit 3 compared to the unprotected Lovett Unit 4.[182] The 82 percent effectiveness level was achieved, notwithstanding the fact that it was estimated that by the end of this study, all of the Lovett Unit 3 cooling water was spilling over the top (i.e. no water being filtered).[183] Thus, even though the design, in 1995, had several features which have subsequently been refined, the Gunderboom was still effective for the entire deployment period.

b. 1998 Lovett Study

The 1998 ichthyoplankton monitoring study was a one month entrainment sampling program that was conducted coincident with the Gunderboom deployment at Lovett

---

[179] Id. at 1921.

[180] Id.

[181] Exh. 146 at 1-1.

[182] H. Tr. at 1786; Exh. 148 at 3.

[183] Exh. 148 at 3.

Unit 3.[184] The report on the 1998 ichthyoplankton monitoring study states that "[t]he results of this sampling demonstrated a greater than 80 percent reduction in the density of entrainable organisms entering the cooling water system attributable to the Gunderboom system."[185] In utilizing the 1998 program results, DEC witness Radle recognized that:

> [T]he sole purpose of the 1998 program was not to see how high a number we could get in entrainment reduction. There were other program goals during this year and one of those program goals was to reduce the frequency of cleaning so that we understood how quickly a boom would blind.[186]

In fact, no maintenance was performed towards the end of the study in order to determine untended behavior of the Gunderboom system.[187] The Gunderboom that has been proposed for Bowline Unit 3 will not be "untended." Moreover, the 1998 Gunderboom was equipped with a manually operated AirBurst system, not an automated system, whereas the Bowline Unit 3 Gunderboom system will have a fully automated AirBurst System.

c. 2000 Lovett Study

The 2000 Lovett study, contrary to the finding of the Hearing Examiner, had an ichthyoplankton exclusion rate that exceeded 75 percent. Overall, the Lovett Unit 3 to Lovett Unit 4 ichthyoplankton index was 82 percent, i.e. 82 percent fewer ichthyoplankton were

---

[184] Id.

[185] Id.

[186] H. Tr. at 1903-1904.

[187] Id. at 2133; Exh. 147 at 2.

collected at the Gunderboom protected Lovett Unit 3 intake than at the unprotected Lovett Unit 4 intake.[188] The key fact is that the Gunderboom consistently yielded better or lower entrainment numbers over the test period.[189]

The 82 percent exclusion rate was achieved notwithstanding some circumstances that were unique to the Lovett deployment that adversely influenced the results of the effectiveness of the monitoring program. Circumstances were encountered during the 2000 Lovett Unit 3 Gunderboom deployment that likely resulted in the introduction of eggs and larvae behind the deployed Lovett Unit 3 boom.[190]

These circumstances resulted from the plant configuration and layout at Lovett and cannot occur at Bowline Unit 3. The unscreened discharge pipes from Lovett Unit 4 actually were discharging into the Lovett Unit 3 Gunderboom protected area.[191] Although plankton nets were placed over the ends of two pipes discharging behind the Gunderboom,[192] the ichthyoplankton nets periodically broke and allowed the discharge of ichthyoplankton that entered the facility through Lovett Unit 4 into the area surrounded by the Lovett Unit 3 Gunderboom.[193] Because of the design of the Bowline Unit 3 intake and the physical locations

---

[188] Exh. 115 at 2-16.

[189] H. Tr. at 1487.

[190] Exh. 115 at 2-18.

[191] H. Tr. at 1498.

[192] Exh. 115 at 2-18.

[193] H. Tr. at 1498-1499.

of the Bowline Units 1, 2, and 3 discharges, this could not occur at Bowline Unit 3. Indeed, all the Bowline units discharge into the Hudson River, not Bowline Pond.

Additionally, during the deployment of the Lovett Unit 3 Gunderboom, adult white perch were trapped inside the Gunderboom itself.[194] Thus, there was spawning activity occurring within the area protected by the Gunderboom which elevated some white perch numbers early in the ichthyoplankton entrainment monitoring program.[195] Any spawn produced inside the boom would add to the numbers collected in entrainment samples at Lovett Unit 3, decreasing its apparent mitigative capability.[196]

2. The DEC Staff Did Not Selectively Interpret the Monitoring Data

The Hearing Examiner rejected the results of the three years of ichthyoplankton exclusion data, stating that absent "selective" interpretation of the monitoring data, the Gunderboom has not "reliably and consistency achieved such a high claimed exclusion percentage."[197] As set forth above, the reported effectiveness rates for the 1995, 1998, and 2000 Lovett studies were based on the data collected during the studies for each of those years. As demonstrated below, there was not a selective evaluation of the data.

---

[194] Id. at 1499, 1791-1792; Exh. 115, Attachment B at 4.

[195] H. Tr. at 1499, 1791-1792; Exh. 115, Attachment B at 4.

[196] H. Tr. at 1792.

[197] R.D. at 55, Finding 62.

a. 1995 Lovett Study

The Hearing Examiner faults the DEC Staff's interpretation of the 1995 Lovett data, stating "approximately 25% of the days DEC Staff included for comparison have little or no data for the non-Gunderboom intake."[198] This statement is not supported by the record. Table 5-9 of Exhibit 146 -- the "Lovett Generating Station Gunderboom Evaluation Program 1995" -- indicates that there is data for every day of the study for Lovett Unit 4, which is the non-Gunderboom study.

Perhaps, in his Recommended Decision, the Hearing Examiner meant to reference the six days during the ichthyoplankton monitoring program that Lovett Unit 3 is listed as "off line." The issue of the days that Lovett Unit 3 was off-line, as well as low-flow days, was addressed on the record. When cross-examined about the six days during the monitoring program that Lovett Unit 3 is listed as off-line, DEC witness Radle testified that he could not state what the effects would be of eliminating these days, or other low-flow days, from the data "[w]ithout running the numbers."[199] Subsequent to the hearings, utilizing information that is in the record, the DEC Staff performed a calculation, excluding the data from any day when either Lovett Unit 3 or Unit 4 was not drawing full-flow.[200]

The information utilized in preparing the calculations was taken from Table 5-9

---

[198] Id. at 26.

[199] H. Tr. at 1882.

[200] DEC Initial Br. at 27-28.

of Exhibit 146. Mr. Radle performed the calculation by comparing the number of fish killed per unit of volume. Eliminating the days when there would not be an "apples to apples" comparison, the DEC Staff calculation indicated that the exclusion rate improves to 91.3 percent.[201] Thus, DEC Staff's interpretation of the Lovett data for 1995 was not, in fact, based on a selective interpretation of the data. As it demonstrated by the DEC Staff calculation, based on the information in the record, a selective comparison of the data, in which some of the data are disregarded, yielded a higher, not a lower, exclusion rate.

b. The 1998 Lovett Study

As indicated above, the report on the 1998 ichthyoplankton exclusion monitoring study indicates that the exclusion rate was greater than 80% for the study, notwithstanding the fact that one of the goals of the study was to determine the behavior of the system if no maintenance was performed. Nonetheless, the Hearing Examiner states that:

> In 1998, the Gunderboom was deployed for a period of 12 weeks. But, Mirant and DEC Staff rely only upon a 4-week period for their conclusion that the Gunderboom operated at 76% effectiveness for exclusion.[202]

The fact that the Gunderboom was deployed for more than a 4-week period does not support the conclusion that the Mirant and DEC Staff reliance on a 4-week period was "selective." The Lovett 1998 Study report relied on the results of the one month study, stating

---

[201] Id. at 27.

[202] R.D. at 55, Finding 63.

that "a one-month entrainment sampling program was conducted coincident with system deployment."[203] Thus, it is that one-month entrainment sampling program upon which the DEC Staff and Mirant relied and that sampling demonstrated a greater than 80 percent reduction.[204] In fact, despite the goal of reducing the frequency of cleaning, the study demonstrates that the entrainment densities at Bowline Unit 3 with a Gunderboom were lower than Bowline Unit 4.[205]

c. 2000 Lovett Study

The Hearing Examiner stated, in Finding of Fact 65, that:

> For the year 2000 Lovett deployment, the 80% effectiveness claimed by Mirant and DEC Staff pertains only to the three initial weeks of the deployment season. After six weeks of operation, effectiveness began to decline and by the end of July, the Gunderboom was not effective in exclusion of aquatic biota.[206]

As indicated above, the overall exclusion index was 82 percent for the entire period of the 2000 Lovett study, from May 11, 2000 through August 24, 2000. This is not based on a selective interpretation of the data, but rather on all of the data obtained during the study. What the Hearing Examiner appears to consider to be a selective interpretation of the data is the DEC Staff testimony that a comparison of the small numbers is not as reliable an indicator of the success of the Gunderboom as an analysis of the data obtained during the earlier part of the study when

---

[203] Exh. 147 at 1.

[204] Exh. 147 at 1.

[205] Exh. 147 at Figure 9; H. Tr. at 1903-1904.

[206] R.D. at 55-56.

the densities were far greater.[207] In fact, the Riverkeeper witnesses agreed that differences between small numbers do not have the same significance as the differences between large numbers. Riverkeeper witness Huddleston testified as follows:

> Q. And, in evaluating the importance of any numbers relating to entrainment sampling events, would you accord the same statistical significance to small differences in small numbers as to large differences in large numbers?
>
> A. I'm not sure I understand the question. Could you read it back?
>
> Q. Well, hypothetically, if there are two numbers, say 680 and 430 - so they differ by the number 250 - - and you had the number 6,800 and 4,300, which differ by 2,500, would you accord the same statistical significance to both sets of numbers?
>
> A. No, I haven't --
>
> MR. GORDON: Your honor, I object.[208]

Although, following Mr. Gordon's objection, Mr. Huddleston indicated that he was not a statistician and would not "feel comfortable answering that question,"[209] it is clear from the record that he had answered the question in the negative.

Moreover, Riverkeeper witness Huddleston was asked specifically to look at the numbers for June 8 in Exhibit 115 -- the 2000 Lovett report. He was asked whether the

---

[207] Id. at 29.

[208] H. Tr. at 2292.

[209] Id. at 2294.

difference between 681.8 and 437.8 was "a large difference."[210] His answer was "[n]o, not when you're talking aquatic organisms."[211] Riverkeeper witness Henderson also testified that insofar as the data for late July and August 2000, which are set forth in Exhibit 115, the small numbers "cannot be studied, statistically, as a ratio."[212]

The Hearing Examiner stated that "DEC Staff never explained why the proportional exclusion rate would not continue, even at lower densities. Nor did Staff identify a density below which the results would be predictably unreliable."[213] However, the DEC Staff was never asked by the Hearing Examiner at the hearings for the explanation or to identify such a density.

3. The Radle 2001 Study Demonstrates that the Gunderboom is a Proven Technology

In the Recommended Decision, the Hearing Examiner recognized that the 2001 American Shad Impingement experiments conducted by DEC biologist Radle "supports a conclusion that adverse impacts of the Gunderboom related to impingement mortality would be de minimis."[214] Specifically, the Hearing Examiner found that "[t]he results of the experiments

---

[210] Id. at 2297.

[211] Id.

[212] H. Tr. at 2358.

[213] R.D. at 26.

[214] Id. at 28.

suggest that the mortalities that did occur were reflective of the natural random mortality that occurs independent of the test conditions."[215] The Hearing Examiner appeared to ignore this study when he concluded that Gunderboom is not a proven technology. The Hearing Examiner's finding is inconsistent with the conclusion that the Gunderboom is not a proven technology.

D. The Lovett Reports Address the Problems Encountered During the Ichthyoplankton Studies

The Hearing Examiner stated that the Applicant did not identify the reasons that the Lovett Gunderboom deployments' effective filtering was "severely compromised or in complete failure" after periods of more than four to six weeks.[216] As demonstrated below, the Lovett reports identify problems that occurred during the Lovett deployments and demonstrate that any problems encountered in the developmental stage of the Gunderboom have been addressed. The Lovett reports also demonstrate that the 1999 and 2000 deployments were successful. Thus, the record does not support the Hearing Examiner's conclusion that the Lovett Gunderboom deployments' effective filtering was "severely compromised or in complete failure."

1. 1995 Gunderboom Deployment

The Gunderboom technology initially was developed to prevent the migration of

---

[215] Id. at 56, Finding 70.

[216] Id.

particulates, such as suspended sediments, from dredging or storm-water flow. For the years 1994 through 1998, the deployments at Lovett were utilized to evaluate the efficacy of the Gunderboom technology to prevent fish egg and larval entrainment in a once-through generating station cooling water intake system.[217] During 1994 through 1998, several features of the Gunderboom system were refined, including the anchoring system; the design of the connections (e.g., mooring lines); and the design and use of non-permeable fabric "skirts" extending inward and outward from the boom to ensure an effective seal with the river bottom. Especially important was the development and refinement of the AirBurst system and its automated operation.[218]

The evaluation of the Gunderboom system as a means of lowering ichthyoplankton entrainment was initiated in 1994 with small-scale tests to obtain some preliminary information on filtering capacity and the potential for fabric clogging.[219] Subsequent to the preliminary filtering tests, a single layer Gunderboom system was fabricated and deployed around the cooling water intake of Lovett Unit 3 during 1995. The single layer Gunderboom was maintained at the Lovett Unit 3 intake for approximately one month.[220]

Contrary to the Hearing Examiner's finding, the 1995 Lovett Report did identify the problems that occurred during the 1995 ichthyoplankton study. The 1995 Lovett Report

---

[217] H. Tr. at 1453.

[218] Id. at 1453-1454.

[219] Exh. 115 at 1-1.

[220] See id.

indicated that there was "[s]ediment buildup on the boom and probably within the boom fabric" and that this created a substantial problem in terms of filtration.[221] The divers reported fine sediment adhering to the surface of the boom at the first dive inspection on June 27, approximately four days after full boom deployment. The condition was noted over the entire length of the boom, from surface to bottom. In addition, the Gunderboom was overtopped within 12 hours of full deployment and this condition persisted during the testing period any time that the Lovett Unit 3 circulating water pumps were operating.[222] The percentage of the boom that was submerged (overtopped) increased as the deployment period progressed.[223] Moreover, several of the anchor and support line attachment loops failed shortly after deployment.[224]

The 1995 Lovett Report indicated, also, that there was a temporary loss of the wooden barrier blocking the open space between the plant bulkhead and the mooring dolphin.[225] The report concluded that insofar as determining the biological effectiveness of the Gunderboom, that:

> The difference in fish impingement between the two units [Lovett 3 and Lovett 4] may have been greater (possibly indicating greater effectiveness of the Gunderboom system) as aquatic organisms had

---

[221] Exh. 146 at 5-6.

[222] Id. at 5-7.

[223] Id. at 6-1.

[224] Id.

[225] Id. at 6-3.

> access to the Unit 3 intake area due to the temporary loss of the wooden barrier blocking the open space between the plant bulkhead and the mooring dolphin. Even with the potential bias to the biological data due to the loss of the blocking structure, impingement data indicate that the Gunderboom effectively limited fish access to the Unit 3 intake area.[226]

These problems were addressed in subsequent deployments. As indicated, supra, the 1995 Gunderboom was a single-layer curtain with no AirBurst cleaning system. After the 1995 Lovett study, Gunderboom designed a two-layer system for deployment around the Lovett unit.[227] In addition, the 1996 Lovett Gunderboom was equipped with a manual AirBurst Cleaning System.[228] During 1997, additional studies were conducted to develop a deadweight boom anchoring system compatible with the bottom sediment conditions at Lovett. The new anchor system was shown to be effective at maintaining the boom in position around the Lovett Unit 3 cooling water intake.[229] Moreover, the AirBurst cleaning system has been refined.

2. 1998 Gunderboom Deployment

The Gunderboom that was deployed at Lovett in 1998 included several refinements based on previous deployments. The new Gunderboom that was deployed at the

---

[226] Id. at 6-2 to 6-3.

[227] Exh. 115 at 1-1.

[228] Id.

[229] Id.

Lovett Unit 3 intake structure on June 11, 1998 had two-ply fabric,[230] with holes in both the front (upstream) and back (downstream) layer of material to allow sediment particles to pass through the boom.[231] The boom also was equipped with a manually operated AirBurst cleaning system.

The 1998 Lovett Report clearly states that "toward the end of the study, no maintenance was performed to determine untended behavior of the system."[232] Thus, the report clearly indicates the reason that the Gunderboom system was more effective at the beginning of the study then at the end of the study. Moreover, the report states that overall periodic underwater inspections indicated that the Gunderboom operated properly. The boom material was in good condition, the AirBurst cleaning system effectively maintained the filtering capacity of the Gunderboom material, and a good seal existed around the entire boom.[233]

3. 2000 Gunderboom Deployment

As set forth, supra, the 2000 Lovett Report indicates that an 82 percent exclusion rate was achieved even though some circumstances adversely affected the results of the monitoring program. In particular, there was an unscreened discharge pipe from Lovett Unit 4

---

[230] Id. at 1-3.

[231] See H. Tr. at 1789.

[232] Exh. 147 at 2.

[233] Exh. 115 at 1-3.

that was discharging into the Lovett Unit 3 Gunderboom protected area.[234] Thus, ichthyoplankton were being discharged behind the Lovett 3 Gunderboom by the Lovett Unit 4 unscreened pipe. Moreover, during the deployment of the Lovett Unit 3 Gunderboom, adult white perch were trapped inside the Gunderboom itself. Consequently, any spawning activity within the protected area artificially would reduce the rate of effectiveness of the Lovett Unit 3 Gunderboom.

Neither of the problems indicates that the Gunderboom is an unproven technology. These circumstances are unique to the Lovett deployment and can not occur at Bowline Unit 3 because of differences in system configuration and plant layout. Because of the design of the Bowline Unit 3 intake and the physical locations of the Bowline Units 1, 2 and 3 discharges, the units could not discharge behind the Bowline Unit 3 discharge. All the Bowline Units discharge into the Hudson River, not Bowline Pond, where the Bowline Unit 3 Gunderboom would be deployed.

As to the trapping of adult fish inside the Gunderboom itself, the Gunderboom was deployed at Lovett Unit 3 on May 10, 2000.[235] The Gunderboom at Bowline Unit 3, in accordance with the conditions set forth in the draft SPDES draft permit, will be deployed on February 15 of each year. By deploying the Gunderboom three months earlier than the date on which the Lovett Gunderboom was deployed in 2000, the draft SPDES permit addresses this

---

[234] H. Tr. at 1498.

[235] Exh. 115 at 2-16.

issue.[236]

The Lovett 2000 Report identifies other problems that occurred. There was an accidental shut off of the air purge system on June 6-7 which resulted in overtopping of the boom.[237] On two occasions (July 13 and August 9) the air compressor was determined to be inoperable. These problems correspond very closely to higher ichthyoplankton density during periods at Lovett Unit 3 compared to Lovett Unit 4.[238]

These problems were primarily the result of failures in the air supply which was provided by a temporary system, unlike the one proposed for Bowline Unit 3.[239] The Lovett AirBurst system was not formally integrated into plant operations and did not have warning lights, audible alarms or a backup system. Although problems with the air compressor at Lovett resulted in short duration loss of boom filtering capacity, it is important to recognize that the problem was with the air compressor, not the AirBurst system. When the air compressor problems were fixed, the AirBurst system quickly returned the boom to its full filtering capacity.[240]

---

[236] See Exh. 40 at 8-9.

[237] Exh. 115 at 2-18.

[238] Id.

[239] H. Tr. at 1458.

[240] Id.

E. Biological Growth Will Not Affect the Bowline Unit 3 Exclusion Efficiency

Despite his acknowledgment that both Mirant and DEC Staff presented credible criticisms of the Riverkeeper's test, including the fact that the studies did not reflect the effectiveness of the AirBurst cleaning system that is designed for a fully deployed Gunderboom,[241] the Hearing Examiner found that the test of the Gunderboom fabric performed by Pisces during a 29 day period ("Riverkeeper test") and the simultaneously performed Flow Tank Apparatus ("FTA") test "provide credible evidence suggesting that biofouling is a contributing factor limiting the Gunderboom's effective exclusion to a period not exceeding between four and six weeks."[242] Based on that finding, the Hearing Examiner held that the Riverkeeper and the FTA tests are relevant to an assessment of the functioning of a fully deployed Gunderboom over a period exceeding seven months.[243]

As set forth below, the Hearing Examiner's reliance on the results of the tests is misplaced. He acknowledges that both Mirant and DEC Staff presented credible criticisms of the studies.[244] The relevant information on the effect of biological growth on a fully deployed Gunderboom is not the results of the Riverkeeper test, but rather the fact that biological growth has not impacted negatively the effectiveness of the Lovett Gunderboom.

---

[241] Id.

[242] R.D. at 30.

[243] Id.

[244] Id.

1. The Riverkeeper and FTA Tests Were Not Designed to Determine the Effectiveness of a Deployed Gunderboom

The Riverkeeper test was not designed to test the effectiveness of a fully deployed Gunderboom, but rather to: (a) determine if Gunderboom material is subject to biological growth; (b) determine the nature of any biological community; and (c) determine the rate of fouling of the material.[245] A test designed to determine the rate of biological growth on static panels is not a test designed to determine whether a deployed Gunderboom would fail because of biological growth. Rather, the test examined only whether, under very limited conditions, there would be biological growth on small pieces of Gunderboom fabric.

Although the Hearing Examiner recognized that that test did not reflect the operation of the AirBurst system of a fully deployed Gunderboom, he discounted some of the Applicant's criticisms of the studies, stating "the fact that Mirant did not challenge Riverkeeper's study design before the study was implemented, and to the contrary, participated by conducting its own simultaneous FTA study, weakens the credibility of Mirant's criticisms."[246] However, the Hearing Examiner's statement is incorrect.

When Riverkeeper sought intervenor funding for its test, the Applicant specifically stated in a letter to the Hearing Examiner that "it does not agree with several statements about

---

[245] H. Tr. at 1525-1526; <u>see</u> <u>also</u> Exh. 151.

[246] R.D. at 29-30.

Gunderboom," which were included in Riverkeeper's protocol for the test.[247] And, the DEC Staff expressed "reservations about the value of the results of the proposed [Riverkeeper] study."[248] DEC Staff specifically stated that the results of the "proposed study of Gunderboom material alone would be irrelevant as the Bowline Unit 3 Gunderboom would employ the Air-Burst system."[249] DEC Staff also cautioned that "any Air-Burst system used in a study should be comparable to the one that would be used at Bowline Unit 3" for the results of the test to be relevant.[250]

a. The Riverkeeper Test

The Riverkeeper test was not representative of the performance of a Gunderboom in Bowline Pond because it failed to simulate the physical configuration and operating characteristics of a fully deployed Gunderboom. A fully deployed Gunderboom utilizing the Air Burst system incorporates both the movement of the fabric curtain and the rippling effect of the bubbles as integral elements of the system. Instead of simulating an actual operating Gunderboom, the Riverkeeper limited testing to a series of static panels of Gunderboom fabric.

---

[247] Letter from Barbara S. Brenner to Presiding Examiner Gerald L. Lynch and Associate Examiner Kevin J. Casutto, Case No. 99-F-1164, dated June 18, 2001.

[248] Case No.: 99-F-1164, Application by Mirant Bowline, L.L.C. (Formerly Southern Energy Bowline, L.L.C.) for a Certificate of Environmental Compatibility and Public Need to Construct and Operate Bowline Unit 3, a 750 Megawatt Generating Facility in the Town of Haverstraw, Rockland County, Intervenor Funding Order, (issued June 25, 2001), at 2-3.

[249] Id.

[250] Id.

As stated in the test report, which is Exhibit 151, testing was conducted on "static panels through which no water was pulled and which were not subject to air burst cleaning."[251] Gunderboom fabric panels that were 5 inches by 4 inches in size were fixed to stainless steel plates with a hole cut in the center.[252] Spacers and bolts were used to attach the plates together in pairs.[253] A neoprene sleeve was attached to stop light penetration between the plates. Six ropes were hung in front of the power station intakes in Bowline Pond with three plates positioned, vertically, on each rope at 3, 9, and 15 feet from the surface.[254]

The Hearing Examiner recognized that unlike the static panels, the Bowline Unit 3 Gunderboom will be a full-water-depth flexible barrier suspended between the water's surface and the water body floor.[255] The flexibility of the Gunderboom panels is a significant feature of a deployed Gunderboom which is totally inconsistent with Riverkeeper's test protocol.[256] Moreover, the Bowline Unit 3 Gunderboom also will have an AirBurst system.[257] Consequently, given the static nature of the panels and the absence of an AirBurst system, in contrast to a fully deployed Gunderboom, the static panels were not subject to the billowing of a fully deployed

---

[251] Exh. 151 (PH-2) at 2.

[252] Exh. 138 (CMS-2); Exh. 151 (PH-2) at 3.

[253] Exh. 151 (PH-2) at 3.

[254] Id.

[255] R.D. at 13-14.

[256] See H. Tr. at 1595-1601.

[257] See Exh. 116.

Gunderboom curtain.[258]

The Riverkeeper test is limited to the nature of biological growth on small, static sections of Gunderboom material. The Riverkeeper test fails to take into account the fact that the Gunderboom will be significantly larger and subject to the AirBurst system, as well as the Applicant's monitoring plan. Accordingly, any conclusions about the effectiveness of a deployed Gunderboom system that are based on the results of the Riverkeeper test must be rejected.

A fundamental flaw in the design of the Riverkeeper test was that it did not even address the issue of whether biological growth would cause a structural failure of a deployed Gunderboom.[259] The fact that biological growth occurred on the Riverkeeper's test panels was consistent with past experience, as well as the expectation that any non-toxic fabric would evidence such growth.[260] As the Recommended Decision acknowledges, biological growth has occurred at the Lovett Gunderboom. However, it has never been identified as a cause of failure.[261]

---

[258] See H. Tr. at 1595-1601.

[259] Id. at 2340-2341.

[260] Id. at 56, Finding 71.

[261] R.D. at 30.

b. The Flow Tank Apparatus ("FTA") Test

The Hearing Examiner found that the FTA test is relevant to an assessment of the functioning of a fully deployed Gunderboom.[262] However, his conclusion is inconsistent with his finding that the AirBurst system utilized in the test did not function like an AirBurst system functions in a fully deployed Gunderboom.[263] In addition, Finding 81 states that:

> Mirant's panels were in a device (the FTA) that to some extent shielded the panels from predator communities that otherwise would be expected to reduce or slow the colonization of a fully deployed Gunderboom.[264]

The FTA was designed to test different flow rates on Gunderboom fabric. It was not designed to test the fabric's ability to retard biological growth or to test the effectiveness of the AirBurst cleaning system.[265] As the Hearing Examiner recognized, the design of the tank and the mounting of the fabric within the tank demonstrate that it was not designed to simulate the performance of a deployed Gunderboom.[266]

The FTA consists of an aluminum inner tank with submersible pumps and an outer

---

[262] R.D. at 30.

[263] Id. at 58, Finding 80.

[264] Id., Finding 81.

[265] H. Tr. at 1528.

[266] R.D. at 29.

tank that is open to the local water body through eight 1-ft diameter ports.[267] The top of the tank is open and has a perimeter flotation collar allowing the FTA to float in the water with about 8 inches of free board. The inner tank is open to the outer tank on one end where a an 8-ft^2 piece test fabric was placed in a metal frame for testing.[268] When placed in the FTA, the test panel seals the inner tank from the outer tank allowing only water passing through the fabric to exit the inner tank.[269]

Significantly, the FTA reaches a depth of only approximately 4 feet, whereas a fully deployed Gunderboom in Bowline Pond would reach depths greater than 20 feet.[270] Because the AirBurst system works by releasing bubbles at the base of the Gunderboom fabric, the depth of the FTA does not allow for the proper functioning of the AirBurst system. In actual deployment, the air bubbles will expand with the decrease in pressure as they rise through the water column,[271] causing a deployed Gunderboom to shake and billow, dislodging sediment from the Gunderboom fabric.[272] As the Hearing Examiner found, the AirBurst system in the FTA does not work like a deployed Gunderboom because:

> An essential effect of the AirBurst system is the billowing effect

---

[267] H. Tr. at 1527; Exh. 139 (CMS-3).

[268] H. Tr. at 1527.

[269] Id.

[270] Id. at 1529; Exh. 116.

[271] H. Tr. at 1529.

[272] Id. at 1529, 1595-1596.

> it has upon the fully deployed Gunderboom curtain, but that in the 29-day studies, this billowing effect did not occur because the fabric samples were too small and also because they were secured to a frame that precluded billowing.[273]

The result is that the shaking and billowing effects that occur at deeper depths in a deployed Gunderboom did not occur in the FTA.[274]

The FTA also created an unrealistically extreme environment for possible biological growth because the test was run in highly productive surface waters (i.e. less than four feet deep), whereas most of the Gunderboom would be deployed below this zone.[275] The highest potential for biological growth occurs in the upper photic zone of an aquatic system.[276] As the Hearing Examiner acknowledged, the tests do not support the conclusion that biological growth will continue unabated on the Gunderboom.[277] In addition, the Hearing Examiner recognized that the static panels in the FTA were "isolated from factors like predation that could easily have cropped members of the communities that were observed growing in the protected environment within the FTA."[278]

---

[273] R.D. at 58, Finding 80.

[274] H. Tr. at 1595-1596.

[275] Id. at 1528, 1625.

[276] H. Tr. at 1528.

[277] R.D. at 30.

[278] Id. at 1596.

2. The Results of the Riverkeeper Test If, Arguendo, They Are Relevant Do Not Demonstrate That Biological Growth Will Limit the Effectiveness of the Bowline Unit 3 Gunderboom

Notwithstanding his recognition of the flaws in the design of the Riverkeeper and FTA tests, the Hearing Examiner concluded that "[t]hese studies do provide credible evidence suggesting that biofouling is a contributing factor limiting the Gunderboom's effective exclusion to a period not exceeding between four to six weeks."[279] The Hearing Examiner's conclusion is contrary to Finding 82 that "[t]hroughout the 29 days of the Riverkeeper and FTA studies, the Gunderboom fabric samples provided a flow of at least 5 gallons/min/sq. ft.," which is within the design criteria.[280] It also is contrary to the Hearing Examiner's conclusion that "Mirant and DEC Staff persuasively refute [Riverkeeper's] assertion that biological growth on the Gunderboom will continue unabated."[281]

As set forth more fully below, although the design of the Riverkeeper and FTA tests renders the results inapplicable to a deployed Gunderboom, if, arguendo, the results were considered to be relevant to whether a Gunderboom system deployed in Bowline Pond would fail because of biological growth, the test results do not support the Hearing Examiner's conclusion that biological growth would limit the effectiveness of the Gunderboom. The static

---

[279] R.D. at 30.

[280] Id. at 58, Finding 82.

[281] Id. at 30.

panel testing results clearly indicate that the reduced flow rate resulting from biological growth will not reduce flow rates such that the Gunderboom system will fail to perform within the design levels of the Gunderboom system.[282]

a. Biological Growth Did Not Result in the Unit Flow Rate Exceeding the Design Parameter

The Hearing Examiner accepted Riverkeeper's testimony that the permeability of the panels was reduced so that "the panels were 62% less permeable than they were at the beginning of the test period."[283] This finding is based on the testimony of Riverkeeper witness Henderson that after 29 days of exposure, average flow through the static test panels suspended in Bowline Pond was reduced to 8.35 mm/sec, which is 38 percent of the flow through clean material.[284] However, even if the flow is slowed to 38 percent of that through clean fabric, the Bowline Unit 3 Gunderboom still will function effectively because the biological growth would not restrict flow to the point where structural failure could occur.[285] In fact, the Hearing Examiner found that the reduced unit flow rate through the test panels would still be "at least 5

---

[282] Id. at 58, Finding 82; H. Tr. at 1623.

[283] R.D. at 57, Finding 74.

[284] H. Tr. at 2319.

[285] R.D. at 30, 58, Finding 82.

gallons/min/sq.ft."[286] This is within the design criterion and well above the Bowline Unit 3 maximum anticipated operating conditions of 1.6 gpm/ft^2.[287]

The Gunderboom proposed for Bowline Unit 3 will have an average flow rate of approximately 1.6 gpm/ft^2 or 1.1 mm/sec based on 3,200 ft^2 of Gunderboom and a 7.5 mgd flow rate.[288] The reported flow (hydraulic loading) rate of 12.3 gpm/ft^2 or 8.35 mm/sec observed in the Riverkeeper test panels is over 7.5 times higher than the 1.6 gpm/ft^2 anticipated flow (hydraulic loading) rate through the proposed Bowline Unit 3 Gunderboom.[289]

Furthermore, the Riverkeeper reported 12.3 gpm/ft^2 (8.35 mm/sec) flow (hydraulic loading) rate was achieved at only 1 inch of water head differential.[290] The proposed Bowline Unit 3 Gunderboom is designed for a maximum water head differential of 2 inches. If the Riverkeeper test had been performed at a 2-inch water head differential, the reduced flow rate would have been approximately 12.3 x 2 = 24.6 gpm/ft^2 (16.7 mm/sec).[291] This is over 15 times higher than required by the Bowline Unit 3 Gunderboom design and represents a considerable safety margin.[292] Thus, the Riverkeeper test results do not support Hearing Examiner Casutto's

---

[286] Id. at 66, Finding 82.

[287] H. Tr. at 1622.

[288] Id.

[289] Id.

[290] Id.

[291] Id.

[292] Id.

conclusion.

Moreover, the pattern of biological growth during the test demonstrates that even if "hot spots" -- areas of the boom with higher than average flow velocities -- occur, they are not expected to exceed the Gunderboom design criterion of 5 gpm/ft^2. The design permitivity of 5.0 gpm/ft^2 for a 1-inch water head differential is an estimate of filter material permitivity after a long deployment period and is well below the 12.3 gpm/ft^2 (8.35 mm/sec) value obtained by the Riverkeeper test.[293] Biological growth will be greatest near the water surface and decreased with depth.[294] Thus, it can be inferred that flow through the Gunderboom fabric also will increase with depth.[295]

b. The Lovett Gunderboom Deployment Demonstrates that Biological Growth Will Not Compromise the Gunderboom's Effectiveness

Hearing Examiner Casutto acknowledges in the Recommended Decision that biological growth has occurred at Lovett without preventing successful performance.[296] However, he relies on the results of the Riverkeeper and FTA tests, not the Lovett experience,

---

[293] Id. at 1623.

[294] Id. at 1624; Exh. 115 at 2-19.

[295] H. Tr. at 1624.

[296] R.D. at 30; see Exh. 115 at 2-19; H. Tr. at 1457.

in concluding that biological growth will be a contributing factor limiting the Gunderboom's effective exclusion.[297]

There is no evidence in the record that biological growth adversely affected the Gunderboom's filtering capacity. In 1999, algal growth occurred during the Lovett Gunderboom deployment in localized areas of the boom. The greatest growth was recorded at the southern end of the boom in the vicinity of the Lovett Unit 4 discharge near the water surface.[298] The algal growth was light at the bottom of the Gunderboom.[299] The only evidence relating to the algal growth during the 1999 Lovett deployment is that the algal growth did not affect adversely the boom's filtering capacity.[300]

During the 2000 Lovett deployment, algal growth also was observed on the boom.[301] The algal filaments did not mat on the surface of the Gunderboom material, but remained freely floating in the water currents.[302] Riverkeeper witness Huddleston acknowledged on cross-examination that the algal growth did not affect the functioning of the Gunderboom

---

[297] R.D. at 30.

[298] Exh. 115 at 2-18.

[299] Id.

[300] H. Tr. at 1456.

[301] Exh. 115 at 2-19.

[302] Id. at 2-19. More algae growth existed in the upper portion (photic zone) of the water column than at the bottom. Algae growth also concentrated where there were areas of excess fabric.

system at Lovett.[303]

POINT IV

THE RECORD DEMONSTRATES THAT THE PROPOSED BOWLINE UNIT 3 GUNDERBOOM FABRIC WITH A 0.425 MM APPARENT OPENING SIZE WILL BE AN EFFECTIVE EXCLUSION DEVICE

In the Recommended Decision, the Hearing Examiner confirmed that the draft SPDES Permit requires that "the maximum pore size of the outside [Gunderboom] fabric shall be 0.5 mm, and the inside fabric may have larger holes to facilitate cleaning."[304] The Hearing Examiner also recognized that the draft SPDES Permit does not specify a methodology for compliance with the requirement "not to exceed 0.5 mm."[305] Based on the testimony of Mirant witness Dr. Marr, the Hearing Examiner concluded that the appropriate methodology for measuring geotextile perforation size "such as the Bowline Unit 3 fabric" is the ASTM Standard Test Method for Determining Apparent Opening Size ("AOS") of a Geotextile.[306] As such, the Hearing Examiner concluded that the final SPDES Permit should specify the AOS standard instead of the "imprecise" language of the draft SPDES Permit. Id. at 33.

The Hearing Examiner found that the dry Bowline Unit 3 fabric sample had a pore

---

[303] H. Tr. at 2285-2286.

[304] R.D. at 58, Finding 83.

[305] Id., Finding 84.

[306] Id. at 58-59, Finding 88.

size, as measured by the AOS standard, of 0.5 mm (as specified in the draft SPDES Permit) and that the wet Bowline Unit 3 fabric sample had a pore size, as measured by the AOS standard, of 0.425 mm.[307] Nonetheless, based on the hole size of the Gunderboom fabric used at Lovett, the Hearing Examiner stated that "[t]he 0.5 mm reference in the Bowline draft SPDES Permit historically has referenced to the diameter of the holes, not the AOS measurement."[308] However, the Hearing Examiner's conclusion that the phrase, as used in the draft SPDES Permit, "maximum pore size" meant the diameter of the holes is not supported by the record or the Hearing Examiner's findings of fact.

The Hearing Examiner found that the proper measurement of the pore size of a geotextile is the AOS.[309] He also found that the language of the draft SPDES Permit was imprecise.[310] Thus, based on his acceptance of the AOS test and the actual language of the draft SPDES Permit, there is no basis for concluding that the 0.5 mm reference in the draft SPDES Permit referred to the diameter of the holes and not the AOS measurement. The draft SPDES Permit does not equate the 0.5 mm "maximum pore size" with a 0.212 mm AOS. Nor does the draft SPDES Permit equate it with a 0.5 mm optically measured dimension.

Moreover, the conclusion that the draft SPDES Permit refers to the diameter and not the AOS measurement is inconsistent with the Hearing Examiner's conclusion that the

---

[307] Id. at 59, Findings 91 and 92.

[308] Id. at 59-60, Finding 96.

[309] Id. at 33 and 59, Finding 90.

[310] Id. at 33.

appropriate methodology for measuring geotextile perforation size is the AOS methodology. Nonetheless, based on the fact that the Lovett reports indicate that the boom material used at Lovett over the past three had an AOS of 0.212 mm, the Hearing Examiner concluded that:

> The Lovett Gunderboom history of exclusion effectiveness (for fabric with 0.5 mm diameter perforations and 0.212 mm AOS) does not pertain to, and is irrelevant to, the exclusion effectiveness of the proposed Bowline Unit 3 fabric (with 1.0 mm diameter perforations and 0.425 mm AOS).[311]

Further, the Hearing Examiner stated that:

> Mirant has not provided any explanation relating the performance of the Lovett fabric to the performance of the new fabric (nor has DEC Staff). Consequently, the record contains no evidence of effectiveness in exclusion of fish for the new Gunderboom fabric.[312]

Contrary to the Hearing Examiner's unsupported conclusion, the record demonstrates that the fabric proposed for use in the Bowline Unit 3 Gunderboom will effectively exclude ichthyoplankton and that the Lovett Gunderboom performance is relevant to the Bowline Unit 3 Gunderboom. The Hearing Examiner's focus on the size of the perforations in the Gunderboom fabric is in error for the additional reason that the flow through the Gunderboom is analogous to ground water flow rather than the flow of water through a pipe (i.e. a hole)[313]. The perforations are designed to allow sediment, should it build up on the curtain and

---

[311] Id. at 60, Finding 97.

[312] Id., Finding 98.

[313] H. Tr. at 1628.

be dislodged by the AirBurst system, to pass through the perforations.[314] Thus, the primary exclusion device is the fabric itself. Because the perforations are, in any event, smaller than the ichthyoplankton targeted for exclusion at this location along the Hudson River, the filtering ability of the curtain is not compromised.

A. The Record Contains Evidence That the New Gunderboom Fabric Will Be an Effective Exclusion Device

As Mirant witness Dr. Marr testified, the Gunderboom fabric proposed for Bowline Unit 3 has an AOS of 0.425 mm when wet and 0.5 mm when dry. And, as Dr. Marr testified and the Hearing Examiner found, the AOS size of a geotextile indicates the approximate largest size particle that will pass through the geotextile.[315] The standard AOS test is performed on a specimen of the geotextile on a sieve frame, with sized glass beads placed on the geotextile surface. Then the frame is shaken by a special apparatus to induce the beads to pass through the fabric.[316] The procedure is repeated on the same specimen with various size glass beads until its apparent opening size has been determined.[317] Beads smaller than the large openings in the tested material will shake through the material and fall into a pan at the base. Thus, only particles smaller than 0.425 mm will pass through the openings in the Bowline Unit 3

---

[314] Id. at 1631.

[315] Id. at 59, Finding 89.

[316] Id.

[317] H. Tr. at 2392.

Gunderboom fabric when it is wet. Inasmuch as the Bowline Unit 3 Gunderboom will be deployed in the water, the AOS when the fabric is wet is determinative of the size particle that could pass through the Bowline Unit 3 Gunderboom fabric.

Table 8.3 of the Article X Application, which is entitled "Egg Diameter (mm) and Total Length (mm) of Yolk Sac Larvae, Post Yolk Sac Larvae, and Juvenile Target Fishes,"[318] sets forth the egg diameters for the target fishes in Bowline Pond. As Table 8.3 demonstrates, the diameters are, at a minimum, two to three times larger than the AOS of the proposed Bowline Unit 3 Gunderboom material.

Table 8.3: **Egg Diameter (mm) and Total Length (mm) of Yolk Sac Larvae, Post Yolk Sac Larvae, and Juvenile Target Fishes**

	EGGS	**YSL**	**PYSL**	**JUV**
Species	**Egg Diameter at Fertilization (mm)**	**Yolk Sac Larva Length (mm)**	**Preflexion-Transitional Larva Length (mm)**	**Juvenile Length (mm)**
White perch	1.6	1.6-3.2	3.2-25.4	25.4
Bay anchovy	1.6	1.6-3.2	3.2-12.7	12.7
River herring**	1.6-3.2	3.2-6.3	6.3-20.3	20.3
American shad	1.6-3.2	6.3-12.7	12.7-20.3	20.3
Striped bass	3.2	3.2-6.3	6.3-25.0	25.0
Spottail shiner	1.0-1.4	4.7-6.9	6.9-18.0	18.0
Atlantic tomcod	1.6	4.8	6.3-25.4	25.4-50.8

[318] Exh. 1, Vol. II, at 8-95.

The Hearing Examiner has acknowledged that the Bowline Pond/Haverstraw Bay area is not located within the principal spawning area of the Hudson River target fish species. His finding is supported by, inter alia, the data in Appendices 8D and 8E of the Article X Application, which indicates that the early life stage data for ichthyoplankton collected at the Bowline Unit 1 and Unit 2 intakes represent primarily post yolk sac larvae, which are older and much larger than eggs and yolk sac larvae.[319] Thus, based on the fact that the size of the target fishes is larger than an AOS of 0.425 mm, the Bowline Unit 3 Gunderboom fabric will exclude effectively the target fish species.

B. The Lovett Gunderboom History is Relevant to the Proposed Bowline Unit 3 Gunderboom

As set forth above, the record demonstrates that the proposed Bowline Unit 3 Gunderboom fabric with an AOS of 0.425 mm effectively will protect the target fish species in Bowline Pond. Thus, the fact that the AOS of the Lovett fabric differs from that of the Bowline Unit 3 Gunderboom fabric does not mean that the Lovett Gunderboom experience is not relevant to Bowline Unit 3. The Lovett experience is relevant because it demonstrates that the Gunderboom system effectively excludes ichthyoplankton.

First, the Lovett Gunderboom has been effective even though the 1995 and 1998 ichthyoplankton studies were conducted during the development and refinement of the Gunderboom system. The 2000 Lovett Gunderboom was deployed successfully without a fully

[319] Exh. I, Vol. VI.

automated Air Burst system. The AirBurst system at Bowline Unit 3 will be integrated fully into the plant operations. Unlike Lovett, where there was only a small diesel-fueled portable air compressor, at Bowline Unit 3 there will be a dedicated electric driven commercial air compressor with a redundant, backup air supply compressor. The back up air supply will be accessed automatically if the primary system fails.[320]

There will also be a full and formal Bowline Unit 3 Gunderboom system operation monitoring program, with light and audible alarm warning systems to call immediate attention to any excursion from acceptable operational conditions. During the Lovett system deployments, warnings were visible only on the control panel in the Gunderboom system shed. At Lovett, system monitoring and operation was not made part of the regular shift duties.[321] For Bowline Point Unit 3, warnings will be visible in the Control Room and regular monitoring, observations, and response to warnings will be made part of regular shift operations.[322] Further, in addition to routine visits and inspections, Gunderboom, Inc. will monitor the operational data.[323] And, a complete replacement boom will be on-site permitting the rapid replacement of a damaged boom if it is necessary.[324] Moreover, the intake will be protected not only with a Gunderboom, but also a 2 mm wedge-wire screen.

---

[320] H. Tr. at 1457.

[321] Id. at 1459.

[322] Id.

[323] Id.

[324] Id. at 1460.

Moreover, there are other factors that indicate that the Bowline Unit 3 Gunderboom will perform better than the Lovett Gunderboom. It is not the fabric alone, but the performance of the entire Gunderboom system that make the Gunderboom effective. Both the Bowline Pond environment and the conservative design of the Bowline Unit 3 Gunderboom are favorable for an effective deployment. First, the Bowline Pond environment is more benign than the Lovett environment. The Hearing Examiner found that "the Bowline Gunderboom will not be subject to strong bi-directional tidal currents and wave action."[325]

The Hearing Examiner stated that Mirant had represented initially that stronger currents are needed like those in the Hudson River.[326] However, this was based on the Applicant's preliminary consideration of a Gunderboom.[327] Subsequent to stating that in June 2000, the Applicant considered designs for the Bowline Unit 3 Gunderboom that took into account the specific conditions in Bowline Pond. The proposed design of the Gunderboom for Bowline Unit 3 is based, inter alia, on data collected at Bowline Pond,[328] a dive inspection of Bowline Pond,[329] boring logs of Bowline Pond,[330] and the currents inside Bowline Pond.[331] The

---

[325] R.D. at 61, Finding 111.

[326] R.D. at 54, Finding 55.

[327] Exh. 28, Response No. 4 at 6-7.

[328] Id.

[329] Id., Response No. 5 at 8-9.

[330] Id., Response No. 6 at 10.

[331] Id., Response No. 7 at 11-12.

record demonstrates that the proposed Gunderboom is designed for the conditions in Bowline Pond.[332]

Moreover, the Bowline Unit 3 Gunderboom has been designed conservatively. As indicated by the following chart, the design criteria include a safety margin that exceeds the anticipated operating conditions.[333]

Features	Maximum Anticipated Operating Conditions	Design Criteria
Flow Rate	5208 gpm	10,000 gpm
Unit Flow Rate	1.6 gpm/ft^2	5 gpm/ft^2
Head Differential	<1.0 inch	2.0 inches

The Bowline Unit 3 Gunderboom system will have substantially less flow per unit area and corresponding lower loading on the fabric and overall system than the Lovett Unit 3 Gunderboom. It also will be considerably smaller than the Lovett Unit 3 Gunderboom. The Lovett Gunderboom is 500 feet in length, compared to the Bowline Unit 3 Gunderboom which will be approximately 155 feet.[334] Thus, the successful deployment of the Gunderboom at Lovett, under conditions that are less favorable, is relevant to the performance of the Bowline Unit 3 Gunderboom.

---

[332] See Exh. 21, Response to Request No. 4, Attachment 4 (Bowline Pond Hydraulic Assessment).

[333] H. Tr. at 1620.

[334] Id. at 1463.

POINT V

DEC STAFF'S BTA ANALYSIS WAS CONDUCTED PROPERLY

As the Recommended Decision recognizes, the DEC Staff conducted the only BTA analysis in the record in this proceeding. However, the Hearing Examiner rejected the DEC Staff BTA analysis because: (1) it considered overall adverse environmental impacts and did limit the analysis to only the adverse impacts of the CWISs;[335] and (2) it did not start with the dry cooling option.[336] The Hearing Examiner also rejected the DEC Staff's "wholly disproportionate" cost analysis. As set forth below, the Hearing Examiner's criticisms of the DEC Staff BTA analysis should be rejected by the Commissioner.

A. The DEC Permit Writer Properly Examined Adverse Environmental Impacts

The Hearing Examiner concluded that the BTA analysis of adverse environmental impacts should be limited to minimizing the environmental impacts of the cooling water intake structures, not the project as a whole.[337] He states that the impacts of the project components, other than the CWISs, are properly considered in the Article X proceeding and not in a BTA

---

[335] R.D. at 15.

[336] Id. at 17, 41.

[337] Id. at 15.

analysis.[338] In reaching this conclusion, the Hearing Examiner ignores the Athens Interim Decision and reaches a conclusion which is inconsistent with the USEPA Final Rule.

In the Athens Interim Decision, Commissioner Cahill held, citing Hudson Riverkeeper Fund, Inc. v. Orange and Rockland Utilities, Inc.,[339] that:

> Determining BTA for an individual facility is an 'issue of fact', which turns on a variety of factors including, inter alia, cost, age of the facility, the number of fish killed, the additional energy, if any, needed to support improved technology, or other relevant concepts.[340]

In this case, other relevant concepts include cost, additional energy usage required by alternate technology and issues such as impacts on other aspects of the environment, including land use and wetland impacts.[341]

As noted above, the Hearing Examiner's conclusion also is inconsistent with the USEPA Final Rule. The USEPA determined it would not adopt dry cooling as the best technology available for minimizing adverse environmental impacts because, inter alia: (1) it has higher capital and operating costs; (2) it has a detrimental effect on electricity production because it reduces the energy efficiency of steam turbines;[342] and (3) there is an incremental

---

[338] Id. at 15-16, n. 12.

[339] 835 F. Supp. 160 (S.D.N.Y. 1993).

[340] Athens Interim Decision at 8 (citation omitted).

[341] Because the determination of BTA is a site specific determination of fact, Riverkeeper's allegation that the Applicant's proposal is not BTA because it is not dry cooling must be rejected.

[342] Final Rule at 65,282.

increase in air emissions attributable to dry cooling.[343] The USEPA specifically indicated that the performance penalties that result from the inefficiency of dry cooling during summer peak periods "could pose potential power supply and reliability issues if dry cooling were required on a nationwide or regional basis."[344] None of these reasons for the USEPA's rejection of dry cooling as the best technology available relates to the specific localized impact of the CWISs.

The record in this proceeding demonstrates that all of these impacts which concerned the USEPA would occur with the construction and use of dry cooling at Bowline Unit 3. First, as the Hearing Examiner recognizes, dry cooling has higher capital and operating costs than the Applicant's proposal.[345] Second, dry cooling will have a detrimental effect on the efficiency of Bowline Unit 3. If Bowline Unit 3 were required to utilize dry cooling, the greatest loss of efficiency would occur at 87°F. The following table sets forth the net power output loss due to loss of efficiency of the steam turbine and parasitic electrical loads that will result from installing an air-cooled condenser (dry cooling) at Bowline Unit 3:[346]

Temperature	Decrease
40° F	6.6 MW
59° F	10.1 MW
87° F	18.2 MW

343 Id. at 65,283.

344 Id.

345 R.D. at 71, Findings 114, 115.

346 Exh. 1, Vol II, § 16.0 at 16-5.

Because dry cooling has the greatest plant net power decrease impact in the warm weather, which is when the southeastern area of New York State experiences its largest demand for electrical energy, the performance penalties will occur during the summer peak periods. Thus, at 87° F. there will be 18.2 MW less electricity to meet consumers' needs if dry cooling is required.[347] Because demand in the wholesale and retail electric markets will not experience a corresponding reduction, it is reasonable to expect that the additional electricity needed to meet demand probably will be generated by older, less efficient generating facilities, which may utilize once-through cooling in the Hudson River estuary.

Third, there will be an incremental increase in air emissions. The 18.2 MW that will not be available for consumers when the temperature is 87° F because of the inefficiency of dry cooling will have to be supplied by other generating facilities. Based on the Applicant's MAPS run, the loss of 18.2 MW would result in increases in NO_x, SO_x and CO_2.[348]

In addition, Hearing Examiner Lynch and Hearing Examiner Casutto in the Article X Recommended Decision concluded that "hybrid cooling would minimize environmental impacts from a terrestrial ecology perspective compared with dry cooling".[349] They also found that hybrid cooling "would minimize impacts on habitat and wildlife".[350]

Thus, the Hearing Examiner incorrectly rejected the DEC Staff's and the

---

[347] Id. at 16-6.

[348] Exh. 40 at 18.

[349] Article X Recommended Decision at 67.

[350] Id.

Applicant's consideration of adverse impacts that are not occasioned soley by the CWIS.

B. A BTA Analysis Does Not Have to Begin with Dry Cooling

In the Recommended Decision, Hearing Examiner Casutto determined that dry cooling "is undisputedly the available technology that presumptively minimizes fish mortality by reducing . . . (capacity) for a particular project".[351] He held that the reductions achieved by dry cooling are those against which reductions achieved by any other proposed technologies must be measured in evaluating what is BTA for a particular facility.[352] The Hearing Examiner held that "logic dictates that the BTA analysis must begin" with dry cooling.[353] Thus, he stated that "DEC Staff should have started this [BTA] analysis with the dry cooling technology option."[354]

---

[351] Id. at 17. The issue of capacity is misleading as addressed by the Hearing Examiner. The issue is whether the conditional mortality results of various technologies are functionally equivalent. As this record demonstrates, the Applicant's proposed CWIS protection and dry cooling are functionally equivalent.

[352] Id.

[353] R.D. at 17. The Recommended Decision noted that the Commissioner in Athens adopted this same analysis – that BTA determinations begin with dry cooling. See id. It is submitted that the Recommended Decision in this regard misreads the Commissioner's holding. In Athens, dry cooling was found to be BTA only after the Commissioner had considered the applicant's proposed hybrid cooling system with Gunderboom unsuitable for the project at that location. See Athens Interim Decision at 11. The Commissioner never held that all BTA analyses must begin with dry cooling, and that other technologies may be considered only if the cost of dry cooling is wholly disproportionate to its benefits.

[354] R.D. at 41.

However, neither logic nor law dictates that the BTA analysis must begin with dry cooling. The Hearing Examiner found, as did DEC Staff, that "Mirant's hybrid cooling alternative is approximately equivalent to the level of protection provided by the use of dry cooling technology towers that require less water for cooling."[355] In fact, the Hearing Examiner acknowledged that there was no evidence that the differences in Conditional Mortality Rates ("CMRs") between dry cooling and hybrid cooling "are significant" or that the CMR modeling was incorrect.[356] Consequently, based on the fact that the two technologies are "approximately equivalent," logic dictates that the BTA analysis could begin with either technology. The CMRs demonstrate that the Hearing Examiners presumption that the capacity of an intake is determinative of fish mortality is contrary to the evidence.

The Hearing Examiner found that Mirant's proposed hybrid cooling/Gunderboom would require a maximum cooling water intake capacity "42.9 times" more than dry cooling.[357] However, the CMRs indicate that the fish mortality attributable to the Applicant's proposal is not "42.9 times" more than the fish mortality attributable to dry cooling.[358] To the contrary, DEC witness Cianci testified that a comparison of the CMRs for the Bowline Unit 3 intake, as proposed by the Applicant, with CMRs for dry cooling, yielded essentially no difference.[359]

---

[355] Id. at 71, Finding 113.

[356] Id. at 51.

[357] Id. at 52, Finding 41.

[358] H. Tr. at 1736.

[359] Id. at 2117.

When asked if it was true that dry cooling reasonably would minimize adverse impacts to ichthyoplankton more than hybrid cooling technology, Mr. Cianci stated "[a]s a biologist I would say no, that not necessarily correct." As Mr. Cianci testified, the CMR numbers are "extremely low, almost impossible to calculate".[360] The CMRs for both technologies are in the thousandths and ten-thousandths of a percent.[361]

Moreover, the USEPA expressly rejected any requirement that a BTA analysis begin with dry cooling as the starting point. As set forth above,[362] the USEPA has determined in its Final Rule that dry cooling systems are not the best technology available to minimize adverse environmental impact.[363] Instead, the USEPA has established closed-cycle recirculating wet cooling systems as the primary, national standard for cooling structures and CWISs.[364] Significantly, this is the standard for all BTA analyses -- both Track I and Track II.[365] Therefore,

---

[360] Id. at 2030.

[361] R.D. at 63, Findings 122, 123.

[362] See supra, Point I.D.

[363] Final Rule at 65,282 - 65,284 ("EPA believes that it is reasonable to reject dry cooling as a nationally applicable minimum in all cases"); Technical Document at 4-13 ("EPA [has] concluded that dry cooling systems do not represent the best technology available for a national requirement").

[364] Final Rule at 65,340, §125.84 (b); Id. at 65, 271, 65, 273, 65,282. Significantly, EPA also noted that closed-cycle systems "reduce the amount of cooling water needed and in turn directly reduce the number of aquatic organisms entrained in the [CWISs]," (Final Rule at 65, 273), and that dry cooling "would not significantly reduce entrainment and impingement beyond the regulatory approach selected by EPA." Technical Document, at 4-14.

[365] Final Rule at 65,341, §125.84 (d) (1). The Source Water Biological Study that must accompany Track II facilities must evaluate entrainment and impingement impacts assuming a

the proper starting point for a BTA determination, under the new regulations, is a closed-cycle recirculating system intake level, not a dry cooling level.

C. The Costs of Dry Cooling are Wholly Disproportionate to the Environmental Benefit

The Hearing Examiner stated that the use of dry cooling would result in a "relatively insignificant increase in the total cost of the facility" and that the costs are not "wholly disproportionate" to the environmental benefits to gained.[366] He rejected the DEC Staff's conclusion that they are wholly disproportionate. As set forth below, the Hearing Examiner's conclusion is not supported by the evidence in this proceeding, is inconsistent with the Athens Interim Decision and does not reflect the USEPA's Final Rule.

The "wholly disproportionate" cost test does not require a comparison of the increased cost of dry cooling to the overall costs of the facility. Rather, the "wholly disproportionate" test requires a comparison of the increased cost to the environmental benefits to be gained.[367] Commissioner Cahill stated in the Athens Interim Decision that "[c]osts are an acceptable consideration in determining whether the intake design reflects the best technology

---

design of a once-through cooling water system employing a trash rack and traveling screens, rather than a dry cooling system. See id. at 65,342, §125.86 (c) (2) (iv) (A); 65,318.

[366] R.D. at 46.

[367] Athens Interim Decision at 15; In re Public Serv. Co. of N.H. (Seabrook Station, Units 1 and 2), No. 76-7, 1977 EPA App. Lexis 16, at *19 (EPA Envtl. App. Bd. June 10, 1977).

available."[368] Commissioner Cahill, then, compared the cost of dry cooling to the cost of hybrid cooling.[369] Commissioner Cahill specifically stated that "[a]n additional § 316(b) factor persuading me that dry cooling technology is appropriate for this project relates to the cost differences between the hybrid plus Gunderboom system and a dry cooling system."[370] And, then the additional cost of dry cooling was considered relative to the environmental benefits to be gained.

Nowhere in the Recommended Decision does the Hearing Examiner compare the value of any environmental benefits of dry cooling to the cost of the technology. The Hearing Examiner compared the difference between the cost of dry cooling and hybrid cooling with the total cost of construction of Bowline Unit 3.[371] Based on an assumed construction cost of the project of $400 million, he concluded that the increase cost of $14.519 million for dry cooling was "relatively insignificant."[372] However, the purpose of the test is not to determine whether the additional costs are significant or insignificant relative to the total cost of a project. Rather, the "wholly disproportionate" test is used to determine whether the incremental environmental benefits justify the additional costs of a technology. And, the record demonstrates that the costs are wholly disproportionate.

---

[368] Athens Interim Decision at 14 (emphasis added).

[369] Id.

[370] Id.

[371] R.D. at 71, Conclusion of Law 49.

[372] Id., Conclusion of Law 50.

In the Recommended Decision, the Hearing Examiner found that the protection afforded by Mirant's hybrid cooling alternative "is approximately equivalent to the level of protection provided by use of dry cooling technology towers."[373] The Hearing Examiner also found that the CMRs are in the order of magnitude of thousandth and ten-thousandth of a percent from Mirant's Gunderboom technology proposal and that the dry cooling CMRs would be "only fractionally" less than those of Mirant's Gunderboom proposal.[374] The only testimony comparing the costs of dry cooling to the environmental benefits of dry cooling at Bowline Unit 3 is the testimony of DEC witness Cianci. Neither, Scenic Hudson nor Riverkeeper submitted any cost analysis relating to the cost of dry cooling at Bowline Unit 3 vis-a-vis the environmental benefits gained.[375] And, Mr. Cianci's testimony is not ambiguous:

> Q. Is the costs [sic] of dry cooling wholly disproportionate in relation to the environmental benefits?
>
> MR. CIANCI: [W]hen you look at the benefits that you are deriving from installation of dry cooling, they are in no way worth even a dollar of additional cost, much less 14.1 million dollars[376]

---

[373] Id. at 62, Finding 113.

[374] The Hearing Examiner neglected to include the cost of the additional fuel that would be consumed if dry cooling were required. The additional fuel is estimated to be $426,269 annually. H. Tr. at 1741-1742.

[375] Scenic Hudson's witness Dougherty did not address the cost of hybrid cooling vs. dry cooling for Bowline Unit 3. Although Mr. Dougherty acknowledged that a BTA determination is site specific, he did not perform any studies or costs of technologies at Bowline Unit 3. H. Tr. at 2482, 2492.

[376] H. Tr. at 2049-2050.

Moreover, the USEPA Final Rule reflects a determination by the USEPA that the costs of dry cooling are wholly disproportionate to the incremental benefits. Indeed, the additional cost of dry cooling was one of the reasons that the USEPA rejected dry cooling as BTA.[377] The USEPA focused on increased capital and operating costs associated with dry cooling compared to the cost of wet cooling. The USEPA did not consider the total cost of the project in its analysis.

Indeed, the USEPA found that its Final Rule, based on closed-cycle recirculating cooling towers "is very effective in reducing impingement and entrainment" at considerably less cost that dry cooling.[378] Thus, the USEPA, comparing the incremental cost of dry cooling with the environmental benefits to be gained, has concluded that the costs are "wholly disproportionate."

---

[377] Final Rule at 65,282 - 65,284.

[378] Id. at 65,284.

CONCLUSION

The Commissioner should not adopt the recommendation of the Hearing Examiner that the best technology available for the cooling water intake structure for Mirant's Bowline Unit 3 is dry cooling. The Hearing Examiner's conclusion is manifestly wrong for several significant reasons. First, the Hearing Examiner's recommendation is contrary to both the substance of, and the guidance provided by, the USEPA Final Rule implementing Section 316(b) of the Clean Water Act. The substantive provisions of the Final Rule lead unequivocally to the conclusion that the cooling water intake structure proposed in the draft SPDES Permit and supported by DEC Staff and Mirant as BTA, an intake limited to 7.5 mgd with a 2mm wedgewire screen and a Gunderboom, is BTA for Bowline Unit 3.

Second, the Hearing Examiner's grant of the Riverkeeper's motion for an adverse inference regarding the performance of the Gunderboom is unsupported by the record evidence. The Hearing Examiner found that Mirant had not violated any discovery order and, in fact, had provided Riverkeeper with the requested Gunderboom material. Moreover, in addition to the motion's lack of merit, it should have been denied, given the fact that there was never a complaint by Riverkeeper regarding this discovery or any request made to the Hearing Examiner on this issue until three months after the requested material was delivered to Riverkeeper and then only on the last day of hearings.

Third, the Commissioner should reject the Hearing Examiner's recommendation given the Hearing Examiner's clearly incorrect reading of Commissioner Cahill's Athens Interim

Decision. A proper reading of the Athens Interim Decision and this record demonstrates, without doubt, that the proposed intake structure in the draft SPDES Permit is BTA for this project.

Fourth, a fair reading of this record which includes the record of the performance of the Gunderboom at Lovett, as well as the additional study performed by DEC witness Radle, leads to the unequivocal conclusion that the Gunderboom technology is not experimental and that it should be found to be an integral part of the BTA cooling water intake structure for Bowline Unit 3.

Respectfully Submitted,

Barbara S. Brenner

Barbara S. Brenner, Esq.
COUCH WHITE, LLP
540 Broadway - 7th Floor
P.O. Box 22222
Albany, New York 12201
(518) 426-4600
(518) 426-0376

Of Counsel: Algird F. White, Jr., Esq.
Barbara S. Brenner, Esq.
James S. King, Esq.
Peter K. Rydel, Esq.

J:\DATA\Client1\08027\Briefs\DEC\DEC Brief on Exceptions.wpd

APPENDIX A

Methodology Used to Estimate the River Volume at Mean Low Water Over the Tidal Excursion Distance

(1) Locate the facility on either a NOAA nautical chart or a base map created from the USGS 1:100,000 scale Digital Line Graph (DLG) data available on the USGS website. These DLG Data can be imported into a computer aided design (CAD) program or geographic information system (GIS). If these tools are unavailable, 1:100,000 scale topographic maps (USGS) can be used.

The facility was located on NOAA Nautical Chart No. 12343 entitled "Hudson River, New York to Wappinger Creek." The chart has a horizontal scale of 1:40,000.

(2) Obtain maximum flood and ebb velocities (in meters per second) for the water body in the area of the cooling water intake structure from NOAA Tidal Current Tables.

The maximum flood and maximum ebb current speeds for Haverstraw Bay (Station No. 3686) were obtained from NOAA Tidal Current Tables for the Atlantic Coast of North America, 1998.

Maximum flood current: 0.8 knots = 0.41 m/s

Maximum ebb current: 1.3 knots = 0.67 m/s

(3) Calculate average flood and ebb velocities (in meters per second) over the entire flood or ebb cycle by using the maximum flow and ebb velocities from 2 above.

$V_{\text{average flood}} = V_{\text{maximum flood}} * 2/3.14$ (Equation 1)

$V_{\text{average flood}} = 0.41\ \text{m/s} * 2/3.14$

$V_{\text{average flood}} = 0.26\ \text{m/s}$

$V_{\text{average ebb}} = V_{\text{maximum ebb}} * 2/3.14$ (Equation 2)

$V_{\text{average ebb}} = 0.67\ \text{m/s} * 2/3.14$

$V_{\text{average ebb}} = 0.43\ \text{m/s}$

(4) Calculate the flood and ebb tidal excursion distance using the average flood and ebb velocities from 3 above.

$$\text{Distance}_{\text{flood tidal excursion}} = \text{Velocity}_{\text{average flood}} * 6.2103 \text{ hr} * 3600 \text{ s/hr} \quad \text{(Equation 3)}$$

$$\text{Distance}_{\text{flood tidal excursion}} = 0.26 \text{ m/s} * 6.2103 \text{ hr} * 3600 \text{ s/hr}$$

$$\text{Distance}_{\text{flood tidal excursion}} = 5813 \text{ m}$$

$$\text{Distance}_{\text{ebb tidal excursion}} = \text{Velocity}_{\text{average ebb}} * 6.2103 \text{ hr} * 3600 \text{ s/hr} \quad \text{(Equation 4)}$$

$$\text{Distance}_{\text{ebb tidal excursion}} = 0.43 \text{ m/s} * 6.2103 \text{ hr} * 3600 \text{ s/hr}$$

$$\text{Distance}_{\text{ebb tidal excursion}} = 9614 \text{ m}$$

(5) Using the total of the flood and ebb distances from above, define the diameter of a circle that is centered over the opening of the cooling water intake structure.

The total flood and ebb distances from step 4 are:

5813 m + 9614 m = 15,427 m

(6) Define the area of the waterbody that falls within the area of the circle. The area of the waterbody, if smaller than the total area of the circle might be determined either by using a planimeter or by digitizing the area of the waterbody using a CAD program or GIS.

The circle was superimposed on the NOAA Nautical Chart.

(7) Calculate the average depth of the waterbody area defined in 6 above. Depths can easily be obtained from bathymetric or nautical charts available from NOAA. In many areas, depths are available in digital form.

The area within the circle defined in step 6 was divided into sub-areas. The plan view area within each sub-area was estimated using a digitizer tablet.

(8) Calculate a volume by multiplying the area of the waterbody defined in 6 by the average depth from 7. Alternatively, the actual volume can by calculated directly with a GIS system using digital bathymetric data for the defined area.

The volume at mean low water was estimated by multiplying the average depth over each sub-area times the surface area of each sub-area and summing the results.

The volume at mean low water was estimated to total 9.14 x 10^9 cubic feet.

The estimated Unit 3 withdrawal volume is 7.5 million gallons per day or approximately 1 million cubic feet per day. The withdrawal volume over one tidal cycle (12.4 hours) would be 518,050 cubic feet.

Therefore, the average daily withdrawal volume represents 0.011% of the volume contained within the tidal excursion distance.

The withdrawal volume over 1 tidal cycle (12.4 hours) represents 0.006% of the volume contained in the river over the tidal excursion distance.

J:\DATA\Client1\08027\Briefs\DEC\Schafer Insert.wpd