New Jersey Department of Environmental Protection
Division of Water Quality
Bureau of Point Source Permitting - Region 1

FACT SHEET

Masterfile #: 15856 **PI #:** 46400

This fact sheet sets forth the principle facts and the significant factual, legal, and policy considerations examined during preparation of the draft permit. This action has been prepared in accordance with the New Jersey Water Pollution Control Act and its implementing regulations at N.J.A.C. 7:14A-1 et seq. - The New Jersey Pollutant Discharge Elimination System.

PERMIT ACTION: Surface Water Renewal Permit Action

1 Overview of Draft Renewal Permit:

The permittee has applied for a New Jersey Pollutant Discharge Elimination System (NJPDES) Surface Water Renewal Permit Action through an application dated June 3, 1999. Until such time as this renewal permit is finalized, the existing permit remains in full force and effect pursuant to N.J.A.C. 7:14A-2.8.

This draft permit renewal proposes to authorize the intake of waters from Forked River as well as the discharge of wastewater to both Forked River and Oyster Creek. This draft permit renewal incorporates the New Jersey Department of Environmental Protection's (hereafter "the Department") determination with respect to the permittee's request for a thermal variance from surface water quality standards (SWQS) for heat and temperature pursuant to Section 316(a) of the Federal Clean Water Act. Further, this draft renewal permit incorporates the Department's determination pursuant to Section 316(b) of the Clean Water Act and implements the newly effective Federal regulations for Section 316(b) of the Clean Water Act for Phase II facilities.

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2 Name and Address of the Applicant:

AmerGen Energy Company, LLC
Oyster Creek Generating Station
Route 9 South, P.O. Box 388
Forked River, NJ 08731

3 Name and Address of the Facility/Site:

AmerGen Energy Company LLC
Oyster Creek Generating Station
Route 9 South, P.O. Box 388
Forked River, Ocean County, NJ 08731

4 Discharge Location Information:

A copy of the appropriate section of a USGS quadrangle map indicating the location of the facility and discharge points is included towards the end of this Fact Sheet. A schematic of the facility's discharges is also included near the end of the fact sheet.

Description of Outfalls of Most Significant Flow (DSN 001A and 005A)

Outfall 001A: Non-Contact Cooling Water (up to 662.4 MGD)			**Outfall 005A: Dilution Water (up to 1123.2 MGD)**	
Receiving Water:	Oyster Creek		Receiving Water:	Oyster Creek
Via :	Discharge Canal		Via :	Discharge Canal
Outfall Configuration:	Submerged pipe		Outfall Configuration:	Submerged pipe
Classification:	SE1		Classification:	SE1
Latitude:	39° 48' 40"		Latitude:	39° 48' 48.9"
Longitude:	74° 12' 00"		Longitude:	74° 12' 28.2"
County:	Ocean		County:	Ocean
Municipality:	Forked River		Municipality:	Forked River
Downstream Confluences:	Barnegat Bay		Downstream Confluences:	Barnegat Bay
Receiving River Basin:	Barnegat Bay		Receiving River Basin:	Barnegat Bay
WMA (a):	13		WMA (a):	13
Watershed:	Forked River/Oyster Creek		Watershed:	Forked River/Oyster Creek
Subwatershed:	Oyster Creek (below Rt 532)		Subwatershed:	Oyster Creek (below Rt 532)
HUC 14 (b):	02040301110050		HUC 14 (b):	02040301110050

Description of Other Outfalls (DSN 002A, 004A, 007A, 008A, 009A)

Outfall 002A: Non-Contact Cooling Water (3.5 MGD)			**Outfall 004A: Non-Contact Cooling Water, Stormwater, Floor Drains (0.06 MGD)**	
Receiving Water:	Forked River		Receiving Water:	Oyster Creek
Via :	Intake Canal		Via :	Discharge Canal
Outfall Configuration:	Submerged pipe		Outfall Configuration:	Submerged pipe
Classification:	SE1		Classification:	SE1
Latitude:	39° 48' 52.9"		Latitude:	39° 48' 47.6"
Longitude:	74° 12' 28.2"		Longitude:	74° 12' 24.9"
County:	Ocean		County:	Ocean
Municipality:	Forked River		Municipality:	Forked River
Downstream Confluences:	Barnegat Bay		Downstream Confluences:	Barnegat Bay
Receiving River Basin:	Barnegat Bay		Receiving River Basin:	Barnegat Bay
WMA (a):	13		WMA (a):	13
Watershed:	Forked River/Oyster Creek		Watershed:	Forked River/Oyster Creek
Subwatershed:	Forked River (below NB including Mid/South Branch)		Subwatershed:	Oyster Creek (below Rt 532)
HUC 14 (b):	02040301110030		HUC 14 (b):	02040301110050

Outfall 007A: Process Wastewater (30 GPD)			Outfall 008A: Intake Screen Washwater (2.4 MGD)	
Receiving Water:	Forked River		Receiving Water:	Oyster Creek
Via :	Intake Canal		Via :	Discharge Canal
Outfall Configuration:	Submerged pipe		Outfall Configuration:	Submerged pipe
Classification:	SE1		Classification:	SE1
Latitude:	39° 48' 50.9"		Latitude:	39° 48' 48.8"
Longitude:	74° 12' 55.1"		Longitude:	74° 12' 27.5"
County:	Ocean		County:	Ocean
Municipality:	Forked River		Municipality:	Forked River
Downstream Confluences:	Barnegat Bay		Downstream Confluences:	Barnegat Bay
Receiving River Basin:	Barnegat Bay		Receiving River Basin:	Barnegat Bay
WMA (a):	13		WMA (a):	13
Watershed:	Forked River/Oyster Creek		Watershed:	Forked River/Oyster Creek
Subwatershed:	Forked River (below NB including Mid/South Branch)		Subwatershed:	Oyster Creek (below Rt 532)
HUC 14 (b):	02040301110030		HUC 14 (b):	02040301110050

Outfall 009A: Fish Sampling Pool Wastewater	
Receiving Water:	Forked River
Via :	Intake Canal
Outfall Configuration:	Submerged pipe
Classification:	SE1
Latitude:	39° 48' 48.6"
Longitude:	74° 12' 27.9"
County:	Ocean
Municipality:	Forked River
Downstream Confluences:	Barnegat Bay
Receiving River Basin:	Barnegat Bay
WMA (a):	13
Watershed:	Forked River/Oyster Creek
Subwatershed:	Forked River (below NB including Mid/South Branch)
HUC 14 (b):	02040301110030

Footnotes:

(a) WMA = Watershed Management Area

(b) HUC 14 = 14 digit Hydrologic Unit Code

5 Description of Facility:

The Oyster Creek Generating Station (Station) operates a nuclear fueled electric generating station (SIC code 4911). The Station is located between the South Branch of the Forked River and Oyster Creek, two tributaries of Barnegat Bay. The facility consists of a single boiling water reactor rated to produce 670 Megawatts. The unit was constructed between December 1964 and September 1969 where operation commenced in December 1969. The Station operates under a license issued by the United States Nuclear Regulatory Commission (US NRC) where this license expires in April 2009. Any extension of such license is subject to the discretion of the US NRC. The expiration of this permit coordinates with the expiration of the US NRC license where this NJPDES/DSW permit will expire on April 30, 2009.

The facility is classified as a major discharger by the Department in accordance with the United States Environmental Protection Agency (EPA) rating criteria. The design intake flow that is subject to Section 316(b) of the Clean Water Act is 1785.6 MGD which is equivalent to the operation of four circulating water pumps (662.4 MGD) and three dilution pumps (1,123.2 MGD). This value was established in a 1966 Stipulation of the State of New Jersey, Department of Public Utilities, Board of Public Utility Commissioners.

6 Description of Intake:

General

Construction of the Oyster Creek Station resulted in the dredging and widening of the Forked River and Oyster Creek and the construction of man-made canals leading from Forked River to the Station (intake canal) and from the Station to Oyster Creek (discharge canal). The shapes of the intake and discharge canal could connect; however, there is a dike that separates the upstream ends of both canals. A map showing the location of both canals is included as page 29 of this Fact Sheet.

The Station utilizes intake water for two primary purposes. The circulating water and service water systems utilizes up to 662.4 MGD for the purposes of cooling the main condenser. The dilution water system utilizes up to 1123.2 MGD for the purposes of mitigating the thermal effects in the discharge canal. These two systems are described in detail below. While Forked River is the primary source of intake water, an additional source of water used for operations is fresh water from an on-site well.

Sanitary wastewater that is generated on site is diverted to the Lacey Township Municipal Utilities Authority.

Circulating Water and Service Water System

Water is withdrawn from Forked River via the Station's Intake Canal. There are four intake pumps with a capacity of 115,000 gallons per minute (gpm) (165.6 MGD). During normal operations, all four pumps each operate continuously at an average flow rate of 662.4 MGD. This intake water is used to cool the main condenser and the turbine building heat exchangers. This cooling water is then discharged through **DSN 001A** into the discharge canal, which joins Oyster Creek and ultimately Barnegat Bay.

The Station's Intake Canal includes two surface water intake structures namely the Circulating Water Intake, which also services flow for the service water system, and the Dilution Water Intake. The Circulating Water Intake is divided into two sections or bays. Each bay contains three cells. Water enters the cells through trash racks where there is one trash rack per cell. The trash racks are constructed of steel, almost vertically positioned bars on 3 inch centers; so that the trash rack slot opening is about 2 ½ inches. After passing through the trash rack, water is drawn through conventional vertical traveling screens (3/8 inch mesh) modified with "Ristroph" type fish buckets fitted to the base of each screen panel. These fish buckets are intended to prevent aquatic organisms that become trapped on the screens from falling back into the screen well and being repeatedly trapped. They also allow organisms to remain in a water filled bucket when the screen panel is rotated above the water surface. A low pressure wash (approximately 10 to 20 pounds per square inch or psi) is applied that it is intended to wash organisms to a fish return system. High pressure sprays (approximately 30 psi) are then utilized to remove debris from the screen. Screens normally rotate continuously at 1.3 cm/sec (2.5 feet per minute) but speeds can increase via manual control. Water passing through the trash racks and traveling screens is withdrawn by circulating or service water system pumps for use as cooling water. The fish return system is routed to the discharge canal which thereby eliminates the possibility that fish can be immediately reimpinged.

Intake screen washwater is discharged via **DSN 008A** where this flow averages approximately 2.4 MGD. The intake screen washwater removes debris and other organic matter from the Station's traveling intake screens, including the screen washwater system strainers, and discharges to the discharge canal without any additives or treatment. The facility has the option of diverting fish and other organisms removed from the traveling screens to a fish sampling pool where the water from such is drained to the Forked River. The discharge from the fish sampling pool is authorized as **DSN 009A** and has not been operational during the existing permit duration.

Dilution Water System

The permittee also pumps water from the Forked River via the intake canal and discharges it directly to the discharge canal via **DSN 005A** without any addition of heat or other pollutants and without treatment. Dilution pump water is withdrawn via one or two of the Station's three dilution pumps and discharged for the purposes of moderating the temperature of the Station's discharge to Oyster Creek and Barnegat Bay. The dilution water system intake structure is divided into three sections or bays where each section contains two cells. Although the permittee contends that the design of these pumps allow for some impingement and entrainment survivability, these pumps are not currently equipped with any other impingement mortality or entrainment controls. Flow varies according to the number of dilution pumps in operation but averages approximately 708 MGD.

The dilution water system intake is located on the west bank of the Intake Canal, across from the cooling water intake. Three low speed (180 revolutions per minute) axial flow pumps with 7 foot impellers with a design capacity of 260,000 gallons per minute each provide water for the dilution water system. Normally two dilution pumps are used during "winter" and "summer" water conditions (as defined in a 1978 stipulation). The dilution water system intake has two trash racks for each of these three pumps.

Fresh water is drawn from the Station fire protection water system and is used for dilution pump lube oil cooling and pump seal water. This water is discharged through DSN 005A at a rate of 0 to 100 gallons per minute (gpm), depending upon the number of dilution pumps in operation. A small, intermittent component of the fire protection water system flow is the discharge from the emergency diesel fire pump heat exchangers. The two emergency diesel fire pumps are required for emergency purposes, such as fire protection and emergency core cooling. Their operation is limited to 163 hours per year. When the pumps are operated, cooling water from the heat exchangers is discharged through 1.5 inch pipes at a rate of approximately 35 gpm. The increase in temperature is about 11 degrees Fahrenheit and no chemicals are added to the discharge. Most of the cooling water flow is drawn into the flow for the fire protection water system and does not flow back to Oyster Creek. Additionally, on an infrequent basis, small quantities of stormwater that may accumulate in a cable vault in the Dilution Pump intake structure are introduced into the dilution water flow.

7 Description of Discharges:

Discharges to the Intake Canal

Approximately 3.53 MGD of wastewater is discharged by the Station to the intake canal via outfalls DSN 002A, DSN 007A and DSN 009A. **DSN 002A** consists of approximately 3.5 MGD of chlorinated non-contact cooling water from the Station's radioactive waste treatment system's heat exchanger and augmented off-gas heat exchanger. **DSN 007A** consists of approximately 30 GPD of dilution pump seal wastewater, which is treated by an oil/water separator prior to discharge. As described previously, **DSN 009A** is the discharge from the fish sampling pool and is operated on an as needed basis.

Discharges to the Discharge Canal

Approximately 1326 MGD of non-contact cooling water and wastewater is discharged to the discharge canal. **DSN 001A** typically consists of 592 MGD of once through non-contact cooling water from the previously described circulating water and service water system. This water is used to cool the main condenser prior to discharge through the discharge canal. This non-contact cooling water is chlorinated to protect the heat exchanger tubes from marine and organic fouling. The main condenser consists of six sections among which the flow is equally divided. The chlorination injection system (sodium hypochlorite) is designed so that each condenser section is separately chlorinated. Only one section is chlorinated at a time so that the sections are consecutively chlorinated for 20 minutes each during the daily cycle for a maximum of two hours per day of chlorination. The water then passes through the steam condensers and is discharged through DSN 001A.

The Station discharges other wastewater via outfalls DSN 004A, DSN 005A, and DSN 008A to the discharge canal. **DSN 004A** consists of approximately 60,000 GPD of low volume wastewater that includes stormwater, non-contact cooling water from reactor building and emergency service water heat exchangers, laboratory and sampling streams, and various floor drains which emanate from sumps. As described previously, **DSN 005A** is the discharge of approximately 732 MGD (on average) of dilution pump water and **DSN 008A** is the discharge of approximately 2.4 MGD of intake screen washwater.

Stormwater Discharges

The existing permit contains requirements for outfalls DSN 012A, DSN 013A, and DSN 014A which discharge stormwater from sedimentation basins to the South Branch of the Forked River. These discharges are located on a portion of the site that was retained by First Energy when the Station was sold to AmerGen Energy Company, LLC after the existing permit became effective. These outfalls are currently regulated under a general stormwater permit issued to First Energy and therefore are being removed from this permit action.

8 Determinations under Sections 316(a) and (b) of the Clean Water Act:

A. Section 316(a) Determination

1. Regulatory Background - Thermal Surface Water Quality Standards (SWQS) and Section 316(a)

Surface Water Quality Standards (SWQS) for SE1 waters are established in N.J.A.C. 7:9B-1.1 et seq. and are applicable to the Barnegat Bay, Forked River, and Oyster Creek. These standards require that ambient water temperatures in the receiving waters shall not be raised by more than 2.2° C (4° F), from September through May, nor more than 0.8 ° C (1.5 ° F) from June through August, nor cause temperatures to exceed 29.4 ° C (85 ° F), except in designated heat dissipation areas. SWQS provide that "heat dissipation areas" in "streams" (including SE waters) shall not exceed one-quarter (1/4) of the cross section and/or volume of the water body at any time; nor more than two-thirds (2/3) of the surface from shore to shore at any time. SWQS further provide that these "heat dissipation areas" limits:

> "...may be exceeded by special permission, on a case-by-case basis, when a discharger can demonstrate that a larger heat dissipation area meets the tests for a waiver under Section 316 of the Federal Clean Water Act."

SWQS provide that for bays, "heat dissipation areas" will be developed on a case by case basis at N.J.A.C. 7:9B-1.14 (c)(11)(ii)(2).

Section 316(a) of the Federal Clean Water Act regulates the thermal component of surface water discharges. Specifically, Section 316(a) authorizes variances from thermal surface water quality standards where it is shown that the alternative limit proposed will "assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife" in the receiving water.

2. Section 316(a) Determination in 1994 NJPDES/DSW Permit

a. Contractor Review

In 1987, the Department engaged Versar, Inc. as an independent contractor to assist in reviewing the permittee's Section 316(a) and (b) Demonstration. The Section 316 Demonstration was originally submitted in 1974 with supplements in 1978 and July 1986. The 1986 supplement included an analysis of entrainment and impingement studies conducted from November 1984 through December 1985.

Versar was tasked to review and evaluate the Section 316 documents, to evaluate the impact of the facility on the aquatic environment, and to recommend the limitations which should be placed on the intakes and discharges so as to meet the intent of Section 316 and other applicable State and Federal requirements. The Department released Versar's

1988 Advanced Final Report for comment in 1988. In reviewing the permittee's 1988 comments, the Department was made aware that Versar had not been aware of critical data collected by the permittee at that time, namely GPU Nuclear. Upon review of this additional information, Versar submitted a report entitled "Technical Review and Evaluation of Thermal Effects Studies and Cooling Water Intake Structure Demonstration of Impact for the Oyster Creek Nuclear Generating Station, Revised Final Report", dated May 1989 (1989 Versar Report).

As described in the 1989 Versar report, Versar reviewed the extent of the thermal plume from the Station based on dye plume mapping, thermal plume mapping, recirculation studies and hydrothermal modeling submitted by the permittee and other agencies. The 1989 Versar Report indicated that operation of the Station did not appear to produce unacceptable, substantial long-term population and ecosystem level impacts and such operation assures the protection and propagation of a balanced, indigenous population of fish, shellfish, and wildlife in and on the receiving waters. The 1989 Versar Report recommends, among other things, that the Department grant a thermal variance pursuant to Section 316(a) and that the Department require the permittee to conduct and submit Dilution Pump Optimization Studies. The goal of this study was to develop a decision framework to predictively evaluate the seasonal operation of the dilution pumps in order to minimize the potential for the Oyster Creek cooling system to affect the biota of Barnegat Bay. In other words, the goal of any study would be to predict a schedule for operation of the dilution pumps to ensure that pumps were operated to mitigate thermal effects, but yet minimize operations to minimize entrainment effects. A workplan for this study was completed and submitted in May 1995.

b. Section 316(a) Determination in this Renewal Permit

In the June 30, 1994 draft renewal permit, the Department made a determination that the existing thermal limitations and operating requirements met the 316(a) criteria based on the findings of the permittee's 1987 316(a) study. However, the existing permit requires a number of operating and monitoring conditions to ensure that thermal effects were minimized during critical periods. These conditions have been continued in this renewal permit and can be summarized and justified as follows:

- Planned Winter Shutdown Conditions – The permittee shall not schedule routine shutdowns during the months of December, January, February, and/or March to reduce the possibility of a fish-kill resulting from cold shock. The permittee shall also not schedule routine maintenance that may cause violation of thermal limitations or intake velocity limitations during the months of June, July, August, and/or September. The Department acknowledges that the NJPDES Regulations require the permittee to maintain its plant in good working order and efficient operation and, therefore, some maintenance may be required. This condition is included in Part IV of the permit.

  Basis and Background to Planned Winter Shutdown Condition - Many fish species initiate their autumn migration from temperate estuarine areas such as Barnegat Bay to southern areas or deeper oceanic waters in response to temperature cues. Fish commonly thermoregulate by seeking water having temperature closer to their thermal preference. As a consequence, during the autumn, winter, and spring, fish are attracted to areas such as the Oyster Creek Discharge Canal, which acts to confine heated water from condenser cooling. Upon winter shutdowns of the Station, the thermal discharge from condenser cooling ceases and the temperature of this area quickly reverts towards ambient.

  Provisions in the 1987 NJPDES permit regarding planned winter shutdowns of the Station required the permittee to avoid scheduling shutdowns during the months of December, January, February, and March. These provisions were, for the most part, based on a permit issued by USEPA. The restriction on planned winter shutdowns was included in the 1987 and 1994 NJPDES permits to lessen the probability of winter shutdown fish kills associated with cold shock. This condition has been retained once again in this renewal permit.

- Temperature Monitoring at Route 9 Bridge – The permittee is required to continuously monitor temperature at a point four feet below the surface of Oyster Creek at the Route 9 bridge. A maximum temperature action level of 97 °F (36.1 °C) shall be continued in this permit action. Upon exceedance of this action level, the permittee may be required to conduct and submit an Effluent Temperature Evaluation Study (ETES) as

detailed in Part IV of the permit. Temperature results from this location shall also determine when dilution pumps become operational. This condition is included in Part IV of the permit.

Basis and Background to Temperature Monitoring at Route 9 Bridge - In order to ensure that the temperature of the water at the point it enters Barnegat Bay remains approximately at the temperature that was used in the Section 316(a) determination, the Department is requiring the Station to continue to monitor water temperature at the Route 9 Bridge. If the temperature is monitored above 97°F, the Station is required to submit a written report to the Department stating the reason for such. If the temperature increase is due to (a) unusually high influent temperature, i.e., any influent temperature in excess of 85° F; (b) operation of the Dilution Pumps in accordance with Part IV; or (c) implementation of the alternate effluent limitations in accordance with a Maximum Emergency Generation event as defined in this permit, the Station is required to do no more. If the temperature increase is not attributable to any of the above, the Station is required to conduct an Effluent Temperature Evaluation Study ("ETES") as detailed in Part IV to identify the cause of the temperature increases and to implement measures to prevent the temperature increases from occurring again.

The Station's exceedance of the temperature monitoring action level of 97 degrees Fahrenheit is not a violation of the permit for which an enforcement action could be taken. The Station's failure to report an exceedance, to provide the Department with a written report providing reasons for the exceedance or to conduct the ETES in the time frames and manner established in the permit would, however, constitute violations of the permit for which enforcement action could be instituted.

- Maximum Emergency Generation – The permittee is permitted to increase its heat load, effluent temperature and delta T limitations for outfall DSN 001A during a Maximum Emergency Generation event as ordered by the PJM Interconnection Office of Information Dispatcher in accordance with Section 2 (Capacity Conditions) of the PJM Interconnection Emergency Operations Manual M-13, dated October 10, 1998 and any subsequent revisions thereto. Within 8 hours of the permittee being advised that Maximum Emergency Generation has been ordered, the permittee must notify the Department by telephone declaring that the Station has invoked the use of the alternate thermal limits of the permit. The Station must follow-up the telephone notification within five working days with a written report setting forth the following: the time and date of the telephone notification to the Department, the time and date the Station actually invoked relief under this permit condition, and the time and date it terminated such relief. A similar condition was contained in the 1994 permit issued to this facility; however, the term Emergency Need for Power has been replaced with Maximum Emergency Generation to reflect revisions to the PJM Interconnection Emergency Operations Manual.

In sum, the Department has determined it appropriate to continue those thermal limitations and operating requirements in this permit action. In addition to the above, this continued variance is based on the fact that the facility's operations have not changed appreciably since the time that the existing permit was issued and based on the fact that cooling water intake flow rates have remained relatively constant. Therefore, the Department is hereby granting a thermal variance in accordance with Section 316(a) of the Clean Water Act and the anti-backsliding provisions as cited in N.J.A.C 7:14A-13.19.

B. Section 316(b) Determination

1. Regulatory Background - Clean Water Act Section 316(b)

Section 316(b) "require[s] that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." The majority of environmental impacts associated with intake structures are caused by water withdrawals that ultimately result in aquatic organism losses. In that regard, cooling water intakes can have two types of effects. The first effect, referred to as *entrainment*, occurs when organisms pass through the facility's intake screens and the cooling system itself. The second effect, referred to as *impingement*, occurs when organisms are caught on the intake screens or associated trash racks.

Impingement takes place when organisms are trapped against intake screens by the force of the water passing through the cooling water intake structure. Impingement can result in starvation and exhaustion (organisms are trapped against

an intake screen or other barrier at the entrance to the cooling water intake structure), asphyxiation (organisms are pressed against an intake screen or other barrier at the entrance to the cooling water intake structure by velocity forces that prevent proper gill movement, or organisms are removed from the water for prolonged periods of time), and descaling (fish lose scales when removed from an intake screen by a wash system) as well as other physical harms.

Entrainment occurs when organisms are drawn through the cooling water intake structure into the cooling system. Organisms that become entrained are normally relatively small benthic, planktonic,and nektonic organisms, including early life stages of fish and shellfish. Many of these small organisms serve as prey for larger organisms that are found higher on the food chain. As entrained organisms pass through a plant's cooling system they are subject to mechanical, thermal, and/or toxic stress. Sources of such stress include physical impacts in the pumps and condenser tubing, pressure changes caused by diversion of the cooling water into the plant or by the hydraulic effects of the condensers, shear stress, thermal shock in the condenser and discharge canal, and chemical toxemia induced by antifouling agents such as chlorine produced oxidants.

EPA issued final regulations for Phase II facilities effective September 7, 2004. Phase II existing facilities, as defined by EPA in their Phase II regulations, are facilities that commenced construction before January 17, 2002 that have design flows over 50 MGD. This facility is eligible under Phase II of the regulations. The term "cooling water intake structure" is defined as the total physical structure and any associated constructed waterways used to withdraw cooling water from waters of the U.S. The cooling water intake structure extends from the point at which water is withdrawn from the surface water source up to, and including, the intake pumps.

2. Section 316(b) Determination in 1994 NJPDES/DSW Permit

a. Summary of Impingement/Entrainment Losses

As described previously under Section 316(a), the Department hired a contractor to review available Section 316 documents. Some of these data are still appropriate for consideration as they give a measure of the impingement and entrainment impacts as well as the Representative Important Species (RIS) used to evaluate the effects. The Section 316 demonstration relied on the following Representative Important Species (RIS) to assess intake impacts at the Station:

Winter Flounder	Bay Anchovy
Sand Shrimp	Hard Clam
Blue Crab	Eelgrass
Opossum shrimp	Atlantic Ridley turtle
Teredo spp.	Bankia gouldi

The RIS impact assessment approach is based on the concept that it is not feasible or cost effective to measure power plant effects on all species inhabiting aquatic environments. In most aquatic ecosystems it is, however, generally possible to identify biota which because of their abundance, distribution, ecological, or economic importance are essential to and/or representative of the maintenance of balanced, indigenous populations of shellfish, fish, and wildlife. These RIS species are used to focus impact assessment efforts, making the assumption that if populations of these surrogate species are protected, then other populations, and the ecosystem as a whole, will also be protected. Because many RIS are near the top of the estuarine food webs or are key links in food webs, changes in the abundance or distribution are indicators of system wide alterations. In order for RIS to be reliable indicators of impact, they should include biota that are sensitive to power plant impacts as well as biota that are representative of all major trophic levels.

As noted in the 1989 Versar report, the following three models were used to evaluate impingement and entrainment losses in the context of population size or biological productivity to understand the potential consequences of losses to Barnegat Bay RIS populations. The models used were:

1. Equivalent Adult Model (EAM) which examines changes in survivorship to sexual maturity or recruitment into a fishery.

2. Production Foregone Model (PFM) which examines fractional reductions in annual net population (weight) production.
3. Spawning/Nursery Area of Consequence Model (SNAC) which estimates fractional (or percent) reduction in RIS populations which are directly attributable to the Oyster Creek facility.

The EAM evaluated the number of RIS which would have survived to adulthood if impingement and entrainment losses had not occurred. The EAM was used since many of the aquatic organisms lost are at early life stages or are juveniles. Results of the EAM in the 1989 Versar report are presented below:

Species	Estimated Adult Loss (Thousands per year)
Bay Anchovy	137,000
Hard Clam	59
Blue Crab	10.4
Winter Flounder	56.4
Opossum shrimp	1,720,000
Sand shrimp	164,000

Versar noted that the projected equivalent adult losses for Bay anchovy, Opossum shrimp, and Sand shrimp are high but the production foregone model provided a better means to evaluate the significance of these losses to ecological functions in the Barnegat Bay. Versar also noted that these calculated equivalent adult losses are highly variable due to large uncertainties associated with entrainment losses.

The PFM estimated percentage declines in annual net production due to entrainment and impingement for those RIS which serve a forage function. Results of Versar's PFM are presented below:

RIS species	**Percent loss**	**Forage Production Lost**
Bay anchovy	12.4%	(354,000 lbs.)
Opossum shrimp	8.7 %	(67,000 lbs)
Sand shrimp	16.5%	(1,650,000 lbs)

The SNAC model estimated percentage declines in populations due to entrainment and impingement at the Oyster Creek facility. Results of Versar's SNAC model in the 1989 Versar Report are presented below:

RIS species	**Percent of Population Decline**
Winter Flounder	2.1%
Bay anchovy	3.2%
Hard clam	1.5%
Blue crab	0.4%
Sand shrimp	16.6%
Opossum shrimp	2.0%

As summarized above, the 1989 Versar report provided information regarding losses to RIS and also provided loss information in the context of populations. Loss data is helpful in assessing what technologies may be available to reduce losses. However, the Department maintains that it is unnecessary to have to prove that an impact to a population must be demonstrated in order to trigger Section 316(b). This rationale is consistent with the Phase II regulations which specify compliance alternatives, including national performance standards, and do not define adverse environmental impact. In other words, a past determination that focuses on any effects to a balanced indigenous population is not directly relevant to attaining the national performance standards defined in the Phase II rule. Available data shows that impingement and entrainment losses are documented and must be minimized consistent with the goal of the Phase II Section 316(b) regulations.

b. Alternative Intake Protection Technologies

As described in the 1994 NJPDES permit, the Department evaluated available information on various technologies, including their technical feasibility, biological effectiveness, and associated costs. The alternative technologies identified by the Department's contractor, Versar, to have the greatest potential for application to reduce impingement and entrainment at the Station were:

1. Replacing the existing 3/8" mesh traveling screens with fine mesh screen panels.
2. Traveling screens with conventional 3/8" mesh or fine mesh retrofitted in front of the dilution pumps and/or fine-mesh centerflow screens retrofitted in front of the dilution pump.
3. Replacement of intakes with fine-mesh wedgewire screens.
4. Closed cycle cooling (cooling towers).
5. Optimization of dilution pump operations.

As discussed in the 1989 Versar report, the first two alternatives would increase impingement losses while reducing entrainment. The net ecological benefit of these retrofits would depend on the degree to which the reduction in entrainment losses exceeds the gain in impingement losses. Versar looked primarily at the first three physical barrier alternatives as they could be applied without complete replacement of the intake structure so as to avoid the high cost of an entirely new intake structure. Versar was concerned with limited data on the engineering feasibility of some of these alternatives and was not able to recommend that the cost of these technologies could be appropriate in view of the limited benefits of these technologies. In sum, Versar found that none of the screening options reduces losses at the facility by even 50%.

Versar dismissed the wedgewire screen alternative because its costs far exceeded its benefits. Biofouling and detrital clogging would also be a concern in the application of wedgewire screens at the Station.

Versar also considered the alternative of recirculating cooling towers which are a demonstrated, effective technology for reducing entrainment and impingement, as well as thermal discharge impacts. Cooling towers are the most expensive alternative but would reduce water withdrawal by more then 95 percent and provide the highest degree of protection of any single currently available technology as a proportionate reduction in impact would result from the withdrawal (flow) reduction. Cooling towers are expected to be more costly then the physical barrier alternatives and Versar did not recommend cooling towers to be designated the best technology available due to concerns about economic cost. Additionally, Versar concluded that there are ecological costs associated with cooling towers. Natural draft cooling towers are typically several hundred feet high and add considerable visual impact. Mechanical draft towers may be lesser in size thereby imposing less visual impact but would impose noise from tower fans as well as the potential for local salt drift, fogging and icing.

Versar also looked into optimization of dilution pump operations as an alternative for reducing total plant impingement-entrainment losses. Optimization studies would compare the benefits of an altered thermal mortality rate (from the cooling provided by dilution pump flows) with the environmental cost of exposure by entrainment of a greater number of organisms due to dilution pump flows. Versar found that the Section 316 Demonstration did not contain sufficient information to optimize dilution pump operations. Versar found that November through February (potential cold shock) and July and August (potential heat shock) are periods of high risk of increasing total mortality associated with the facility.

In sum, based on the above review of available technologies, the Department determined that the existing cooling water intake structure, in conjunction with the pursuit of Dilution Pump Optimization Studies, was designated Best Technology Available under Section 316(b) in its 1994 permit based upon available Section 316(b) guidance at that time.

3. Implementation of Section 316(b) Regulations

a. Compliance Alternatives

While historical data and information relied upon in the Department's previous Section 316(b) determination is useful, implementation of Section 316(b) in the current permit will be unique in that this is the Station's first permit action in which the newly effective Section 316(b) regulations will be implemented. The existing and proposed renewal permits contain a limit on intake velocity which aids in minimizing impingement and entrainment losses. The Department also recognizes that the facility has impingement controls of the circulating water system intake, namely Ristroph traveling screens and a fish return system. The Department has required Ristroph traveling screens at a number of other Phase II facilities and finds that they are a proven and effective technology for minimizing impingement effects for some species but have no effect on reducing entrainment. In addition, the Oyster Creek fish return system is designed with gentle slides and collection pools to lessen the impact on impinged fish. As stated previously the permittee contends that the design of the dilution system pumps allow for some impingement and entrainment survivability, however there are no other impingement or entrainment controls at the dilution pumps, which at times exceed the flow volume of the intake. Pursuant to the new Phase II regulations, entrainment survivability is only allowable if it is the subject of a study approved by the Director pursuant to 40 CFR 125.95(b)(6)(B). Therefore, unless closed-cycle cooling is chosen, the permittee must address measures to reduce impingement and entrainment at the dilution pumps as part of its demonstration for compliance under the regulations. The Department recognizes that controls at the dilution pumps were considered costly as part of its BTA determination in the 1995 permit; however, given the fact that these pumps are regulated purusant to 40 CFR 125.93, impingement and entrainment effects must be minimized at this location.

Given the available impingement and entrainment data, the Department is concerned about both impingement and entrainment losses, but is particularly concerned about the entrainment losses. As stated above, this was also raised as a concern in the 1995 Section 316(b) determination. Species of particular concern include hard clam, blue crab, bay anchovy and sand shrimp. Nonetheless, the Department understands that there are limited design and construction technologies available to reduce entrainment at this time. Specifically, the Department recognizes that closed cycle cooling is the only cooling water intake structure technology available to the facility to reduce entrainment. Closed cycle cooling serves to significantly limit the amount of intake flow and thereby reduces both impingement and entrainment. Restoration can be used as a means to offset entrainment; however, there are also some benefits to larger life stages that are typically susceptible to impingement.

The regulations specify compliance alternatives at 40 CFR Part 125.94 and the required submission of a Comprehensive Demonstration Study (CDS) at 40 CFR 125.95. Based upon a review of site-specific factors at the facility, past Department policies and practices in implementing Section 316(b), and given the fact that the facility withdraws water from a tidal river or estuary, the Department has determined that_the following compliance alternatives are available as specified at 40 CFR 125.94(a) to demonstrate compliance with Section 316(b):

1) **Alternative 1:** Reduce intake capacity to a level commensurate with the use of a closed-cycle, recirculating cooling system. This is the Department's preferred alternative. If Alternative 1 is chosen, the permittee would not be required to submit the CDS.

2) **Alternative 2:** 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:

Impingement Mortality Performance Standard – Reduce impingement mortality for all life stages of fish and shellfish by 80 to 95 percent from the calculation baseline[1].

Entrainment Performance Standard – Reduce entrainment for all life stages of fish and shellfish by 60 to 90 percent from the calculation baseline[1].

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.

[1] 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.

b. Basis and Background Regarding Compliance Alternatives

The Department recognizes that the Section 316(b) regulation allows for the pursuit of the studies outlined at 40 CFR 125.95 prior to selecting a compliance alternative. Consistent with this regulation, the Department is requiring the submission of a CDS via this permit. The Department is already in receipt of a Proposal for Information Collection (PIC) dated June 29, 2005 and is in the process of review and comment. However, the Department also recognizes that some relevant Section 316(b) data and information is available as part of the Administrative Record. The Department has evaluated these studies and has determined that at this time there are limited technologies available to address entrainment with the exception of closed-cycle cooling. The Department also recognizes that the permittee could develop a restoration plan as part of the CDS where one of the requirements for the Restoration Plan, as specified at 40 CFR Part 125.95(b)5(iii), would be the "Quantification of the ecological benefits of the proposed restoration measures..." In other words, one of the outputs of a Restoration Plan would be an estimated amount of acreage necessary to offset any remaining impingement and entrainment losses not addressed via technological measures to meet the national performance standards.

It is the Department's practice and policy to set forth a Best Technology Available (BTA) determination in its NJPDES permits with respect to Section 316(b). Consistent with past practice, the Department has set forth a BTA determination in this permit based on the site-specific factors at Oyster Creek and available information. Therefore, the Department has determined that BTA for this facility is as follows.

- Option 1 - the implementation of closed-cycle cooling is best technology available.

- Option 2 - BTA consists of the permittee's existing once-through cooling system coupled with a limit on the intake velocity, pursuit of the studies required under the Section 316(b) Phase II Regulations, and the initial restoration requirement.

Acknowledging the limited efficacy of best available technologies, the Department has determined that the initial restoration requirement is an appropriate more stringent condition in accordance with Best Professional Judgement. The Department reserves the right to reconsider BTA in any future decision based on the data and results of the CDS where any such decision would be subject to public comment and notice procedures at N.J.A.C. 7:14A-16.4.

The Department also recognizes that the Phase II Section 316(b) regulation allows for additional time in devising a restoration plan which could include an amount of acreage necessary. The Department has evaluated the approximation of the fish losses based on the 1987 316 study and has estimated the wetlands restoration acreage required to adequately minimize the effects of the Station's losses. The Department utilized a food chain model to estimate the production of fish biomass for the species at issue. Primary productivity per acre of wetland per year and food chain transfer conversion factors were derived from published, peer-reviewed scientific literature and were employed in this calculation. Conservative assumptions were also incorporated in this calculation. Given the fish losses reported in the study, a preliminary calculation as to the amount of restoration acreage in the Barnegat Bay watershed that would be necessary to offset fish losses at Oyster Creek would equal 3500 acres. The Department is only requiring 350 acres at this time and is not requiring implementation of the 3500 acre value. This is a means to allow the permittee to implement a portion of restoration but yet allow time to evaluate whether the 3500 acre estimate is appropriate as part of any Restoration Plan. The Department would be willing to evaluate any alternate estimate developed by the permittee in its CDS.

Restoration is allowable under the Section 316(b) regulations as a means to attain compliance with the National Performance Standards. While the Department recognizes that restoration is not an intake protection technology, the Department concurs that restoration is a viable alternative to minimize the residual effects of cooling water intake structures after the implementation of BTA. Estuarine wetlands are valuable natural resources. Wetland systems provide foraging and refuge habitat, serve as nursery areas for early life stages and juveniles, and provide direct food resources through the production of detrital matter. For these reasons, increased wetlands in the Barnegat Bay watershed will contribute directly to the increased abundance of these species. Because wetlands in the Barnegat Bay area support production of the species at issue, wetlands restoration and enhancement will minimize the effects of

Oyster Creek related losses by increasing productivity of these species. Wetlands restoration and enhancement is particularly valuable towards offsetting entrainment losses given the fact that eggs, larvae and young of year species typically utilize estuarine environments. Wetlands restoration and enhancement also benefits other aquatic and terrestial species dependent on the productivity derived from the wetlands.

c. Methods to Implement Restoration

EPA's National Estuary Program (NEP) was established by Congress in 1987 to improve the quality of estuaries of national importance. In July, 1995, EPA recognized the Barnegat Bay estuary as an estuary of national significance threatened by pollution, development and overuse and was accepted into the NEP. As per the NEP, a Final Comprehensive Conservation and Management Plan was issued in May 2002 by EPA Region II, NJDEP, and interested Ocean County stakeholders. This plan details possible sources of restoration including but not limited to:

- Protect and improve vegetated buffer zones adjacent to coastal wetlands and freshwater tributaries to maintain continuous riparian corridors for habitat protection and low-impact recreational pursuits.

- Control erosion in threatened shoreline areas.

- Manage tidal wetlands to preserve unditched wetlands and to rehabilitate wetlands that have been ditched or otherwise altered (e.g., through Open Marsh Water Management).

- Land acquisition and restoration efforts of threatened sensitive natural areas are outlined in The Trust for Public Land's report entitled The Century Plan. In 1995, TPL published "The Century Plan: A Study of One Hundred Conservation Sites in the Barnegat Bay Watershed," a comprehensive study identifying 103 high-priority conservation and public access sites in the Barnegat Bay. A map showing the 103 sites is included at the end of this Fact Sheet.

The permittee could also implement restoration activities on its own lands. Specifically, a project for the permittee's property is discussed and cited in the United States Army Corps of Engineer's Report entitled "Draft Conceptual Design Alternatives and Associated Tasks for Environmental Restoration Feasibility Study" dated December 6, 2001for the Oyster Creek property.

4. Section 316(b) Requirements

The Department is requiring compliance with the newly effective Section 316(b) regulations in a two fold approach. First, it has included requirements in this permit tailored to the site-specific factors at Oyster Creek. Secondly, because there are already Section 316(b) studies and data available, the Department has specified two compliance alternatives and a schedule for implementing such. The Department's implementation of EPA Phase II regulations set forth in this permit is a more stringent site-specific application based on the Department's past practices, policies and best professional judgment. Such an application is authorized by Section 125.94(e) of the Phase II rule. See, EPA Office of Water letter dated June 29, 2004. A complete summary of all the Section 316(b) requirements are as follows:

a. Compliance Alternatives

Alternative 1: Implementation of Closed-Cycle Cooling

If Alternative 1 is chosen, the permittee must do the following:

- By **September 7, 2005**, the permittee must notify the Department that this is the preferred alternative in its Proposal for Information Collection or in an addendum to such. The Department acknowledges receipt of a PIC dated June 29, 2005.

- Obtain all federal, state, and local construction permits and contract a bid to construct by **EDP + 48 months**.

- Commence construction by **EDP + 59 months**.

- Submission of a CDS is not required under Alternative 1.

Alternative 2: Work Towards Attainment of National Performance Standards via Design and Construction Technologies, Operational Measures and/or Restoration Measures

The Section 316(b) regulations require submission of a CDS and a PIC. The PIC is essentially a workplan that precedes the CDS. As noted previously, existing impingement and entrainment data is available that documents losses at the facility, particularly to hard clam, sand shrimp and blue crab. Given that the impingement controls currently at the facility are not comparable to the impingement reductions of 80 to 95% as specified in the Section 316(b) regulations as national impingement performance standards, the Department has imposed permit requirements for Alternative 2 in addition to the CDS requirements. These Section 316(b) requirements are being imposed in accordance with Best Professional Judgement and are consistent with the intent and direction of the final regulation. These additional requirements are necessary in order to ensure that the minimization of impingement and entrainment effects are realized as soon as possible. Therefore, the Section 316(b) requirements for Alternative 2 are as follows:

1) Proposal for Information Collection – due **September 7, 2005**. The Department acknowledges receipt of a PIC dated June 29, 2005.

- Notify the Department that **Alternative 2** is the preferred alternative.

- Refer to 40 CFR 125.95(b)1 for additional requirements. The Department acknowledges receipt of a PIC dated June 29, 2005.

2) Impingement Mortality and/or Entrainment Characterization Study – due as part of the CDS by **January 7, 2008**

- Refer to 40 CFR 125.95(b)3 for requirements. Please note that since the permittee's Section 316(b) studies are over ten years old, data from these previous studies may be used for comparison purposes but additional data collection is also required.

3) Technology and Compliance Assessment Information for Impingement

a) Design and Construction Technology Plan - Refer to 40 CFR 125.95(b)4. Except for the requirements listed below, the Design and Construction Technology Plan is due by **January 7, 2008**. Additionally, the following site-specific requirements apply:

- Existing Impingement Control Technologies and Enhancements to Minimize Impingement Mortality – The permittee shall detail the technologies and operational measures that are already in place to reduce impingement at the circulating water intake structure and the dilution water intake structure. Information shall be submitted to demonstrate the efficacy of those technologies for RIS to provide a measure of compliance with the impingement national performance standards. This study shall also include an analysis of the location of the fish return system (that currently enters near the dilution pump discharge) and propose alternative fish return points to minimize stress to the aquatic organisms that are returned to the discharge canal via the fish return sluice. This study shall be submitted by **January 1, 2007**.

- Alternate Impingement Controls – The permittee shall address impingement controls at the dilution pumps. In addition, the permittee shall analyze alternate intake protection technologies at the circulating water intake structure to further minimize impingement effects. This study shall be submitted by **January 1, 2007**.

b) Technology Installation Plan – Refer to 40 CFR 125.95(b)3. Except for the requirements listed below, the Technology Installation Plan is due by **January 7, 2008**. Additionally, the following site-specific requirements apply:

- Installation Schedule – Based upon review of the above design and construction technology studies, if the Department concurs that any available technology assessed above in the design and construction technology plan is appropriate in minimizing impingement effects, the permittee shall propose and submit an installation schedule and commence installation by **January 7, 2008.**

4) Technology and Compliance Assessment Information for Entrainment – At this time the installation of closed-cycle cooling and restoration appear to be the only measures that can further minimize or offset entrainment to the levels specified in the national performance standards given the site-specifics of Oyster Creek. If the permittee chooses not to install closed-cycle cooling, the permittee shall review available entrainment technologies with particular attention to any new, improved or developing technologies. Any report shall be submitted by **January 7, 2008**.

5) Restoration Plan - As part of the CDS, the permittee shall prepare a Restoration Plan in accordance with the requirements specified at 40 CFR 125.95(b)5. The Restoration Plan shall take into account the impingement and entrainment losses at the plant and determine the number of acres of wetlands restoration, land preservation or other methods that would offset impingement and entrainment losses (in combination with the existing technologies) to attain the impingement and entrainment national performance standards. This value shall be compared to the Department's preliminary estimate of 3500 acres. Except for the requirements listed below, the Restoration Plan is due by **January 7, 2008**. Additionally, the following site-specific requirements apply:

a) Initial Restoration Requirement – Initiate a wetlands restoration and enhancement program of a minimum of 350 acres within the Barnegat Bay estuary to ensure that benefits of wetland restoration are realized as soon as possible to offset the entrainment losses at the facility. The amount of 350 acres is 10% of the estimated restoration requirement of 3500 acres. The following applies to the Initial Restoration Requirement:

- Identification of Initial Restoration Sites – The permittee shall identify the sites and restoration methods to be employed for the Department's review. A description of the identified sites shall be submitted to the Department by **EDP + 12 months.** Restoration and/or preservation of uplands adjacent or contiguous to Barnegat Bay estuary tidal wetlands (upland buffer) can also count towards the acreage requirements but at a 3:1 basis (three acres of upland buffer equals one acre of Barnegat Bay estuary tidal wetlands). As stated previously, the permittee may elect to conduct restoration on its own lands.

- Peer Review of Initial Restoration Sites – Peer review of the proposed restoration methods for the identified sites is required. The permittee shall designate a minimum of four peer reviewers where their selection shall be approved by the Department. The permittee shall designate at least one member from within the Department. Peer reviewers must have appropriate qualifications in the fields of geology, engineering and/or biology. At least one peer reviewer shall be a member of the Barnegat Bay National Estuary Program. The permittee shall select a peer review group and seek peer approval by **EDP + 12 months**.

- Secure Control of Land – The permittee shall secure control of land selected for the initial restoration requirement and initiate restoration methods by **EDP + 24 months**.

5) Verification Monitoring Plan

- Existing Impingement Controls – a Verification Monitoring Plan, in accordance with 40 CFR 125.95(b)(7), shall be submitted with the CDS by January 7, 2008.

- Future Impingement and/or Entrainment Controls – a schedule for a Verification Monitoring Plan for future impingement and/or entrainment controls shall be submitted with the CDS.

9 Type and Quantity of the Wastes or Pollutants:

The Permit Summary Table near the end of this fact sheet contains a summary of the quantity and quality of pollutants treated and discharged from the facility and the proposed effluent limitations. Effluent data was obtained from the facility's Monitoring Report Forms for the time period specified in the table.

10 Summary of Chemical-Specific Permit Conditions:

The existing and proposed effluent limitations and other pertinent information regarding the draft permit are described below:

A. Basis for Effluent Limitations and Permit Conditions - General:

The effluent limitations and permit conditions in this permit have been developed to ensure compliance with the following:

1. NJPDES Regulations (N.J.A.C. 7:14A),
2. New Jersey Surface Water Quality Standards (N.J.A.C. 7:9B),
3. 1998 "Identification and Setting of Priorities for Section 303(d) Water Quality Limited Waters in New Jersey" report,
4. Wastewater Discharge Requirements (N.J.A.C. 7:9-5.1 et seq.),
5. Existing permit limitations in accordance with N.J.A.C. 7:14A-13.19 and 40 CFR 122.44 (antibacksliding requirements),
6. Permit limitations in accordance with N.J.A.C. 7:9B-1.5(d) (antidegradation requirements),
7. Statewide Water Quality Management Planning Rules (N.J.A.C. 7:15),
8. Technology Based Treatment Requirements or Effluent Limitation Guidelines Requirements (N.J.A.C. 7:14A-13.2 to 13.4),
9. 40 CFR Part 423
10. 40 CFR Part 125, Subpart H

Technology based limitations are authorized by Section 301 of the Clean Water Act, 40 CFR 122, N.J.S.A. 58:10A-4, and N.J.A.C. 7:14A-13.2(a)1.ii., 13.3(b), and 13.4. In general, effluent limitations are based on Effluent Limitation Guidelines (ELGs), developed by the United States Environmental Protection Agency (USEPA), or on case-by-case limitations developed through a Best Professional Judgment (BPJ) analysis in cases where ELGs are not available or appropriate. ELGs are minimum technology based requirements applicable on a nation-wide basis and are published in 40 CFR Subchapter N. ELGs consider the category of industry that produce common pollutants taking into account the specific factors unique to a particular type of industry (manufacturing process, type and quantity of pollutants generated, types of treatment facilities available to treat the pollutants, etc.). In cases where ELGs are applicable for surface water dischargers, ELG loading limitations are calculated using the specified concentration value and the production information provided by the permittee. BPJ determinations are authorized by Section 402 (a)(1) of the Clean Water Act.

Effluent Limitation Guidelines (ELGs) are applicable to this facility in accordance with 40 CFR 423, the Steam Electric Power Generating Point Source Category. Where applicable, these guidelines were used to develop effluent limitations for the discharges from this facility unless a more stringent federal, state, or local effluent limitation was applicable.

In accordance with N.J.A.C. 7:14A-13.5, Water Quality Based Effluent Limitations (WQBELs) are imposed when it has been determined that the discharge of a pollutant causes an excursion of criteria specified in the New Jersey Surface Water Quality Standards (SWQS), N.J.A.C. 7:9B-1.1 et seq., and the Federal Water Quality Standards, 40

CFR Part 131. WQBELs are authorized by Section 301 of the Clean Water Act, 40 CFR 122, N.J.S.A. 58:10A-4, and N.J.A.C. 7:14A-13.2 and 13.3. The policies used to develop WQBELs are contained in the State and Federal Standards. Specific procedures, methodologies, and equations are contained in the current USEPA "Technical Support Document for Water Quality-based Toxics Control" (TSD) (EPA- 505/2-90-001) and are referenced in N.J.A.C. 7:14A-13.5 and 13.6.

Expression of all effluent limitations are in accordance with N.J.A.C. 7:14A-13.14 and 13.15.

Whole effluent toxicity limitations are expressed as a minimum as a percent.

B. Basis and Derivation for Effluent Limitations and Monitoring Requirements- Specific:

DSN 001A: Non-Contact Cooling Water (approximately 592 MGD)

1. Flow: This permit does not include a numerical limitation for flow. Monitoring conditions are applied pursuant to N.J.A.C. 7:14A-13.13.

2. pH: The effluent limitations are based on the anti-backsliding provisions as cited in N.J.A.C 7:14A-13.19. A condition for monitoring intake pH has been included since a narrative condition regarding pH compliance has been included in Part IV A.1.h.

3. Effluent Temperature, Intake Temperature, Temperature Difference Between Intake and Discharge, Net Rate of Addition of Heat: The effluent limitations and/or monitoring requirements are based on the findings of the permittee's 1987 316(a) study and the anti-backsliding provisions as cited in N.J.A.C 7:14A-13.19. Additional information regarding temperature and heat limitations is included in the Section 316(a) determination discussed previously in this Fact Sheet.

   Consistent with the existing permit, the Department has continued effluent limitations for effluent temperature, temperature difference between intake and discharge, and net rate of addition of heat under two scenarios that are identified in this permit as Option 1 and Option 2 limits. Option 1 limits are applicable when four circulating water pumps are operating for condenser cooling. Option 2 limits shall be applicable during periods of condenser backwash, intake component maintenance or during a Maximum Emergency Generating Event. An explanation of these conditions is also specified as items G.1.g. and G.1.i. of Part IV.

4. Intake Velocity: The daily maximum limitation for intake velocity is based on the anti-backsliding provisions as cited in N.J.A.C 7:14A-13.19. This limitation was imposed in the existing permit to reduce impingement and entrainment at the cooling water intake. Additional information regarding intake velocity is included in the Section 316(b) determination discussed previously in this Fact Sheet. Upon review of any future 316(b) study as outlined previously, the Department may modify this limit. The intake velocity limit is also indicated as item G.2.a. of Part IV.

5. Chlorine Produced Oxidants (CPO): In accordance with the Surface Water Quality Standards N.J.A.C. 7:9B-1 et seq. Total Residual Chlorine (TRC) is now referred to as CPO. The term CPO is simply a more appropriate name for the compounds which the TRC test measures. The TRC test measures not only residual chlorine, but the sum of free and combined chlorine and bromine as well.

   The daily maximum limitation is based on 40 CFR 423.13(b)(1) and the anti-backsliding provisions as cited in N.J.A.C 7:14A-13.19. A narrative condition has been included in Part IV to ensure that chlorination only occurs for two hours per day consistent with 40 CFR Part 423. An additional CPO limit on a concentration basis applies to the turbine building closed cooling water heat exchanger. Data for this wastestream shall be tracked on monitoring report forms.

6. Whole Effluent Toxicity (WET): Section 101(a) of the Clean Water Act (CWA) establishes a national policy of restoring and maintaining the chemical, physical and biological integrity of the Nation's waters. In addition,

section 101(a)(3) of the CWA and the State's Surface Water Quality Standards (SWQS) at N.J.A.C. 7:9B-1.5(a)3 state that the discharge of toxic pollutants in toxic amounts is prohibited. Further, 40 CFR 122.44(d) and N.J.A.C. 7:14A-13.6(a) require that where the Department determines using site-specific WET data that a discharge causes, shows a reasonable potential to cause, or contributes to an excursion above the SWQS, the permitting authority must establish effluent limits for WET.

Acute WET sampling was imposed in the existing permit at a quarterly monitoring frequency. The Department issued a modification on November 26, 1996 that reduced the monitoring frequency to annual. Since January 1995, the permittee has consistently reported an acute result of LC50>100% for this discharge. Therefore, as the permittee has consistently shown no acute toxicity in their discharge, the Department proposes to reduce acute toxicity monitoring to once per permit cycle in accordance with N.J.A.C. 7:14A-14.1(b).

The test species method to be used for acute testing shall be the *Mysidopsis bahia* 96 hour definitive test. Such selection is based on the saline characteristics of the receiving stream, the existing permit, N.J.A.C. 7:9B-1.5 and N.J.A.C. 7:18, the Regulations Governing the Certification of Laboratories and Environmental Measurements (N.J.A.C. 7:18).

DSN 002A - Non-Contact Cooling Water (3.5 MGD)

1. Flow: This permit does not include a numerical limitation for flow. Monitoring conditions are applied pursuant to N.J.A.C. 7:14A-13.13.

2. pH: The effluent limitations are based on the anti-backsliding provisions as cited in N.J.A.C 7:14A-13.19. . A condition for monitoring intake pH has been included since a narrative condition regarding pH compliance has been included in Part IV A.1.h.

3. Effluent Temperature, Intake Temperature, Temperature Difference Between Intake and Discharge, Net Rate of Addition of Heat: The effluent limitations are based on the findings of the permittee's 1987 316(a) study and the anti-backsliding provisions as cited in N.J.A.C 7:14A-13.19.

4. Chlorine Produced Oxidants (CPO):

   In accordance with the Surface Water Quality Standards N.J.A.C. 7:9B-1 et seq. Total Residual Chlorine (TRC) is now referred to as CPO. The daily maximum limitation is based on 40 CFR 423.13(b)(1) and the anti-backsliding provisions as cited in N.J.A.C 7:14A-13.19.

5. Whole Effluent Toxicity (WET):

   Section 101(a) of the Clean Water Act (CWA) establishes a national policy of restoring and maintaining the chemical, physical and biological integrity of the Nation's waters. In addition, section 101(a)(3) of the CWA and the State's Surface Water Quality Standards (SWQS) at N.J.A.C. 7:9B-1.5(a)3 state that the discharge of toxic pollutants in toxic amounts is prohibited. Further, 40 CFR 122.44(d) and N.J.A.C. 7:14A-13.6(a) require that where the Department determines using site-specific WET data that a discharge causes, shows a reasonable potential to cause, or contributes to an excursion above the SWQS, the permitting authority must establish effluent limits for WET.

   Acute WET sampling was imposed in the existing permit at a quarterly monitoring frequency. The Department issued a modification on November 26, 1996 that reduced the monitoring frequency to annual. Since January 1995, the permittee has consistently reported an acute result of LC50>100% for this discharge. Therefore, as the permittee has consistently shown no acute toxicity in their discharge, the Department proposes to reduce acute toxicity monitoring to once per permit cycle in accordance with N.J.A.C. 7:14A-14.1(b).

The test species method to be used for acute testing shall be the *Mysidopsis bahia* 96 hour definitive test. Such selection is based on the saline characteristics of the receiving stream, the existing permit, N.J.A.C. 7:9B-1.5 and N.J.A.C. 7:18, the Regulations Governing the Certification of Laboratories and Environmental Measurements (N.J.A.C. 7:18).

DSN 004A - Non-Contact Cooling Water, Stormwater, Floor Drains (0.06 MGD)

1. Flow: This permit does not include a numerical limitation for flow. Monitoring conditions are applied pursuant to N.J.A.C. 7:14A-13.13. Consistent with the existing permit, the permittee is required to monitor and report net flow and heat exchanger flow where net flow shall be used for the purposes of calculating loading values.

2. Total Suspended Solids (TSS), Net: The concentration limitations are based on 40 CFR 423.12(b)(3) and the anti-backsliding provisions as cited in N.J.A.C 7:14A-13.19. The loading limitations are based on the long-term average flow of 0.06 MGD. As the source water for this discharge is the receiving stream, the permittee was allowed under the previous permit to meet these limitations on a 'net' basis and shall be allowed under this renewal permit as well. Therefore, because net limits are applied, monitoring and reporting for intake and effluent TSS is also required as a monthly average and daily maximum.

3. pH: The effluent limitations are based on the anti-backsliding provisions as cited in N.J.A.C. 7:14A-13.19. . A condition for monitoring intake pH has been included since a narrative condition regarding pH compliance has been included in Part IV A.1.h.

4. Effluent Temperature: The effluent limitations are based on the anti-backsliding provisions as cited in N.J.A.C 7:14A-13.19.

5. Petroleum Hydrocarbons: The effluent limitations are based on N.J.A.C. 7:14A-12.8(c). The loading limitations are based on the long term average flow of 0.06 MGD. As the source water for this discharge is the receiving stream, the permittee was allowed under the previous permit to meet these limitations on a 'net' basis and shall be allowed under this renewal permit as well.

6. Total Organic Carbon: The effluent limitations are based on the anti-backsliding provisions as cited in N.J.A.C 7:14A-13.19. The loading limitations are based on the long term average flow of 0.06 MGD.

7. Chlorine Produced Oxidants (CPO):

   In accordance with the Surface Water Quality Standards N.J.A.C. 7:9B-1 et seq. Total Residual Chlorine (TRC) is now referred to as CPO. The daily maximum limitation is based on 40 CFR 423.13(b)(1) and the anti-backsliding provisions as cited in N.J.A.C 7:14A-13.19.

8. Whole Effluent Toxicity (WET):

   Section 101(a) of the Clean Water Act (CWA) establishes a national policy of restoring and maintaining the chemical, physical and biological integrity of the Nation's waters. In addition, section 101(a)(3) of the CWA and the State's Surface Water Quality Standards (SWQS) at N.J.A.C. 7:9B-1.5(a)3 state that the discharge of toxic pollutants in toxic amounts is prohibited. Further, 40 CFR 122.44(d) and N.J.A.C. 7:14A-13.6(a) require that where the Department determines using site-specific WET data that a discharge causes, shows a reasonable potential to cause, or contributes to an excursion above the SWQS, the permitting authority must establish effluent limits for WET.

   Acute WET sampling was imposed in the existing permit at a quarterly monitoring frequency. The Department issued a modification on November 26, 1996 that reduced the monitoring frequency to annual.

Since January 1995, the permittee has consistently reported an acute result of LC50>100% for this discharge. Therefore, as the permittee has consistently shown no acute toxicity in their discharge, the Department proposes to reduce acute toxicity monitoring to once per permit cycle in accordance with N.J.A.C. 7:14A-14.1(b).

The test species method to be used for acute testing shall be the *Mysidopsis bahia* 96 hour definitive test. Such selection is based on the saline characteristics of the receiving stream, the existing permit, N.J.A.C. 7:9B-1.5 and N.J.A.C. 7:18, the Regulations Governing the Certification of Laboratories and Environmental Measurements (N.J.A.C. 7:18).

DSN 005A – Dilution Water (732 MGD)

1. Flow: This permit does not include a numerical limitation for flow. Monitoring conditions are applied pursuant to N.J.A.C. 7:14A-13.13. Part IV contains dilution pump operation requirements that are in accordance with the existing permit.

DSN 007A – Miscellaneous Wastewater (30 MGD)

1. Flow: This permit does not include a numerical limitation for flow. Monitoring conditions are applied pursuant to N.J.A.C. 7:14A-13.13.

2. pH: The effluent limitations are based on the anti-backsliding provisions as cited in N.J.A.C. 7:14A-13.19.

3. Petroleum Hydrocarbons: The effluent limitations are based on N.J.A.C. 7:14A-12.8(c) and the anti-backsliding provisions as cited in N.J.A.C. 7:14A-13.19.

DSN 008A – Intake Screen Washwater (2.4 MGD)

1. Flow: Monitoring conditions for flow are applied pursuant to N.J.A.C. 7:14A-13.13 and to allow for a measure of intake screen washwater. A flow limit is not imposed at this outfall. No pollutants are added to this discharge as the discharge consists of canal water used for screen washwater.

DSN 009A – Discharge from Fish Sampling Pool (0 MGD)

1. Flow: Monitoring conditions for flow are applied pursuant to N.J.A.C. 7:14A-13.13 and to ensure that any operations at this discharge point are tracked. A flow limit is not imposed at this outfall. No pollutants are added to this discharge as the discharge consists of canal water used for the purposes of providing water in the fish sampling pool.

C. Intake Monitoring Requirements:

In order to calculate net limitations for outfall DSN 004A, intake monitoring is required for TSS and Petroleum Hydrocarbons, in accordance with N.J.A.C. 7:14A-6.5(b) and 11.2(a) 2, as described previously.

D. Effluent Monitoring Frequencies and Sample Types:

Monitoring frequencies and sample types are in accordance with N.J.A.C. 7:14A-14, unless specified otherwise in the permit. In accordance with N.J.A.C. 7:14A-14.2, the permittee may submit a written request for a modification of the permit to decrease monitoring frequencies for non-limited parameters listed in Part III if site specific conditions indicate the applicability of such a modification.

E. Recommended Quantitation Levels Policy (RQLs):

The Department developed the RQLs to insure that useful data is provided to the Department in order to characterize the discharger's effluent. The Department recommends that the permittee achieve detection levels that are at least as sensitive as the RQLs found in Part III. The Department has determined that the quantitation levels listed therein can be reliably and consistently achieved by most state certified laboratories for most of the listed pollutants using the appropriate procedures specified in 40 CFR Part 136. FAILURE TO ATTAIN A QUANTITATION LEVEL AS SENSITIVE AS A LISTED RQL IS NOT A VIOLATION OF THE PERMIT, BUT DOES TRIGGER SOME ADDITIONAL REPORTING REQUIREMENTS FOR THE PERMITTEE AS SPECIFIED IN PART IV A.1.c. OF THE PERMIT.

F. Reporting Requirements:

All data requested to be submitted by this permit shall be reported on the Discharge Monitoring Reports (DMRs), Waste Characterization Reports (WCR), and Residual Transfer Reports (RTR) as appropriate and submitted to the Department as required by N.J.A.C. 7:14A-6.8(a).

G. General conditions:

In accordance with N.J.A.C. 7:14A-2.3 and 6.1(b), specific rules from the New Jersey Administrative Code have been incorporated either expressly or by reference in Part I and Part II.

H. Operator Classification Number:

The operator classification requirement is no longer included in the permit. To obtain or determine the appropriate licensed operator classification for the treatment works specified, the permittee shall contact the Bureau of Engineering South at (609) 984-6840.

I. Residuals/Sludge Conditions:

All treatment works with a discharge regulated under N.J.A.C. 7:14A must have permits that implement applicable technical standards for residuals management. Generally, the permit issued to the treatment works generating the residual will include applicable residual quality monitoring as well as other general conditions required by N.J.A.C. 7:14A-6. In addition, the permit may include conditions related to any aspect of residual management developed on a case-by-case basis where the Department determines that such conditions are necessary to protect public health and the environment.

The permit may also include conditions establishing requirements for treatment works that send residual to other facilities for final use or disposal. Thus, **ALL** residual preparers (that is, generators as well as persons who manage the residual) are required to submit basic information concerning their residual use and disposal practices. This basic information is submitted by compliance with the Sludge Quality Assurance Regulations (N.J.A.C. 7:14C).

The documents listed below have been used to establish the residual conditions of the Draft Permit:

a. United States Environmental Protection Agency "Standards for the use or disposal of sewage sludge" (40 CFR Part 503),
b. "New Jersey Pollutant Discharge Elimination System" (N.J.A.C. 7:14A),
c. Technical Manual for Residuals Management, May 1998,
d. USEPA Part 503 Implementation Guidance, EPA 833-R-95-001, October 1995. This document is a compilation of federal requirements, management practices and EPA recommended permit conditions for sewage sludge use and management practices,
e. USEPA A Plain English Guide to the EPA Part 503 Biosolids Rule, EPA/832/R-93/003, September 1994,

f. New Jersey "Statewide Sludge Management Plan", November 1987 and
g. New Jersey "Sludge Quality Assurance Regulations" (SQAR), N.J.A.C. 7:14C.

J. Biocides or Other Cooling Water Additives:

The Department has approved the permittee's request to chlorinate non-contact cooling water. In accordance with 40 CFR 423.13(b)(2), chlorine produced oxidants may not be discharged from any single generating unit for more than two hours per day. Simultaneous multi-unit chlorination is permitted.

If the permittee decides to begin using any additional additives in the future, the permittee must notify the Bureau of Point Source Permitting – Region 1 at least 180 days prior to use so that the permit may be reopened to incorporate any additional limitations deemed necessary.

11 Description of Procedures for Reaching a Final Decision on the Draft Action:

Please refer to the procedures described in the public notice that is part of the draft permit. The public notice for this actions is published in the *Ocean County Observer* and in the DEP Bulletin.

12 Contact Information

If you have any questions regarding this permit action, please contact Susan Rosenwinkel, Bureau of Point Source Permitting at (609) 292-4860.

13 Permit Summary Tables

Unless otherwise noted all effluent limitations are expressed as maximums. Dashes (--) indicate there is no effluent data, no limitations, or no monitoring for this parameter depending on the column in which it appears.

DSN 001A

PARAMETER (1)	UNITS	AVERAGING PERIOD	WASTEWATER DATA (2)	EXISTING LIMITS	FINAL LIMITS
Flow	MGD	Monthly Avg. Daily Max.	597 662.4	MR MR	MR MR
Temperature Difference Between Intake and Discharge (Option 1)	°C	Monthly Avg. Instant Max.	10.64 12.2	MR 12.8	MR 12.8
Temperature Difference Between Intake and Discharge (Option 2)	°C	Monthly Avg. Instant Max.	10.3 17.2	MR 18.3	MR 18.3
Effluent Temperature (Option 1)	°C	Monthly Avg. Instant Max.	28.7 41.1	MR 41.1	MR 41.1
Effluent Temperature (Option 2)	°C	Monthly Avg. Instant Max.	21.2 40	MR 43.3	MR 43.3
Intake Temperature	°C	Monthly Avg. Instant Max.	20.9 31.1	MR MR	MR MR
Effluent pH	Su	Instant Min. Instant Max.	7.3 8.2	6.5 (3) 8.5 (3)	6.5 (3) 8.5 (3)
Intake pH	Su	Instant Min. Instant Max.	7.5 8.3	MR MR	MR MR
Chlorine Produced Oxidants – Normal Operations (Option 1)	kg/d	Monthly Avg. Daily Max.	8.9 33.43	MR 41.7	MR 41.7
Chlorine Produced Oxidants – Normal Operations (Option 1)	mg/L	Monthly Avg. Daily Max.	0.1 0.2	MR 0.2	MR 0.2
Chlorine Produced Oxidants – During operation of the turbine building closed cooling water heat exchanger (Option 2)	mg/L	Monthly Avg. Daily Max.	0.1 0.1	MR 0.2	MR 0.2
Intake Velocity	Ft/sec	Monthly Avg. Daily Max.	0.675 1.5	MR 2.2	MR 2.2
Net Rate of Heat	MBTU/hr	Monthly Avg. Daily Max.	4156 4483	MR 5420	MR 5420
Net Rate of Heat	MBTU/hr	Monthly Avg. Daily Max.	2693 4446	MR 5700	MR 5700
Acute Toxicity, LC50	%	Minimum	>100	MR	MR

Footnotes and Abbreviations:

MR Monitor and report only

(1) Consistent with the existing permit, the Department has continued effluent limitations for effluent temperature, temperature difference between intake and discharge, net rate of addition of heat, and CPO under two scenarios that are identified in this permit as Option 1 and Option 2 limits. Option 1 heat and temperature limits are applicable when four circulating water pumps are operating for condenser cooling. Option 2 heat and temperature limits shall be applicable during periods of condenser backwash, intake component maintenance or during a Maximum Emergency Generating Event. Option 1 CPO limits are applicable to DSN 001A. Option 2 CPO limits are applicable during periods of chlorination of the turbine building closed CW heat exchanger. An explanation of these conditions is also reiterated as items A.1.j.(CPO), G.1.g. , G.1.j and G.1.i.. of Part IV.

(2) Wastewater data originates from the information submitted on the monitoring report forms from 1/04 to 12/04.

(3) During periods when the pH of the intake water is less than 6.5, the pH of the effluent shall not be less than that of the intake; or, during periods when the pH of the intake water is greater than 8.5, the pH of the effluent shall not be greater than that of the intake.

(4) Monitoring of the parameters listed above for DSN 001A is not required when there is no flow and/or heat load across the Station's main condensers.

DSN 002A

PARAMETER	UNITS	AVERAGING PERIOD	WASTEWATER DATA (1)	EXISTING LIMITS	FINAL LIMITS
Flow	MGD	Monthly Avg. Daily Max.	3.16 5.4	MR MR	MR MR
Temperature Difference Between Intake and Discharge	°C	Monthly Avg. Instant Max.	3.5 11	MR 18.3	MR 18.3
Effluent Temperature	°C	Monthly Avg. Instant Max.	18.1 34.3	MR 45	MR 45
Intake Temperature	°C	Monthly Avg. Instant Max.	17.1 30.6	MR MR	MR MR
Effluent pH	Su	Instant Min. Instant Max.	7.2 8.3	6.5 (2) 8.5 (2)	6.5 (2) 8.5 (2)
Intake pH	Su	Instant Min. Instant Max.	7.5 8.3	MR MR	MR MR
Chlorine Produced Oxidants	mg/L	Monthly Avg. Daily Max.	0.1 0.2	MR 0.2	MR 0.2
Net Rate of Addition of Heat	MBTU/Hour	Monthly Avg. Daily Max.	7.4 41	MR 790	MR 790
Acute Toxicity, LC50	%	Minimum	>100	MR	MR

Footnotes and Abbreviations:

MR Monitor and report only

(1) Wastewater data originates from the information submitted on the monitoring report forms from 1/04 to 12/04.

(2) During periods when the pH of the intake water is less than 6.5, the pH of the effluent shall not be less than that of the intake; or, during periods when the pH of the intake water is greater than 8.5, the pH of the effluent shall not be greater than that of the intake.

DSN 004A

PARAMETER	UNITS	AVERAGING PERIOD	WASTEWATER DATA (1)	FINAL LIMITS
Net Flow (2)	MGD	Monthly Avg. Daily Max.	0.06 0.06	MR MR
Effluent Flow	MGD	Monthly Avg. Daily Max.	8.66 8.66	MR MR
Heat Exchanger Flow	MGD	Monthly Avg. Daily Max.	8.60 8.60	MR MR
Effluent Temperature	°C	Monthly Avg. Instant Max.	20.3 30	MR 37.2
Effluent pH	S.U.	Instant Min. Instant Max.	7.8 8.2	6.0 (3) 9.0 (3)
Intake pH	S.U.	Instant Min. Instant Max.	7.5 8.3	MR MR
Chlorine Produced Oxidants	Mg/L	Monthly Avg. Daily Max.	0.1 0.1	MR 0.2
Total Organic Carbon	Mg/L	Monthly Avg. Daily Max.	4.6 7	MR 50
Net Petroleum Hydrocarbons	Mg/L	Monthly Avg. Daily Max.	0.0 0.0	10 15
Net Petroleum Hydrocarbons	Kg/day	Monthly Avg. Daily Max.	0.0 0.0	MR 4.54
Effluent Petroleum Hydrocarbons	Mg/L	Monthly Avg. Daily Max.	- 0.64 19.6	MR MR
Intake Petroleum Hydrocarbons	Mg/L	Monthly Avg. Daily Max.	- 0.148 4.4	MR MR
Net Total Suspended Solids	Mg/L	Monthly Avg. Daily Max.	22.2 43.4	30 100
Net Total Suspended Solids	Kg/day	Monthly Avg. Daily Max.	-0.148 4.4	MR 22.7
Effluent Total Suspended Solids	Mg/L	Monthly Avg. Daily Max.	22.2 43.4	MR MR
Intake Total Suspended Solids	Mg/L	Monthly Avg. Daily Max.	22.8 49.8	MR MR
Acute Toxicity, LC50	%	Minimum	>100	MR

Footnotes and Abbreviations:

MR Monitor and report only

(1) Wastewater data originates from the information submitted on the monitoring report forms from 1/04 to 12/04.

(2) Net flow shall be used for calculating loading values only for this outfall. The equation Qnet = Qactual – Qheat exchanger.

(3) During periods when the pH of the intake water is less than 6.0, the pH of the effluent shall not be less than that of the intake; or, during periods when the pH of the intake water is greater than 9.0, the pH of the effluent shall not be greater than that of the intake.

DSN 005A

PARAMETER	UNITS	AVERAGING PERIOD	WASTEWATER DATA (1)	FINAL LIMITS
Flow	MGD	Monthly Avg. Daily Max.	696 749	MR MR

Footnotes and Abbreviations:

MR Monitor and report only

(1) Wastewater data originates from the information submitted on the monitoring report forms from 1/04 to 12/04.

DSN 007A

PARAMETER	UNITS	AVERAGING PERIOD	WASTEWATER DATA (1)	FINAL LIMITS
Flow	GPD	Monthly Avg. Daily Max.	26.6 26.6	MR MR
Petroleum Hydrocarbons	mg/L	Monthly Avg. Instant Max.	<0.5 <0.5	10 15

Footnotes and Abbreviations:

MR Monitor and report only

(1) Wastewater data originates from the information submitted on the monitoring report forms from 1/04 to 12/04. A discharge only occurred during the months of 5/04 and 6/04.

DSN 008A

PARAMETER	UNITS	AVERAGING PERIOD	WASTEWATER DATA (1)	FINAL LIMITS
Flow	MGD	Monthly Avg. Daily Max.	2.4 4.4	MR MR

Footnotes and Abbreviations:

MR Monitor and report only

(1) Wastewater data originates from the information submitted on the monitoring report forms from 1/04 to 12/04.

DSN 009A

PARAMETER	UNITS	AVERAGING PERIOD	WASTEWATER DATA (1)	FINAL LIMITS
Flow	MGD	Monthly Avg. Daily Max.	No Discharge No Discharge	MR MR

Footnotes and Abbreviations:

MR Monitor and report only

(1) Wastewater data originates from the information submitted on the monitoring report forms from 1/04 to 12/04.

14 Contents of the Administrative Record

The following items are used to establish the basis of the Draft Permit:

1. 33 U.S.C. 1251 et seq., Federal Water Pollution Control Act. [C]
2. 40 CFR Part 131, Federal Water Quality Standards. [A] [C]
3. 40 CFR Part 122, National Pollutant Discharge Elimination System. [C]
4. N.J.S.A. 58:10A-1 et seq., New Jersey Water Pollution Control Act. [A] [B]
5. N.J.A.C. 7:14A-1 et seq., New Jersey Pollutant Discharge Elimination System Regulations. [A] [B]
6. N.J.A.C. 7:9B-1 et seq., New Jersey Surface Water Quality Standards. [A] [B]
7. N.J.A.C. 7:9-5.1 et seq., Wastewater Discharge Requirements. [A] [B]
8. N.J.A.C. 7:15, Statewide Water Quality Management Planning Rules. [A] [B]
9. N.J.A.C. 7:14C, Sludge Quality Assurance Regulations. [B]
10. "Field Sampling Procedures Manual", published by the NJDEP. [A]
11. "Discharge Monitoring Report (DMR) Instructional Manual", published by the NJDEP. [A]
12. "EPA Technical Support Document for Water Quality-based Toxics Control", EPA/505/2-90-001, March 1991. [A]
13. 1998 "Identification and Setting of Priorities for Section 303(d) Water Quality Limited Waters in New Jersey" report. [A] [B]
14. NJPDES/DSW Permit Application dated 6/3/99. [A]
15. Existing NJPDES/DSW Permit NJ0005550, issued 10/21/94 and effective 12/1/94. [A]
16. Major Modification to NJPDES/DSW Permit NJ0005550, issued 4/17/96 and effective on 6/1/96.[A]
17. Major Modification to NJPDES/DSW Permit NJ0005550, issued 11/27/96 and effective on 12/1/96.[A]
18. Site visits on November 6, 2003 and March 4, 2005.
19. DMR data, 1/02 – 6/03.
20. "Final Comprehensive Conservation and Management Plan", issued May, 2002 by EPA Region II, NJDEP, and interested Ocean County stakeholders.
21. Section 316(b) Regulations for Phase II facilities, 40 CFR 125, effective 9/7/04.
22. Existing NJPDES/DSW Permit NJ0005622 issued to PSEG-Salem on 6/29/99 and effective 8/1/2001.
23. Plan of Study for Analysis of Alternatives for Dilution Pump Operation at the Oyster Creek Nuclear Generating Station, May 1995 (EA Engineering, Science, and Technology).
24. Technical Review and Evaluation of Thermal Effects Studies and Cooling Water Intake Structure Demonstration of Impact for the Oyster Creek Nuclear Generating Station, Revised Final Report, Versar, Inc., May 1989.
25. Technical Review and Evaluation of Thermal Effects Studies and Cooling Water Intake Structure Demonstration of Impact for the Oyster Creek Nuclear Generating Station, Advanced Final Report, Versar, Inc., 1988 and comments received thereon.
26. Jersey Central Power & Light Company Section 316 Demonstration for Oyster Creek and Forked River Nuclear Generating Stations, May 1978.
27. 40 CFR Part 423, Steam Electric Power Generating Point Source Category.
28. 1966 Stipulation of the State of NJ, Department of Public Utilities, Board of Public Utility Commissioners.
29. United States Army Corps of Engineer's Report entitled "Draft Conceptual Design Alternatives and Associated Tasks for Environmental Restoration Feasibility Study" dated December 6, 2001.

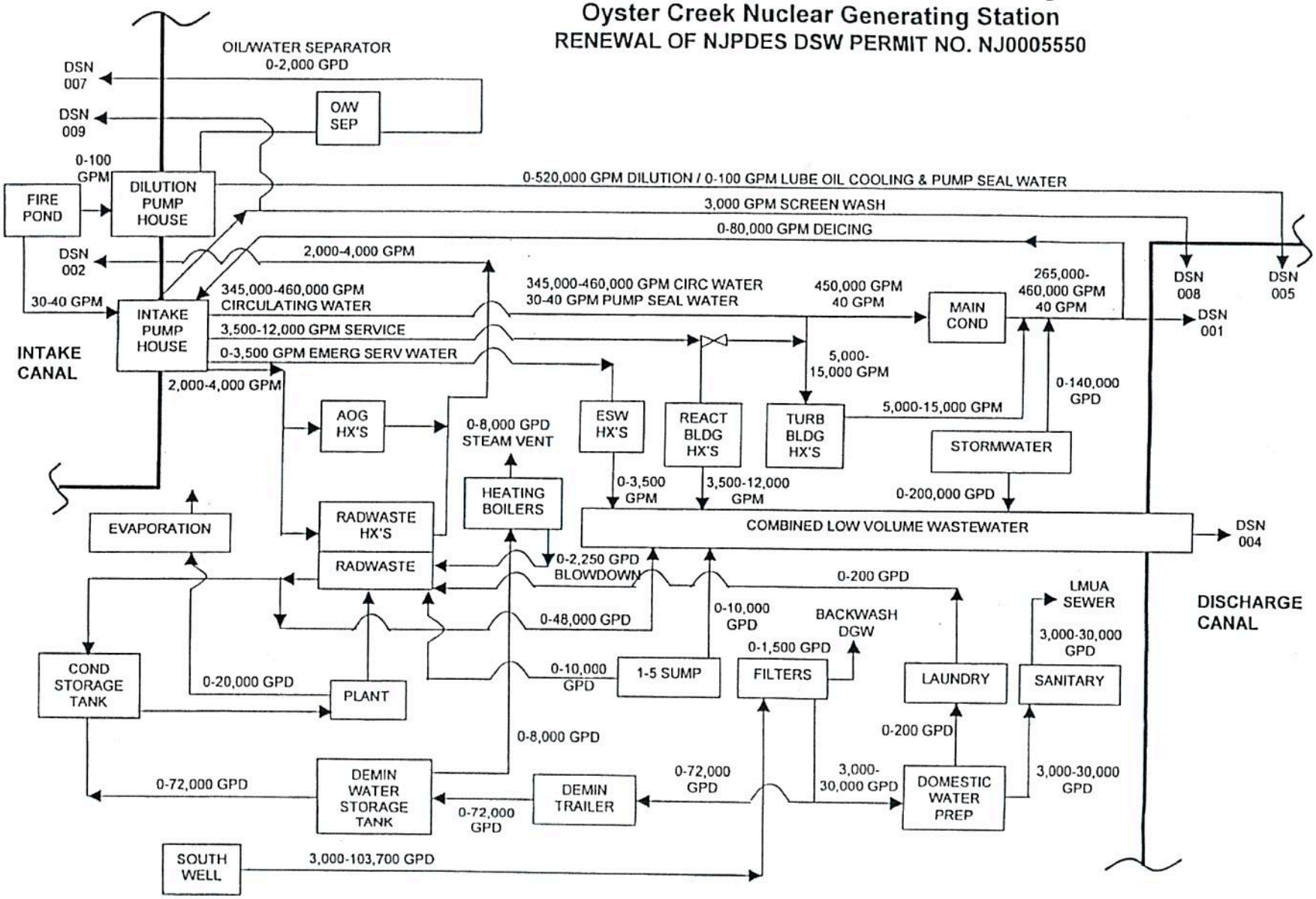
Footnotes:

[A] Denotes items that may be found in the NJPDES/DSW Administrative Record Library located in the NJDEP Central File Room, 401 East State Street, Trenton, New Jersey.

[B] Denotes items that may be found on the New Jersey Department of Environmental Protection (NJDEP) website located at "http://www.state.nj.us/dep/".

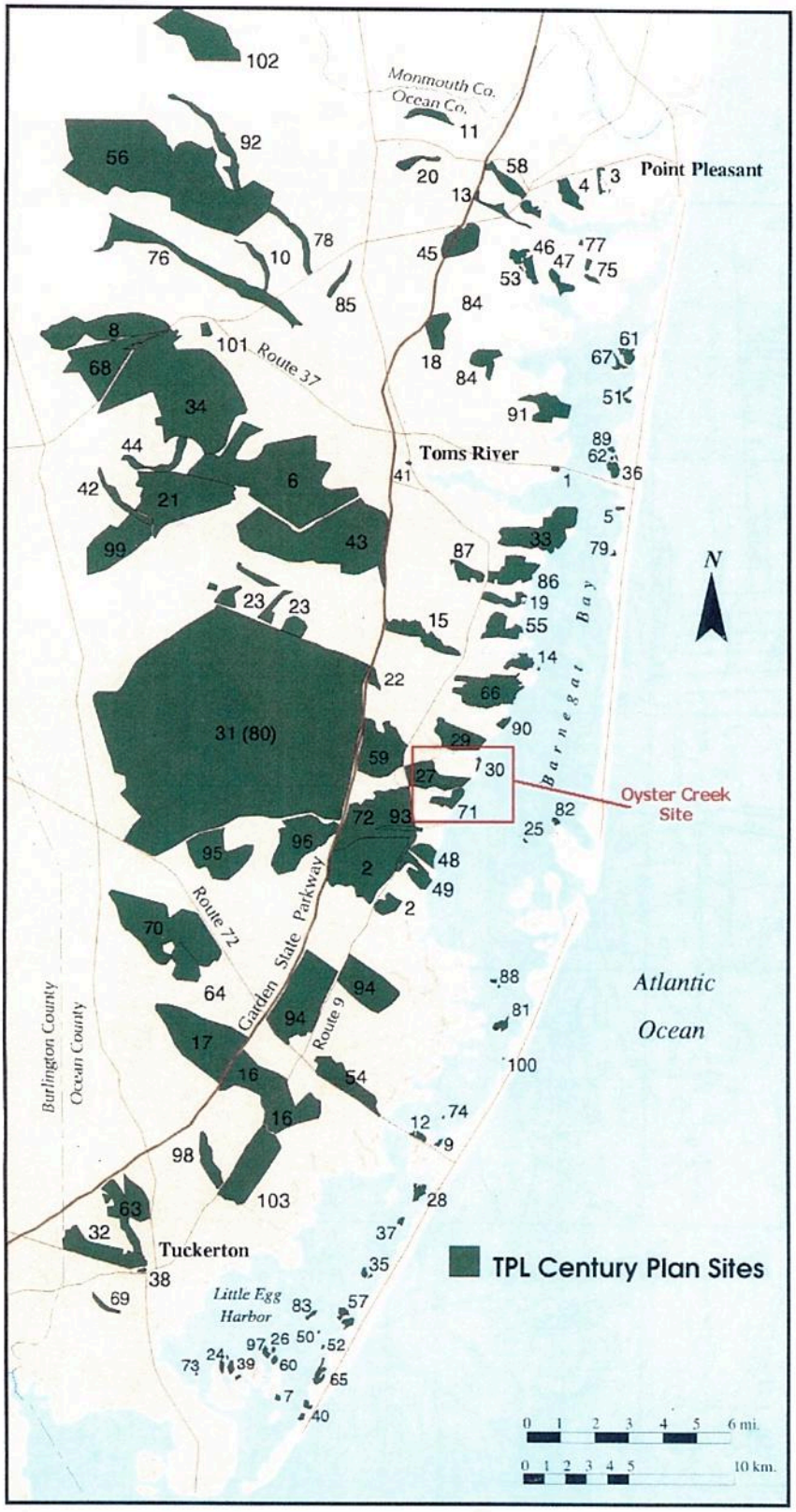
[C] Denotes items that may be found on the United States Environmental Protection Agency (USEPA) website at "http://www.epa.gov/".

Figure 1. Form C Item 3.B. Line Drawing
Oyster Creek Nuclear Generating Station
RENEWAL OF NJPDES DSW PERMIT NO. NJ0005550



Forked River Beach
BEACH
PENSACOLA
DR
SEAWALLS
Vincent Clun Park
Radio Tower
Substation
Powerplant
BM 18
SEAWALL
Site
Gate
Boat Ramp
PARKWAY
Rest Area
Gate
Holiday Beach
Gravel Pits
DRIVE
Park
LIGHTHOUSE
BM 15
Ocean Community Cem
Light
Seawalls
Park
BM 17
Boat Ramp
BM 6
Waretown
Cedar Grove Ceme
Cem
PO
O C E A N
BM 17
BARNEGAT BEACH
PANCOAST
ROAD
Sandpit

Trust for Public Land Century Plan Sites



This map portrays the Trust for Public Land's one hundred original Century Plan *sites (1995) and three additional sites selected by Herpetological Associates.*

1. Anchor Reef Marina
2. Barnegat Bay Beach Inland Area
3. Beaver Dam Creek/North Branch
4. Beaver Dam Creek/South Branch
5. Berkeley Harbor Marina
6. Berkeley Triangle
7. Blake Whale Sedge
8. Black and Ruckels Branches
9. Bonner Island
10. Cabin Branch
11. Cabinfield Branch
12. Cedar Bonner Island
13. Cedar Bridge Branch
14. Cedar Creek Point/Lanoka Harbor
15. Cedar Creek South
16. Cedar Run Creek/East of Parkway
17. Cedar Run Creek/Northwest Extension
18. Church Road Property
19. Clamming Creek
20. Cotterals Branch
21. Davenport Branch West
22. Deer Head Lake North
23. Double Trouble State Park Out Parcels
24. Drag Sedge and Hester Sedge
25. Dredge Spoil Islands
26. East Sedge
27. Finninger Farm
28. Flat Island and Islets
29. Forked River Annex and Adjacent Uplands
30. Forked River Beach
31. Forked River Mountains and Vicinity
32. Giffords Mill Branch
33. Good Luck Point
34. Green, Big Wrangle, and Run Branches
35. Ham Island and Islets
36. Harbor Island (with Al's Island)
37. High Island
38. Historic Seaport Project
39. Hither Island
40. Holgate Marshes
41. Huddy Park/Proposed Expansion
42. Irish Branch
43. Jake's Branch Corridor
44. Keswick Lake Corridor
45. Kettle Creek/Green Branch
46. Kettle Creek North
47. Kettle Creek Peninsula (Chamberlain Point)
48. Liberty Harbor
49. Lighthouse Camp and Bowker Property
50. Little Island
51. Little Sedge Island
52. Lower Little Island (Post Island)
53. Mallard Point
54. Manahawkin Baptist Church Tract
55. Maple Creek
56. Maple Root Branch and Long Brook
57. Marsh-Elder Island
58. Metedeconk River/Forge Pond
59. Middle Branch/Forked River
60. Middle Sedge
61. Middle Sedge Island
62. Mike's Island with Bill's and Wilde's Island
63. Mill Branch/Tuckerton Creek
64. Mill Creek West
65. Mordecai Island
66. Murray Grove/Stouts Creek
67. Northwest Point Island
68. Old Hurricane Brook
69. Otis Bogs/Willis Creek (Tuckers Bog)
70. Oxly Tract
71. Oyster Creek/Sands Point Harbor
72. Pancoast Inland Area
73. Parkers Island
74. Pettit Island
75. Reedy Creek Additions
76. Ridgeway Branch
77. Riverside Woods
78. Riverwood Park Extensions
79. Roberts Avenue Marsh
80. Sand and Gravel Mining Sites
81. Sandy Island
82. Sedge Island
83. Shelter Island
84. Silver Bay Westward Extensions
85. Slab Branch
86. Sloop Creek Road Area
87. Sloop Creek Western Extension
88. Sloop Sedge and Islet
89. Stooling Point Island
90. Sunrise Beach
91. Tilton Point
92. Toms River/Dove Mill Branch
93. Waretown Creek
94. Waterford
95. Wells Mills Girl and Boy Scout Camps
96. Wells Mills Park - Area 'E'
97. West Sedge
98. Westecunk Creek
99. Whiting Clay Pits
100. Woods Island
101. Lakehurst Bog
102. South Branch/Metedeconk River
103. Coxtown