Clean Ocean Action

www.CleanOceanAction.org

Ocean Advocacy Since 1984

■ **Main Office**
18 Hartshorne Drive
P.O. Box 505, Sandy Hook
Highlands, NJ 07732-0505
Voice: 732-872-0111
Fax: 732-872-8041
SandyHook@CleanOceanAction.org

□ **Institute of Coastal Education**
3419 Pacific Avenue
P.O. Box 1098
Wildwood, NJ 08260-7098
Voice: 609-729-9262
Fax: 609-729-1091
Wildwood@CleanOceanAction.org

CLEAN OCEAN ACTION, THE AMERICAN LITTORAL SOCIETY, SAVE BARNEGAT BAY, JERSEY COAST ANGLERS ASSOCIATION, FISHERMAN'S DOCK CO-OP, INC., NJ BEACH BUGGY ASSOCIATION, GARDEN STATE SEAFOOD ASSOCIATION, AND THE UNDERSIGNED PARTIES

November 21, 2005

Howard B. Tompkins, Chief
New Jersey Department of Environmental Protection
Bureau of Point Source Permitting, Region 1
P.O. Box 029
Trenton, NJ 08625
Attn: Comments on PN #NJ0005550

Re: Oyster Creek Nuclear Generating Station /
NJPDES Permit No. NJ0005550 / Comments on Draft Permit

Dear Mr. Tompkins:

These comments are submitted in response to the above referenced draft permit by Clean Ocean Action, the American Littoral Society, Save Barnegat Bay, Jersey Coast Anglers Association, Fisherman's Dock Co-op, Inc., NJ Beach Buggy Association, Garden State Seafood Association, and several other groups and individuals (the "Undersigned Parties") having particular interests in the preservation and protection of the Forked River, Barnegat Bay, Oyster Creek, the surrounding estuary, and their resources.

In short, the Undersigned Parties support the New Jersey Department of Environmental Protection's (the Department or NJDEP) Preferred Alternative (Alternative 1), the installation of a closed-cycle cooling system, and object to the use of restoration as a compliance measure (Alternative 2) in the Draft New Jersey Pollution Discharge Elimination System permit for Oyster Creek Nuclear Generating Station.

Clean Ocean Action is a broad-based coalition of conservation, environmental, fishing, boating, diving, student, surfing, women's, business, service, and community groups. Our goal is to improve the degraded water quality of the marine waters off the New Jersey/New York coast. Clean Ocean Action identifies sources of pollution and

mounts attacks on each source by using research, public education, and citizen action to convince our public officials to enact and enforce measures that will clean up and protect our ocean.[1]

The American Littoral Society (ALS) is a national, non-profit organization whose mission is to promote the study and conservation of coastal areas and marine ecosystems. ALS' work involves a combination of law, policy, and educational activities that introduce citizens to their marine environment, the effects of human activities taking place in the water and on the land, and to approaches for its conservation.[2]

Save Barnegat Bay is a not-for-profit environmental group, founded in 1971, working to conserve undeveloped natural land and clean water throughout the Barnegat Bay watershed.[3]

The Jersey Coast Anglers Association (JCAA) is an association of more than 75 saltwater fishing clubs that represents the position of marine sport anglers, champions their causes and protects their rights in matters pertaining to fishing, fisheries, and environmental quality. In doing so, JCAA often works in concert with major environmental organizations and other influential associations of sports clubs.

The Fisherman's Dock Co-op, Inc., of Point Pleasant, NJ, a commercial fishing cooperative that has been in business over 50 years, directly employs around 100 fishermen and staff, whose livelihoods depend on healthy fish stocks and a clean, safe environment for those stocks to live in.

The purpose of the New Jersey Beach Buggy Association shall be, to foster, perpetuate and promote a closer relationship among all owners of beach buggies and surf fishing people. To work for the proper conservation of marine waters, beaches and marine sport fisheries. To encourage its members to adhere strictly to the Associations Code of Ethics and to the Laws of the Country, State, and Municipalities where surf fishing and beach buggies are allowed to operate.

Garden State Seafood Association members are commercial seafood harvesters and related businesses, including fish and seafood wholesalers, retailers, restaurateurs, and others with an interest in the sustainable production of Jersey Fresh seafood from our coastal waters.

Public review and reevaluation of Oyster Creek Nuclear Generating Station's (the "Station" or "OCNGS") Draft New Jersey Pollution Discharge Elimination System ("NJPDES") permit provides an essential opportunity to support the elimination of the ongoing damage to the marine environments of the Forked River, Oyster Creek, and Barnegat Bay caused by OCNGS. Recognized by EPA as one of 28 estuaries of "national significance," Barnegat Bay "is not only a vital component of New Jersey's tourist industry, but is an important natural resource that supports populations of commercially and recreationally significant fish, shellfish, and rare and

[1] Visit http://www.cleanoceanaction.org for more information.
[2] Visit http://www.littoralsociety.org for more information.
[3] Visit http://www.savebarnegatbay.org for more information.

endangered species."[4] Oyster Creek, which discharges into Barnegat Bay, "represents a high-use recreational fishery," as stated by our NJDEP Commissioner Bradley Campbell.[5]

The Barnegat Bay Estuary and the streams that flow into the estuary, including Oyster Creek and Forked River, are invaluable resources, albeit currently degraded. Federal, state, and local initiatives are dedicating millions of dollars annually to restore and improve Barnegat Bay. However, the single greatest industrial abuse to Barnegat Bay, OCNGS, continues.

Construction of the Station began in 1964, with operation commencing in December 1969. At that time, neither the federal Clean Water Act nor New Jersey's Water Pollution Control Act had yet been enacted. According to a 2001 study on the State of the [Barnegat Bay] Estuary,

> "[c]onstruction and operation of the OCNGS caused the loss and alteration of habitat in Forked River and Oyster Creek. Dredging and construction of the intake and discharge canals destroyed most of the original freshwater and low salinity habitats in the affected portions of the streams. The diversion and misuse of water at the Station changed the salinity, temperature, and dissolved oxygen levels in both streams such that they became similar to those of the bay."[6]

This type of ecosystem destruction has since become prohibited by law, in most circumstances. In fact, if OCNGS were a new or modern facility, it is highly unlikely that it would be able to build at its present location because federal regulations now require special precautions for reactors sited proximate to waterways.[7]

The Undersigned Parties analyzed the draft permit and present the following comments to ensure that the new permit is consistent with federal and state laws and adequately resolves the Station's current marine degradation issues, especially those related to its antiquated once-through cooling water system.

Federal law now obligates OCNGS to implement Section 316(b) of the federal Clean Water Act, which requires that the "location, design, construction, and capacity of cooling water intake *structures* reflect the ***best*** *technology available for minimizing adverse environmental impact*" (emphasis added).[8] The Department, under their delegated authority, has the legal obligation to require OCNGS to comply with the new Phase II Rules. Because all NJPDES permits must include any applicable Federal or State statutory or regulatory requirements that take effect prior to final permit issuance,[9] the Phase II Rules, a federally created obligation, must be incorporated into any new NJPDES permit issued to OCNGS.

---

[4] See http://www.epa.gov/owow/estuaries/programs/barn.htm.
[5] NJDEP Press Release: Oyster Creek Generating Station Fined for Water Violations and Fish Kill: NJDEP Seeks Compensation for Natural Resource Damages (Dec. 12, 2002).
[6] M.J. Kennish, (2001) State of the Estuary and Watershed: An Overview. Journal of Coastal Research. SI 32: 243-273.
[7] 10 C.F.R. 100.10(c)(3).
[8] 33 U.S.C. 1326(b)-(c); National Pollutant Discharge Elimination System – Final Regulations To Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities, Final Rule, 69 Fed. Reg. 41576 (July 9, 2004).
[9] N.J.A.C. 7:14A-6.3

OCNGS's current cooling water system causes severe adverse effects to the Forked River, Oyster Creek, and Barnegat Bay marine environments due to impingement, entrainment, thermal discharge, chlorination, radionuclides, and other pollutants. These impacts, which can be substantially minimized by the installation of a closed-cycle cooling system, are described below.

From the outset, it is important to note that an extensive scientific literature review revealed that all available data on impingement and entrainment at the plant are gleaned from studies performed and/or funded by OCNGS in connection with prior applications. OCNGS has not provided any new data in support of its pending NJPDES application.[10] Therefore, there is no new information to substantiate any claim that the environmental impacts of OCNGS are any less lethal (than as found by these earlier studies) or that the impacts have become sufficiently minimal to alleviate the need for technological improvements. However, the information previously submitted by OCNGS provides ample evidence that clearly affirms the ecological need for a closed-cycle cooling system, as required by law (as described in Section II below).

SECTION I: Impacts of Oyster Creek Nuclear Generating Facility on Aquatic Organisms

OCNGS System Overview

OCNGS currently operates using a once-through cooling system (that includes the intake, discharge, and dilution pump systems) in which approximately 1.4 billion gallons of estuarine water pass through daily.[11] In fact, OCNGS discharges more water into Barnegat Bay than any other industrial or commercial user.[12]

Water is drawn into the plant from Barnegat Bay via the Forked River (which leads to the Intake Canal) and released to Oyster Creek (through the Discharge Canal), which discharges back into Barnegat Bay.[13] Discharges from the plant change the salinity, water temperature, and dissolved oxygen levels in and around the facility and release radionuclides that can be detected through the food web.[14] Water is also drawn from Forked River through the dilution pumps to dilute the heated water of Oyster Creek.

The intake canal produces significant flow velocities depending on the number of circulating pumps in operation.[15] The consequence is both impingement and entrainment of aquatic

---

[10] As for any NJPDES permit, NJDEP has the right to require the applicant to undertake any and all ambient water quality or biological studies that it determines necessary to establish appropriate permit limits and conditions. See N.J.A.C. 7:14A-2.12

[11] Assessment of the Impacts of the Oyster Creek Nuclear Generating Station on Kemp's Ridley (*Lepidochelys kempii*), Loggerhead (*Caretta caretta*), and Atlantic Green (*Chelonia mydas*) Sea Turtles. (December 2004), NRC PDR ML# 050060037.

[12] M.J. Kennish, M.B. Roche and T.R. Tatham (1984) Anthropogenic effects on aquatic organisms. In: M.J. Kennish and R.A. Lutz (eds), *Ecology of Barnegat Bay, New Jersey*. NY: Springer-Verlag, pp. 318-338.

[13] M.J. Kennish, (2001) State of the Estuary and Watershed: An Overview. Journal of Coastal Research. SI 32: 243-273.

[14] *Id.*

[15] Assessment of the Impacts of the Oyster Creek Nuclear Generating Station on Kemp's Ridley (*Lepidochelys kempii*), Loggerhead (*Caretta caretta*), and Atlantic Green (*Chelonia mydas*) Sea Turtles. (December 2004), NRC PDR ML# 050060037.

organisms, which may be fatal. Specific environmental impacts related to Barnegat Bay, Oyster Creek, and the Forked River follow.

A. Impingement Impacts:

Impingement occurs when an aquatic organism becomes pinned against screens used at OCNGS by the force of the water entering the cooling water intake or being pulled through the dilution pumps.

Cooling water intake impingements occur when organisms are pinned against the trash racks at the cooling water intake because they are too large to pass through, or when organisms that are small enough to pass through the trash racks are trapped against the "Ristroph screens," by the force of the water entering OCNGS from Forked River. Trash racks are metal grates that remove large debris such as seaweed, grass, or logs, but also trap larger forms of marine life such as endangered sea turtles.

Although the Station installed Ristroph screens to the cooling water intake in 1983, as an improvement to the trash racks, these 9.5 mm screens are an archaic attempt to mitigate impingements. Ristroph Screens rotate constantly, impinging organisms on the mesh. The mesh is then sprayed with water to force the impinged organisms off the screen and into a small tray. The organisms are held in the tray until the screen rises to a point where they are flipped over and dumped onto a trough, which leads to a sluiceway that diverts the organisms to the heated waters of Oyster Creek.

Dilution pump impingements occur when organisms, such as the endangered Kemp's Ridley sea turtle, are pinned against the trash racks at the dilution pumps. There are no Ristroph screens on these pumps.

This process does very little to reduce impingement losses (and does nothing to reduce entrainment losses) at OCNGS. In fact, "the 1989 Versar Report found that none of the screening options reduces losses at the facility by even 50%."[16] Impingements at the dilution pumps and cooling water intake follow.

1) Plant records indicate 32 impingements and 14 mortalities of endangered sea turtles since 1992.[17] These data include the following species-specific incidents:

    a) 21 impinged Kemp's Ridley Sea Turtles with nine (9) mortalities,
    b) Seven (7) impinged Loggerhead Sea Turtles with two (2) mortalities, and
    c) Four (4) impinged Green Sea Turtles with one (1) mortality.

    OCNGS **exceeded their annual incidental take in 2004** when eight (8) juvenile Kemp's Ridley Sea Turtles (of indeterminate sex) were impinged and three (3) were killed in the

[16] NJDEP Fact Sheet on Proposed Permit for OCNGS, p. 12.
[17] Assessment of the Impacts of the Oyster Creek Nuclear Generating Station on Kemp's Ridley (*Lepidochelys kempii*), Loggerhead (*Caretta caretta*), and Atlantic Green (*Chelonia mydas*) Sea Turtles. (December 2004), NRC PDR ML# 050060037.

three-month period from July 4 to September 23. Kemp's Ridley Sea Turtles are the most endangered and most rare sea turtle. The National Marine Fisheries Service (NMFS), under some circumstances, may permit the taking of threatened or endangered fish and wildlife if such taking is "incidental to, and not the purpose of carrying out otherwise lawful activities."[18] An Incidental Take Statement by the National Marine Fisheries authorized an annual take limit of four (4) Kemp's Ridley's (with no more than three (3) mortalities), five (5) Loggerheads (with no more than two (2) mortalities) and two (2) Green's (with no more than one (1) mortality).[19]

Incidental Take Allowances acknowledge and allow for mortality to endangered species. By definition, Incidental Take Allowances do not adequately protect endangered species from harm or death. Additionally, the U.S. Nuclear Regulatory Commission has asked that Incidental Take Allowances be eliminated entirely.[20]

2) A study conducted from September 1975 through August 1977 reported impingement of 13 million fish and invertebrates during this period.[21]

3) A second study conducted from November 1984 through December 1985 reported impingement of 22 million fish and invertebrates (with 7 million impinged in December 1985 alone).[22]

B. Entrainment Impacts:

Entrainment is a usually fatal event whereby smaller aquatic organisms enter OCNGS's cooling water system. Organisms are entrained at the dilution pump and cooling water intake.

Large numbers of organisms are entrained in the cooling water intake system by passing first through trash racks (described above) and then through the 9.5mm Ristroph screens (described above) at the intake canal. The organisms then enter and pass through the entire cooling system. These smaller organisms generally consist of plankton, fish, and invertebrates in the many early life stages. Once sucked into the intake system, entrained organisms are subjected to numerous, and often fatal insults, including:

---

[18] Section 10(a)(1)(B) of the Endangered Species Act, 33 U.S.C. 1539(a)(1)(B).

[19] National Marine Fisheries Service's Biological Opinion on the impact's of Oyster Creek Nuclear Generating Station located near Forked River, New Jersey, on endangered and threatened species. National Marine Fisheries Service, Northeast Regional Office, July 18, 2001

[20] In March 2005, the NRC requested to reinitiate formal consultation, under Section 7 of the Endangered Species Act, for OCNGS. In doing so, the NRC requested a revision to OCNGS's 2001 Incidental Take Statement, stating "[t]he staff believes that the increase in takes is a result of modifications to the Barnegat Bay Inlet and increases in turtle population, not changes in plant design or operating procedures. The NRC believes that this trend of increasing takes will continue." The NRC asked that "there be no restriction on the total number of takes for any species of sea turtle and that the station have limits only on the number of lethal takes causally related to plant operation."

[21] JCPL (1978) Oyster Creek and Forked River Nuclear Generating Stations 316 (a) and (b) Demonstration, Volumes 1-5. Technical Reports, Jersey Central Power and Light Company, Morristown, New Jersey.

[22] EA (1986) Entrainment and Impingement Studies at Oyster Creek Nuclear Generating Station 1984 - 1985. Technical Report, EA Engineering, Science, and Technology, Inc., Sparks, Maryland.

1) Thermal shock from the sudden increase in water temperature between external water temperatures and temperatures inside the Station (12º-13º C / 21.6º-23.4º F).
2) Shear and pressure forces from high water velocity and trapped air.
3) Mechanical stress from contact with machinery, pumps, and other equipment within the system.
4) Lethal levels of chlorine injected daily into the condenser section to reduce biofouling.

Intake Canal Entrainments:

1) A study conducted from September 1975 through August 1977 reported entrainment of 9.19×10^{13} microzooplankton (<500 μm in size including several species of copepods and clam, snail, worm and barnacle larvae) through the intake screens.
2) The same study reported entrainment of 4.24×10^{11} macrozooplankton (>500 μm in size including jellyfish, sand shrimp, grass shrimp, larvae of sandlance and American eels, eggs and larvae of winter flounder, and several crab species) through the intake screens.[23]

Other organisms are entrained in the dilution pump system. Since the dilution pump system is only equipped with trash racks, both small and mid-sized organisms are entrained here. These organisms are pulled into the dilution pump and then spat out into the heated water of Oyster Creek.

Dilution Pump Entrainments:

1) One study reported that 1×10^8 (100 million) organisms were entrained through the dilution pumps from November 1984 through December 1985.[24]

In addition, OCNGS increases water usage (and thus flow and entrainment potential) during the summer months, which coincides with peak concentrations of eggs, larvae, and plankton in the water column.[25] Consequently, increased numbers of organisms are entrained at both the intake canal and the dilution pump during the summer months.

C. Discharges to Oyster Creek and Barnegat Bay:

1. Thermal Plume Impacts

The once-through cooling system used by OCNGS results in an increase in water temperature between the intake and discharge canals, which consequently increases the water temperature of Oyster Creek.[26] Temperature increases are mitigated through use of the dilution pump system.

---

[23] JCPL (1978) Oyster Creek and Forked River Nuclear Generating Stations 316 (a) and (b) Demonstration, Volumes 1-5. Technical Reports, Jersey Central Power and Light Company, Morristown, New Jersey.
[24] M.J. Kennish (2001) State of the Estuary and Watershed: An Overview. Journal of Coastal Research, SI 32: 243-273.
[25] M.J. Kennish, (2001) State of the Estuary and Watershed: An Overview. Journal of Coastal Research. SI 32: 243-273.
[26] M.J. Kennish, (2001) State of the Estuary and Watershed: An Overview. Journal of Coastal Research. SI 32: 243-273.

Cooler water is pumped from Forked River and added to the heated water of Oyster Creek, an attempt to solve heat pollution by dilution. Dilution is not the solution to pollution.

The 1994 and the 2005 Draft Permit allow for a temperature differential of 22ºF (33ºF under special circumstances) between the intake and discharge canal. Water temperature in the discharge canal is permitted to reach 110ºF,[27] which affects the behavior, physiology, and habitat utilization of aquatic organisms in Oyster Creek and Barnegat Bay.[28]

OCNGS's thermal discharge causes the water temperature at the mouth of Oyster Creek (over 1.5 miles away) to rise 3º to 5º C (5.4º to 9.0º F).[29] The thermal plume from OCNGS extends through the mouth of Oyster Creek and into Barnegat Bay for approximately one (1) mile.[30] At times, the plume extends out from the mouth of Oyster Creek and across the entire width of Barnegat Bay to the barrier beach on the other side, a distance of almost four (4) miles.[31]

The elevated temperature in Oyster Creek and the surrounding waters of Barnegat Bay induces behavioral changes that have been documented in important managed species such as bluefish, fluke, winter flounder, and tautogs.[32] Some of these behavioral changes include:

a) Avoidance of parts or all of Oyster Creek by certain species during summer and early fall.[33]
b) Attraction to parts or all of Oyster Creek during winter when they should have migrated out of the area due to cold temperatures. Failure to migrate can lead to large-scale mortality (due to thermal shock) when the plant experiences a planned or emergency shut down.

    (1) Records from January 1972 through December 1982 reported 2,404,496 fish were killed due to thermal shock including Atlantic menhaden, bay anchovy, bluefish, striped bass, and weakfish.[34]

    (2) An emergency shutdown on January 21, 2000 caused a 17ºF drop in the water temperature in the discharge canal in 15 minutes. The rapid drop in temperature to

[27] Effluent limitations and monitoring requirements of the 1994 (most recent) NJPDES/DSW Permit #NJ0005550 for Oyster Creek Nuclear Generating Station, Part III-B/C.
[28] M.J. Kennish, (2001) State of the Estuary and Watershed: An Overview. Journal of Coastal Research. SI 32: 243-273.
[29] M.J. Kennish, (2001) State of the Estuary and Watershed: An Overview. Journal of Coastal Research. SI 32: 243-273.
[30] M.J. Kennish, (2001) State of the Estuary and Watershed: An Overview. Journal of Coastal Research. SI 32: 243-273.
[31] O. Donovan, D. Doyle, C. O'Neill and E. Kearns (1977) Thermal Plume Impact on Fish Distributions in Barnegat Bay. Bull. Amer. Lit. Soc. 10(3): 14.
[32] O. Donovan, D. Doyle, C. O'Neill and E. Kearns (1977) Thermal Plume Impact on Fish Distributions in Barnegat Bay. Bull. Amer. Lit. Soc. 10(3): 14
[33] M.J. Kennish, (2001) State of the Estuary and Watershed: An Overview. Journal of Coastal Research. SI 32: 243-273.
[34] M.J. Kennish, M.B. Roche and T.R. Tatham (1984) Anthropogenic effects on aquatic organisms. In: M.J. Kennish and R.A. Lutz (eds), *Ecology of Barnegat Bay, New Jersey*. NY: Springer-Verlag, pp. 318-338.

32ºF resulted in the death of approximately 3500 fish including 2980 striped bass.[35]

(3) An emergency shutdown on November 11, 2001 caused a 7ºF drop in the water temperature in the discharge canal in 15 minutes. The rapid drop in temperature to 48ºF resulted in the death of approximately 1407 fish.[36]

(4) A scheduled shutdown on September 23, 2002 caused the water in the discharge canal to increase to 101ºF in less than an hour and resulted in the death of approximately 6,000 fish.[37] AmerGen reached a settlement of approximately $1 million dollars over this incident.[38]

c) Metabolic rate of organisms increases with increased temperatures resulting in decreased growth and survival,[39] especially during summer months when ambient water temperatures are at their peak.

d) High water temperature decreases oxygen solubility in water and increases Biological Oxygen Demand ("BOD") resulting in dangerously low dissolved oxygen concentrations in the water.

e) Tropical/subtropical invasive species are able to thrive in the surrounding warm water plume. For example, two exotic shipworms (*Teredo barschi* and *T. furcifera*) have benefited from the elevated temperatures with an increase in growth rate and length of breeding season along with reduced winter mortality, which lead to a population increase that has created problems for boat owners in the vicinity of the plume.[40]

f) Calefaction or thermal loading in the discharge canal and Oyster Creek directly interferes with physiological processes of biota, such as enzyme activity, feeding, reproduction, respiration, and photosynthesis. Less conspicuous, indirect effects, which are difficult to quantify, include greater vulnerability to disease, to changing gaseous solubilities, and to chemical toxicants associated with thermal enrichment.[41]

---

[35] Oyster Creek Nuclear Generating Station Fish Kill Monitoring Report (January 2000) NRC ML#003684420
[36] Oyster Creek 2001 Annual Environmental Operating Report (February 2002) NRC ML#020660222
[37] A. Cradic, Oyster Creek Generating Station fined for water violations and fish kills: DEP seeks compensation for Natural Resources Damages New Jersey Department of Environmental Protection news release (December 12, 2002), *available for viewing at* http://www.state.nj.us/dep/newsrel/releases/02_0131.htm
[38] P.C. Harvey, New Jersey reaches $1 million dollar settlement with owner of Oyster Creek Nuclear Power Plant regarding fish kills caused by thermal discharge. New Jersey Office of the Attorney General news release (April 8, 2004), *available for viewing at* http://www.state.nj.us/dep/newsrel/2004/04_0408ag.htm
[39] T. L. Beitinger, W. A. Bennett, R. and W. McCauley, (2000) Temperature Tolerances of North American Freshwater Fishes Exposed to Dynamic Changes in Temperature. Environmental Biology of Fishes, 58(3):237 – 275.
[40] M.J. Kennish (2001) State of the Estuary and Watershed: An Overview. Journal of Coastal Research, SI 32: 243-273.
[41] M.J. Kennish, (2001) State of the Estuary and Watershed: An Overview. Journal of Coastal Research. SI 32: 243-273.

2. Chlorine Impacts to Organisms in the Station and Organisms in Oyster Creek and Barnegat Bay:

Chlorine is injected through each of the circulating pumps daily to prevent and remove fouling organisms such as bacteria.[42] Maximum chlorination occurs in the summer months to account for more rapid growth of fouling organisms. [43] To their detriment, fish, fish eggs and larvae, invertebrates, and zooplankton are most abundant during this time of increased chlorination. Chlorine related impacts include:

a) Chlorine directly kills phytoplankton and zooplankton entrained in the cooling system and can impact organisms residing in Oyster Creek and surrounding waters.

(1) Chlorine begins to be lethal to marine organisms at 0.01 mg/L[44] but tolerance is significantly lowered by high temperatures and physiological condition of the organisms.[45]

(2) OCNGS has a permitted daily maximum discharge limit of 0.20 mg/L of chlorine produced oxidants (CPOs)[46] into the discharge canal, 20 times higher than the lethal chlorine limit of many estuarine organisms including striped bass, mummichogs, and bunker.[47,48] One chlorine related fish kill resulted in the death of 500 Atlantic Menhaden in January of 1974.[49]

(3) Toxic residual organic compounds (chloramines), a byproduct of chlorination, persist in the discharge canal and effluent resulting in long-term exposure to fish and other aquatic organisms residing in the canal and plume area of Oyster Creek and Barnegat Bay.[50]

---

[42] Assessment of the Impacts of the Oyster Creek Nuclear Generating Station on Kemp's Ridley (*Lepidochelys kempii*), Loggerhead (*Caretta caretta*), and Atlantic Green (*Chelonia mydas*) Sea Turtles. (December 2004), NRC PDR ML# 050060037.

[43] M.J. Kennish (2001) State of the Estuary and Watershed: An Overview. Journal of Coastal Research, SI 32: 243-273.

[44] J.S. Mattice and H.E. Zittel (1976) Site-specific evaluation of power plant chlorination. Journal of Water Pollution Control Federation, 48: 2284-2292.

[45] L.W. Hall Jr., D.T. Burton and S.L Margrey (1981) Acclimation temperature: an important factor in power plant chlorination studies with larval white perch, *Morone americana*. Journal of Toxicological and Environmental Health. 7(6): 941-950.

[46] Effluent limitations and monitoring requirements of the 1994 (most recent) NJPDES/DSW Permit #NJ0005550 for Oyster Creek Nuclear Generating Station, Part III-B/C.

[47] J.S. Mattice and H.E. Zittel (1976) Site-specific evaluation of power plant chlorination. Journal of Water Pollution Control Federation, 48: 2284-2292.

[48] W.P. Davis and D.P. Middaugh (1977) A revised review of the impact of chlorination processes upon marine ecosystems: update 1977. In: R.L Jolley (eds) *Water Chlorination: Environmental Impact and Health Effects-Volume 1*, Ann Arbor Science, Ann Arbor, Michigan, pgs. 283-310.

[49] M.J. Kennish (2001) State of the Estuary and Watershed: An Overview. Journal of Coastal Research, SI 32: 243-273.

[50] Ambient Water Quality Criteria for Chlorine (January 1985), USEPA 440/5-84-030, 57 pgs.

3. Radionuclide Impacts:

Radionuclides bioaccumulate through-out the estuarine food web. Reactor-released radionuclides from OCNGS have accumulated in bottom sediments and the estuarine biota since December 1969 when the facility commenced operation.[51] Reactor-released radionuclides (^{60}Co, ^{137}Cs, ^{54}Mn) have been detected in water, bottom sediments, benthic marine algae, seagrass, hard clams, blue crabs, bunker, winter flounder, summer flounder, bluefish, and several other fish.[52] Organisms collected near Oyster Creek had the highest levels of radionuclides but detectable levels were found through out the bay.[53] Recent sediments collected near the discharge canal contained levels of ^{60}Co that were up to 63 times higher than sediments collected at other locations within the Barnegat Bay-Little Egg Harbor estuary.[54]

4. Petroleum, Total Dissolved Solids, and Total Suspended Solid Impacts:

The current NJPDES permit for OCNGS provides that a maximum daily limit of 15 ppm of petroleum hydrocarbons that can be discharged from five (of seven) of their outfall pipes.[55] The sources of this contaminant are not clear, [56] however, petroleum hydrocarbons are harmful to marine life.

It is likely that small concentrations of sediments and other solids are sucked through and discharged from OCNGS. Depending on the amount, total suspended solids (TSS) and total dissolved solids (TDS) can have negative impacts due to increased turbidity and solids concentrations in surrounding waters. After forty (possibly sixty, should the license be renewed) years of operation, TSS and TDS can have significant adverse affects on the marine environment, especially if the sediment is contaminated with radionuclides (as mentioned above).

The above individual impacts need to be examined from an ecosystem perspective, including cumulative effects, to fully appreciate the overall effect of OCNGS on the surrounding habitat. For example, survivability of fish populations and their effects on fish stocks and the effects on the ecosystem.

Because of the above demonstrable, significant, adverse impacts to the waters of New Jersey and their resources, which are protected by law, OCNGS' antiquated once-through cooling system must be replaced with a closed-cycle cooling system. Exelon cannot demonstrate that they can continue to operate a once-through cooling system without the above impacts. The abuse of the Forked River, Oyster Creek, and Barnegat Bay waters must be eliminated.

---

[51] M.J. Kennish (2001) Characterization of the Barnegat Bay-Little Egg Harbor Estuary and Watershed. Journal of Coastal Research, SI 32: 3-12.

[52] M.J. Kennish (2001) Characterization of the Barnegat Bay-Little Egg Harbor Estuary and Watershed. Journal of Coastal Research, SI 32: 3-12.

[53] R.L. Blanchard and B. Kahn (1979) Abundance and distribution of radionuclides discharged from a BWR nuclear power station into a marine bay. Nuclear Safety 20: 190-205.

[54] F.C. Moser and R.F. Bopp (2001) Particle-associated contaminants in the Barnegat Bay-Little Egg Harbor Estuary. Journal of Coastal Research, SI 32:229-242.

[55] Effluent limitations and monitoring requirements of the 1994 (most recent) NJPDES/DSW Permit #NJ0005550 for Oyster Creek Nuclear Generating Station, Part III-B/C.

[56] COA will be investigating this further.

SECTION II: THE DRAFT NJPDES PERMIT

A. Cooling Water Intake Structures and the Section 316(b) Mandate

Section 316(b) of the Clean Water Act mandates that OCNGS upgrade its cooling water intake structures to minimize adverse environmental impacts.[57] This federal mandate, in combination with NJ State regulations, legally obligates the State to mandate the installation of a closed-cycle cooling system. Such an upgrade will dramatically reduce OCNGS's water withdrawals from Forked River and discharges into Oyster Creek and Barnegat Bay to a point, in a manner that would eliminate or significantly reduce the current adverse impacts. Consequently, the ecosystem would benefit greatly.

In its new Phase II Rule, the U.S. Environmental Protection Agency recognized closed-cycle cooling as a means by which an existing facility can achieve compliance with Section 316(b) of the federal Clean Water Act.[58] However, the Phase II Rule also includes four other alternatives for compliance with 316(b), which have been heavily criticized (and are now being challenged by several states, including the State of New Jersey, and numerous environmental groups) for allowing existing facilities to achieve compliance through means that do not require significant structural upgrades, such as through habitat restoration.[59]

Regrettably, the draft permit affords OCNGS a choice between two distinctly different alternatives for purportedly achieving compliance with the Section 316(b) mandate. The first ("Alternative 1") is to "reduce intake capacity to a level commensurate with the use of a closed cycle, recirculating cooling system." Practically speaking, Alternative 1 would require OCNGS to convert from a once-through to a closed-cycle cooling system. The second alternative ("Alternative 2") is compliance with impingement and entrainment performance standards, together with wetlands restoration of approximately 350 to 3500 acres.

For the reasons set forth below, the Undersigned Parties strongly support Alternative 1.

1. The Undersigned Parties strongly support the Department's Preferred Alternative (Alternative 1), as it would require OCNGS to implement a closed-cycle cooling system that would, in compliance with State and federal law, greatly reduce the present harm caused by OCNGS to Forked River, Oyster Creek, and Barnegat Bay and is the only approach (as recognized by the Department) through which OCNGS can meet the standard of BTA.

Section 316(b) of the federal Clean Water Act requires that the "**location, design, construction, and capacity of cooling water intake *structures* reflect the *best technology available for***

[57] 33 U.S.C. § 1326(b)-(c); CWA § 316(b)-(c).
[58] National Pollutant Discharge Elimination System – Final Regulations To Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities; Final Rule, 69 Fed. Reg. 41590 (July 9, 2004)
[59] See e.g., 40 CFR 125.94.

minimizing adverse environmental impact" (emphasis added).[60] This is the highest and most current technology-based requirement of the CWA, and requires the mandated technology to represent the "best" technology in ecological terms that is "available" from an engineering and financial perspective.[61]

Closed-cycle Cooling Meets the "Best" Standard

It is well established that closed-cycle cooling is the "best" technology because it is required for new plants but also because, as the Department has recognized, it is "the only cooling water intake structure technology available to [OCNGS] to reduce entrainment."[62] Closed-cycle cooling would drastically reduce the amount of water (and species) withdrawn from Forked River by OCNGS. A wet closed-cycled cooling system would reduce the amount of water withdrawn by the OCNGS by as much as 96%.[63] The mortality of species entrained by OCNGS would be reduced by approximately that same percentage. By way of example, where certain once-through cooling systems entrain 3.65 million organisms per year, replacing that system with a closed-cycle cooling system would reduce the number of organisms entrained to as low as 180,000 organisms.[64] This dramatic reduction does not even account for the number of organisms spared from thermal shock, impingement, and polluted discharge by the closed-cycle cooling system. One study has found that the conversion from a once-through cooling system to a closed-cycle cooling system reduced fish impingement by over 95%.[65]

Closed-cycle Cooling Meets the "Available" Standard

Closed-cycle cooling is certainly "available," since all new facilities are required to install closed-cycle cooling systems.[66] Additionally, 73 of the 539 existing power plants subject to EPA's new Phase II Rule already have implemented this technology by converting from once-through to closed-cycle systems.[67]

The financial "availability" of BTA is determined using a "reasonableness" standard and not on a cost-benefit basis.[68] The fact that closed-cycle cooling involves additional costs to existing power plants is not adequate reasoning to eliminate it as the Best Technology Available because

---

[60] 33 U.S.C. § 1326(b); CWA § 316(b).

[61] See e.g., 33 U.S.C. § 1314(b)(2)(B) (1982); Rybachek v. U.S. Envtl. Protection Agency, 904 F.2d 1276 (9th Cir. 1990) (By definition, BAT limitations must be both technologically available and economically achievable).

[62] NJDEP Fact Sheet on Proposed Permit for OCNGS, p. 12.

[63] EPA, Phase II Rule Technical Development Document, at 4-1 (available at www.epa.gov/ waterscience/316b/devdoc/ ch4.pdf).

[64] Riverkeeper, Inc. v. U.S. Envtl. Protection Agency, 358 F.3d 174, 195 fn. 22 (2d Cir. 2004).

[65] Benda, Robert S., et al., Comparison of Fish Impingement at the Palisades Nuclear Power Plant for Once-Through and Closed Cycle Cooling, Indiana Academy of Science (Vol. 85, 1975)

[66] Palisades Nuclear Generating Plant in Michigan, Jefferies Coal Units 3 & 4 in South Carolina, and Canadys Steam Plant in South Carolina. A fourth plant (Pittsburgh Power Plant in California) converted its recirculating spray canal cooling system to a closed-cycle cooling tower system in 1976. EPA, Phase II Rule Technical Development Document, Chapt. 4 (available at www.epa.gov/waterscience/316b/devdoc/ ch4.pdf).

[67] EPA, Phase II Rule Technical Development Document, Chapt. 4 (available at www.epa.gov/ waterscience/316b/devdoc/ ch4.pdf).

[68] EPA v. National Crushed Stone, 449 U.S. 64 (1980) (EPA need not compare the cost of a BAT with the benefits of effluent reduction); Rybachek v. U.S. Envtl. Protection Agency, 904 F.2d 1276 (9th Cir. 1990) (with regard to a determination on BAT, EPA has considerable discretion in weighing the technology's costs).

"some amount of economic disruption [is] contemplated as a necessary price to pay in the effort the clean up the nation's waters."[69] Furthermore, as recently recognized by the State,

> "[w]hile cost is usually the greatest impediment to implementing any new technology, Congress has already taken this into account in drafting the statute: [Congress'] regulatory scheme is structured around a series of increasingly stringent technology based standards . . . it is **technology forcing** . . . The essential purpose of this series of progressively more demanding technology-based standards was not only to stimulate but to press development of new, more efficient and effective technologies. This policy is expressed as a **statutory mandate**, not simply as a goal."[70]

It is indisputable that closed-cycle cooling is the best technology available to OCNGS, and therefore, the Undersigned Parties support Alternative 1 and believe it to be the only appropriate and legal alternative under federal law.

Moreover, federal and State laws allow the Department to impose requirements that are more stringent than those that are federally mandated, where necessary to protect the environment. In the preamble to its proposed and final Phase II Rule, EPA recognized:

> "[a] State may choose to use its own authorities to require dry cooling in areas where the State finds its fishery resources need additional protection above the levels provided by the technology-based minimum standards,"

and

> "[u]nder the Clean Water Act Section 510, a State may choose to impose more stringent standards than required by Federal regulations. States may continue to use this authority to require facilities to use dry or wet cooling systems."[71]

Thus, states with the delegated authority to execute the CWA, like New Jersey, can implement standards more stringent than EPA in accordance with Section 510 of the CWA.[72] In addition, states are "free to force technology . . . even at the cost of economic and social dislocations caused by plant closings . . . "[73] Accordingly, the Department is effectively authorized to mandate closed-cycle cooling even though the Phase II Rule contains other alternatives. New Jersey statutory and regulatory authorities expressly allow the Department to include permit conditions deemed necessary to protect public health and/or the environment. For example, the State Water Pollution Control Act (WPCA) specifically provides that any NJPDES permit issued by the Department may contain, in addition to all State or federally mandated effluent limitations,

---

[69] American Iron & Steel Inst. v. EPA, 526 F.2d 1027, 1052 (3d Cir. 1975).
[70] States Brief at 35, citing NRDC v. EPA, 822 F.2d 104, 123 (D.C. Cir. 1987)(emphasis added; citations omitted).
[71] 67 FR 17168 (2002); 69 FR 41609 (2004).
[72] 33 U.S.C. § 1370.
[73] See United States Steel Corp. v. Train, 556 F. 2d 822, 838 (7th Cir. 1977).

> "such further discharge restrictions and safeguards against unauthorized discharge as may be necessary to meet water quality standards, area wide plans adopted pursuant to law, and other legally applicable requirements."[74]

This broad authority allows the Department to require closed-cycle cooling as a condition of the subject NJPDES permit to safeguard against the taking of endangered species, massive fish kills induced by thermal shock, and other violations of applicable legal requirements previously committed by this facility.

Furthermore, under the WPCA, the State has also adopted regulations that authorize the Department to impose conditions it deems necessary on a case-by-case basis. In pertinent part, the WPCA regulations provide that NJPDES permits must require the implementation of "Best Management Practices" (BMP) if "reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the State and Federal Acts."[75] BMP is broadly defined to include "structural controls."[76] Since the purposes of the WPCA and the CWA include the protection of fish and aquatic life,[77] and because Section 316(b) requires structural upgrades, such as closed-cycle cooling, the Department has the statutory ability to require the implementation of closed-cycle cooling for OCNGS.

The WPCA regulations further state that in addition to the prescribed mandatory permit conditions, the Department "shall establish conditions in the permit for the individual programs, as required on a case-by-case basis."[78] Given the history of massive aquatic life mortality and other environmental insults caused by OCNGS, it is clear that closed-cycle cooling is necessary and essential to protect fish and aquatic life in accordance with the CWA and WPCA, in this case.

2. Alternative 2 is objectionable because it would allow OCNGS to avoid implementation of a closed-cycle cooling system and to continue killing significant amounts of marine life by impingement, entrainment, thermal shock, and chlorinated/toxic discharges.

Alternative 2 states,

> *If the permittee can demonstrate that Alternative 1 is unavailable to this facility, the Department will allow the permittee to select, install, properly operate and maintain a combination of design and construction technologies, operational measures, and/or restoration measures that will, in combination with any existing design and construction technologies, operational measures, and/or restoration measures, meet the following national performance standards:*

---

[74] N.J.S.A. 58:10A-6(f)(1). See also, In the Matter of Vineland Chem. Co., 243 N.J. Super. 285 (App. Div. 1990) (under N.J.S.A. 58:10A-6f(1), DEP was justified in denying a groundwater permit for non-contact cooling water that it determined would could well pose a danger to the public health and the environment, and would otherwise be contrary to the expressed policy of the State WPCA).

[75] N.J.A.C. 7:14A-6.2

[76] N.J.A.C. 7:14A-1.2.

[77] N.J.S.A. 58:10A-2; 33 U.S.C. 1251(a).

[78] N.J.A.C. 7:14A-6.3

Impingement Mortality Performance Standard – Reduce impingement mortality for all life stages of fish and shellfish by 80 to 95 percent from the calculation baseline.[79]

Entrainment Performance Standard – Reduce entrainment for all life stages of fish and shellfish by 60 to 90 percent from the calculation baseline.

In addition to compliance with the national performance standards, the permittee shall initiate a wetlands restoration and enhancement program of a minimum of 350 acres within the Barnegat Bay estuary to offset any residual impingement and entrainment losses at the facility to realize benefits as soon as possible.[80]

The Undersigned Parties are convinced that the above reductions to impingement and entrainment **cannot** be achieved without the installation and implementation of closed-cycle cooling, particularly because the Department has recognized that "closed-cycle cooling is the only cooling water intake structure technology available to the facility to reduce entrainment."[81] Moreover, the Undersigned Parties do not believe that the performance of lesser measures (as evaluated against a **calculated** baseline) will result in any **actual** reductions in mortalities caused by impingement and entrainment. Because Alternative 2 would not require OCNGS to use current, documented levels of impingement and entrainment mortality as the baseline for its compliance with the new performance standards, it is entirely possible that OCNGS will calculate a baseline that does not require any changes to its facility (and therefore, no actual reductions in fatalities caused by OCNGS). Given the severe environmental impacts of OCNGS set forth in Section 1 above, restoration is an unacceptable alternative.

In addition, even if such mortality reductions were realized, Alternative 2 is the inferior choice because it would do nothing to abate the occurrences of thermal shock and mortalities due to discharges of chlorine and other pollutants.

Particularly when compared to the certain and substantial improvements of closed-cycle cooling, the inadequacy of Alternative 2's performance standards is not cured by the additional requirement of restoration. Regardless of the amount of restoration that would also be required under Alternative 2, the Undersigned Parties believe that restoration is not an adequate (or legal) substitute for technological improvements that would significantly and demonstrably **prevent** the loss of marine life. The State of New Jersey is presently arguing this very point to the Second Circuit Court of Appeals in its pending challenge to the validity of the Phase II Rule. On the issue of restoration, the State has asserted the position that"[r]estoration measures cannot be substituted for technological measures at intake structures because they do not minimize adverse impacts caused by those structures."[82]

---

[79] The calculation baseline means an estimate of impingement mortality and entrainment that would occur on-site assuming a shoreline cooling water intake structure with an intake capacity commensurate with a once-through cooling water system and with no impingement and/or entrainment controls.
[80] NJDEP Fact Sheet on Proposed Permit for OCNGS, at 12.
[81] NJDEP Fact Sheet on Proposed Permit for OCNGS, at 12.
[82] States' Brief at 18-19, fn. 15.

The Undersigned Parties strongly support this argument and urge the Department to act in accordance with this reasoning by requiring OCNGS to comply with Alternative 1. Moreover, the U.S. Court of Appeals for the Second Circuit has already held that restoration measures are "plainly inconsistent with the Section 316(b) mandate to 'minimize adverse environmental impact' by regulating the 'location, design, construction, and capacity of cooling water intake structures."[83] The Second Circuit expressly found that restoration measures "have nothing to do with the location, the design, the construction, or the capacity of cooling water intake structures, because they are unrelated to the structures themselves."[84] Likewise, by placing reliance upon restoration measures, Alternative 2 does not meet the legal requirements of Section 316(b) for existing facilities and must be withdrawn. Compliance with Section 316(b) requires a state-of-the-art technological upgrade to the intake structures of OCNGS, such as installation of a closed-cycle cooling system.

While the restoration of wetlands and aquatic habitat certainly has merit and value in the context of replacing lost habitat, this is not a permit to address lost habitat. The Undersigned Parties are unaware of any scientific authority supporting the notion that restoration alone can offset the continued, dramatic loss of marine life due to impingement and entrainment by once-through cooling systems. EPA certainly does not seem convinced that restoration measures have such potential. When the Phase II Rules were first published, EPA sought,

> "comment on how it may measure the success or failure of restoration activities *given the high degree of uncertainty associated with many areas of this developing science* and that many of these activities do not produce measurable results for many months or years after they are implemented"(emphasis added).[85]

In requesting this information, clearly, the EPA believes the science of habitat restoration has not advanced to the point where one can predict the benefits to individual species in such a way that would legitimize the use of restoration to offset fatalities, particularly of the magnitude caused by OCNGS.

The State of New Jersey also seems unconvinced that restoration can offset the continued, dramatic loss of marine life due to impingement and entrainment. In a July 2004 press release, NJDEP Commissioner Bradley M. Campbell admonished EPA to "go back to the drawing board and design a rule that mandates the use of existing, cost efficient technology by power plants so that we properly protect our country's waterways and fisheries." Similarly, in the litigation pending before the Second Circuit, the State has taken the position that there is no "factual or scientific basis to assume that restoration measures will actually work to minimize the impacts of impingement and entrainment much less meet the [Phase II] Rule's performance standards."[86]

Furthermore, our own literature review has not revealed scientific studies that demonstrate an exact, positive causal relationship between habitat restoration and population increases in a given estuary system. A report on the marsh restoration project conducted by PSE&G in conjunction

---

[83] Riverkeeper, Inc. v. U.S. Envtl. Protection Agency, 358 F.3d 174, 189 (2d Cir. 2004).
[84] *Id.*
[85] 67 Fed. Reg. 17,122, 17147 (Apr. 9, 2002).
[86] States' Brief at 29.

with the Salem Nuclear Power Plant found that "[b]ased upon the limited data available, there does not appear to be an increase in baywide abundance of fishes since PSE&G completed the marsh restoration and fish ladder installation."[87]

Even if such a basis exists, the Draft Permit would appear to allow the effectiveness of restoration measures to be presumed based upon compliance with a "Restoration Plan" rather than actual biological data on marine organism populations. In doing so, Alternative 2 results in the failure to require OCNGS to substantiate actual compliance with the Phase II impingement and entrainment reduction standards. This is unacceptable to the Undersigned Parties because the public would apparently have to guess as to whether the restoration measures were actually effective in offsetting species loss (at the Phase II performance standards) in terms of quantity, diversity, life-stage, and appropriateness. Accordingly, the verifiable technology-based requirements of Alternative 1 are far more credible, as opposed to the speculative, uncertain results that Alternative 2's restoration measures may or may not produce.

Other Compliance Alternatives <u>Are Not Acceptable</u>

The Department should disregard any of the other non-structural, federal compliance "alternatives" because any alternative to the installation of a closed-cycle cooling system is an arbitrary and unlawful regulatory loophole since non-structural alternatives do not address the Section 316(b) requirement to upgrade the cooling water intake **structures**. For example, the Undersigned Parties note with particular disdain, Federal Alternative 5, the implementation of which might allow OCNGS to evade implementing BTA by meeting a lenient, cost-based threshold. The fifth compliance alternative exempts an existing facility from implementing BTA where the facility can demonstrate "that its costs of compliance would be significantly greater than the costs considered by the Administrator for a like facility to meet the applicable performance standards, or than the benefits of meeting the applicable performance standards at the facility."[88] This fifth alternative is especially inconsistent with the CWA and federal case law regarding site-specific determinations for compliance.[89]

B. Dilution Pumps

The Undersigned Parties support the Department's requirement that the dilution pumps also be required to reduce impingement and entrainment impacts according to the Phase II Rule.[90] "Although the permittee contends that the design of these pumps allows for some impingement and entrainment survivability, these pumps are not currently equipped with any other impingement mortality or entrainment controls."[91] All three of OCNGS's dilution pumps should be subject to the Section 316(b) requirements, because they are an additional source of

---

[87] Carpenter Environmental Associates, Inc., "Evaluation of Special Conditions Contained in Salem Nuclear Generating Station NJDPES Permit to Restore Wetlands, Install Fish Ladders, and Increase Biological Abundance within the Delaware Estuary," p.51, Dec. 2003.

[88] 40 C.F.R. §125.94(a)

[89] States' Brief at 47, <u>citing American Iron & Steel Inst. v. EPA</u>, 526 F.2d 1027, 1052 (3d Cir. 1975).

[90] The current permit does not require that the dilution pumps reduce impingement and entrainment impacts. Currently, the water is sucked through dilution pumps without passing through intake screens or any other protective measure.

[91] NJDEP Fact Sheet at 6.

impingement and entrainment mortalities. To that end, installation of a closed-loop system will nearly eliminate the impingement and entrainment impacts of the dilution pumps.

C. Thermal Variance

The Undersigned Parties do not support the thermal variance proposed in the Draft NJPDES Permit. As described in Section I(C) above, the thermal discharges from OCNGS have caused a number of substantial fish fatalities and otherwise continue to adversely impact fish and aquatic organisms in Oyster Creek and Barnegat Bay.

Moreover, a thermal variance is allowed **only** if demonstrated to "assure the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife" in the receiving water.[92] The following review of the facts provides support for the Undersigned Parties position that OCNGS should **not** be granted a variance from the State's water quality standards for thermal discharges.

The proposed thermal variance renewal would excuse OCNGS from complying with the Department's Surface Water Quality Standards. These standards would prevent OCNGS's discharges from raising the temperatures of Oyster Creek and Barnegat Bay:

1) by more than 2° C (4° F) from September through May,
2) by more than 0.8° C (1.5° F) from June through August, and
3) above 85°F.[93]

By contrast, under the proposed thermal variance, OCNGS can raise the temperature of these waters:

1) by as much as 12.8° C (23° F) under normal circumstances,
2) by as much as 18.3° C (33° F) under special circumstances,
3) up to 97° F without remedial action or penalty, and
4) above 97° F without any mandatory penalty.

As stated previously, when temperatures rise into the 100s over short periods, marine organisms die. Clearly, these thermal requirements of the Draft Permit are far more lenient than the applicable State Water Quality Standards. It is unclear how the proposed thermal variance would "assure the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife" because OCNGS's thermal discharge has had substantial adverse impacts on the shellfish, fish, and wildlife in Oyster Creek and Barnegat Bay (see Section I(C) above).

The Undersigned Parties are further concerned with the location and extent of the "heat dissipation area," in which ambient water temperatures can be increased by the OCGNS discharge without any apparent limit. While the maximum extent of a heat dissipation area is

[92] CWA § 316(a), 33 U.S.C. 1326(a).
[93] NJDEP Fact Sheet at 6; N.J.A.C. 7:9B-1.14(c).

restricted by regulation,[94] there is nothing in the Draft Permit to indicate the actual location or extent of the heat dissipation area. Therefore, a clear delineation of this area must be provided. For instance, it is unclear where the heat dissipation area is located in relationship to the Route 9 Bridge, which is referenced in the Draft Permit as a sampling location. Moreover, the Undersigned Parties cannot determine how the location and extent of heat dissipation area comports with the general location and extent of the thermal plume that emanates from OCGNS. This information should be provided to the public.

Finally, the Undersigned Parties note that the adverse impacts caused by thermal discharges from OCGNS would be nearly eliminated by the implementation of a closed-cycle cooling system. Closed-cycle cooling systems discharge approximately 95% less water[95] and therefore are not capable of impacting ambient water temperatures to the extent OCNGS's present system does. If a closed-cycle cooling system were implemented, the Undersigned Parties anticipate that OCNGS's thermal discharge could meet the water quality standards established by the Department without a thermal variance that so clearly jeopardizes the marine life of Oyster Creek and Barnegat Bay.

D. Chlorine Limitations

The Undersigned Parties do not support the current limitations for chlorine-produced oxidants (CPOs). OCNGS has a permitted daily maximum discharge limit of 0.20 mg/L of CPOs into the discharge canal .[96] Yet, chlorine begins to be lethal to marine fish at concentrations of about 0.01 mg/L.[97] Moreover, temperature, the presence of other compounds, and the physiological condition of aquatic life appear to affect their tolerance to chlorinated discharge.[98] Thus, the current limit of 0.20 mg/L is at least 20 times higher than the lethal limit of many estuarine organisms, including striped bass, mummichogs, and bunker.[99, 100]

Likewise, the proposed limit for CPOs exponentially exceeds the Department's surface water quality standards established for the protection of aquatic life against acute and chronic effects

---

[94] N.J.A.C. 7:9B-1.14 (heat dissipation areas in SE streams are not to exceed one-quarter of the cross-section and/or volume of the water body at any time, nor can they exceed more than two-thirds of the surface from shore to shore at any time).

[95] EPA, Phase II Rule Technical Development Document, at 4-1 (available at www.epa.gov/ waterscience/316b/devdoc/ ch4.pdf).

[96] Effluent limitations and monitoring requirements of the 1994 NJPDES/DSW Permit #NJ0005550 for Oyster Creek Nuclear Generating Station, Part III-B/C.

[97] J.S. Mattice and H.E. Zittel (1976) Site-specific evaluation of power plant chlorination. Journal of Water Pollution Control Federation, 48: 2284-2292.

[98] L.W. Hall Jr., D.T. Burton and S.L Margrey (1981) Acclimation temperature: an important factor in power plant chlorination studies with larval white perch, *Morone americana*. Journal of Toxicological and Environmental Health. 7(6): 941-950; M.J. Kennish, (2001) State of the Estuary and Watershed: An Overview. Journal of Coastal Research. SI 32: 254.

[99] J.S. Mattice and H.E. Zittel (1976) Site-specific evaluation of power plant chlorination. Journal of Water Pollution Control Federation, 48: 2284-2292.

[100] W.P. Davis and D.P. Middaugh (1977) A revised review of the impact of chlorination processes upon marine ecosystems: update 1977. In: R.L Jolley (eds) *Water Chlorination: Environmental Impact and Health Effects-Volume 1*, Ann Arbor Science, Ann Arbor, Michigan, pgs. 283-310.

(0.013 mg/L and 0.0075 mg/L respectively).[101] Although the Department regulations create an exception to these CPO limits for non-contact cooling water in certain instances,[102] the CPO limit for OCNGS should not exceed 0.013 mg/L because studies have shown that chlorinated discharges, in combination with the numerous adverse impacts caused by OCNGS, constitute a serious threat to life and health of fish and other aquatic organisms in Oyster Creek and Barnegat Bay (see Section 1(D) above). Again, implementation of a closed-loop system will nearly eliminate chlorine impacts.

E. Discharge of Radionuclides, Petroleum Hydrocarbons, Total Dissolved Solids, and Total Suspended Solids

The Draft NJPDES Permit should include measures to protect the marine environment from pollutants historically discharged (or otherwise released) by OCNGS that affect Oyster Creek and surrounding areas, such as radionuclides, petroleum hydrocarbons, total dissolved solids, and total suspended solids.

For example, as mentioned above, reactor-released radionuclides (^{60}Co, ^{137}Cs, ^{54}Mn) have been detected in water, bottom sediments, benthic marine algae, seagrass, hard clams, blue crabs, bunker, winter flounder, summer flounder, bluefish, and several other fish.[103] Organisms collected near Oyster Creek had the highest levels of radionuclides but detectable levels were found through-out the bay.[104] Recent sediments collected near the discharge canal contained levels of ^{60}Co that were up to 63 times higher than sediments collected at other locations within the Barnegat Bay-Little Egg Harbor estuary.[105] Because OCNGS discharges petroleum hydrocarbons, total dissolved solids, and TSS (as described above), the Permit should require limits on TSS, with monitoring for sediment contamination, as well as monitoring for petroleum hydrocarbons

CONCLUSION

OCNGS's antiquated once-through cooling system creates significant, adverse and detrimental impacts to Forked River, Oyster Creek and Barnegat Bay. The operation of the once-through cooling system directly causes the death of trillions of fish and aquatic organisms each year. In

[101] N.J.A.C. 7:9B-1.14 (setting surface water quality criteria for CPOs in saline estuary waters at 0.013 mg/L and 0.0075 mg/L, respectively, to protect against acute and chronic effects to aquatic life).
[102] N.J.A.C. 7:9B-1.6 (water quality-based effluent limits for chlorine produced oxidants [based on the criteria in N.J.A.C. 7:9B-1.14(c)14] are not applicable where: the aquatic community of a waterbody is exposed to one or more point source discharges of non-contact cooling water that is intermittently chlorinated to control condenser biofouling; the total period of such exposure to chlorinated wastewater is two hours per day or less; and the maximum concentration of chlorine produced oxidants in the effluents of such discharges shall not exceed 200 µg/L).
[103] M.J. Kennish (2001) Characterization of the Barnegat Bay-Little Egg Harbor Estuary and Watershed. Journal of Coastal Research, SI 32: 3-12.
[104] R.L. Blanchard and B. Kahn (1979) Abundance and distribution of radionuclides discharged from a BWR nuclear power station into a marine bay. Nuclear Safety 20: 190-205.
[105] F.C. Moser and R.F. Bopp (2001) Particle-associated contaminants in the Barnegat Bay-Little Egg Harbor Estuary. Journal of Coastal Research, SI 32:229-242.

hindsight, the Station is a 20th century mistake. It seems unfathomable that a nuclear power plant would be located in such proximity to one of the nation's most valuable estuaries.[106]

Through this permitting process, the Department has a legal obligation to correct this mistake and require OCNGS to install a closed-cycle cooling system, which would substantially abate the impact of OCNGS upon this estuary. With regard to these structures and Section 316(b) mandate, the Undersigned Parties therefore support Alternative 1 and oppose Alternative 2.

Sincerely,

CLEAN OCEAN ACTION

By: _____
Cindy Zipf, Executive Director

By: _____
Nicole Simmons, J.D. / Water Policy Analyst

By: _____
Jennifer Samson, Ph.D. / Principal Scientist

SAVE BARNEGAT BAY

By: _____
William DeCamp, Executive Director

RUMSON FAIR HAVEN ENV'L CLUB

By: _____
Mary-Beth Thompson

JERSEY COAST ANGLERS ASSOCIATION

By: _____
Tom Fote, Legislative Office Manager

FISHERMAN'S DOCK CO-OP, INC.

By: _____
Jim Lovgren, Representative

GARDEN STATE SEAFOOD ASSOC'N

By: _____
Jeff Reichle, President

AMERICAN LITTORAL SOCIETY

By: _____
Tim Dillingham, Executive Director

By: _____
Leann Foster-Sitar, Esq. / Staff Attorney

NEW JERSEY BEACH BUGGY ASS'N

By:_____
Reb Gilliland

WATERSPIRIT

By: _____
Suzanne Golas

The Thompson Family

By: _____
Mary-Beth Thompson
Rumson, NJ

(cont'd)

[106] Indeed, under modern NRC regulations, which require special precautions for reactors sited proximate to waterways, it is highly unlikely that OCNGS would be located where it is today. See 10 C.F.R. 100.10(c)(3).

Elise Baldwin
Keansburg, NJ

Eugene Creamer
Belmar, NJ

Linda Lees
Monmouth Beach, NJ

Lorraine A. Martin
Manalapan, NJ

Anne Marie Scarrone
Hempstead, NJ