

AmerGen Energy Company, LLC  
Oyster Creek  
US Route 9 South  
PO Box 388  
Forked River, NJ 08731-0388

Technical Specifications  
Appendix B, Section 3.5.1(A)

March 31, 2003  
2130-03-20081  
2120-032-2762

U.S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555

Dear Sir:

Subject: OYSTER CREEK GENERATING STATION (OCGS)  
DOCKET NO. 50-219  
ANNUAL ENVIRONMENTAL OPERATING REPORT (AEOR) - 2002

Enclosed are two copies of the 2002 Annual Environmental Operating Report (AEOR) for the Oyster Creek Generating Station. The AEOR is submitted in accordance with Appendix B, Section 3.5.1(A) of the Oyster Creek Environmental Technical Specifications, as well as Condition 10 of the Incidental Take Statement of the OCGS Endangered Species Act, Section 7 Consultation, Biological Opinion.

If you have any questions concerning this submittal, please contact Mr. John Rogers, of my staff, at 609-971-4893.

Sincerely,

*Michael J. Massaro for E. HARKNESS*

Ernest J. Harkness P.E.  
Vice President  
Oyster Creek

EJH/MB/JR  
Enclosure  
Attachments

cc: Administrator, Region I  
NRC Project Manager  
Senior Resident Inspector

*IE25*

**2002**

**ANNUAL ENVIRONMENTAL OPERATING REPORT**

**ENCLOSURE**

**OYSTER CREEK GENERATING STATION**

**LICENSE NO. DPR-16**

**DOCKET NO. 50-219**

**Prepared by:**

**AMERGEN ENERGY COMPANY, LLC**

**March 2003**

## **1.0 Introduction**

The Annual Environmental Operating Report (AEOR) provides a summary of the non-radiological environmental monitoring activities at the Oyster Creek Generating Station (OCGS) during the past year. The AEOR is required by Oyster Creek Environmental Technical Specification (OCETS) Appendix B, Section 3.5.1(A), as well as Condition 10 of the Incidental Take Statement of the OCGS Endangered Species Act, Section 7 Consultation, Biological Opinion. This AEOR covers the period from January 1, 2002 through December 31, 2002.

The OCGS is a boiling water reactor of 619 MWe maximum (summer) dependable net capacity, owned and operated by AmerGen Energy Company, LLC. The OCGS is located in Lacey Township, Ocean County, New Jersey. The plant is subject to Operating License No. DPR-16. The date of initial reactor criticality was May 3, 1969 and the commercial generation of power began on December 23, 1969.

## **2.0 Environmental Monitoring**

This section is intended to address the results of environmental monitoring required to be implemented by Section 1.1 "Fish Kill Monitoring Program" of the OCETS during the reporting period. A reportable fish kill event occurred at the OCGS subsequent to a maintenance activity conducted September 23, 2002. The dilution plant, which is energized by the Bank 5 Transformer, had been secured to facilitate taking the Bank 5 Transformer out of service for maintenance. This resulted in a condition which is not allowed by the OCGS New Jersey Pollutant Discharge Elimination System (NJPDES) Discharge to Surface Water (DSW) Permit. A maximum Route 9 Bridge temperature of 38.3 °C (101.0 °F) occurred approximately three hours after shutdown of the dilution pumps. Upon discovery of the non-compliance, immediate and uninterrupted actions were taken to restore the dilution plant to service. Notifications were made to the USNRC and NJDEP.

Approximately one hour after the dilution pumps were shut off, a Plant Equipment Operator notified the Control Room that about 50 to 100 dead or stressed fish were observed in the discharge canal near the dilution pump discharge. In order to document this fish kill event, a fish sampling program was conducted by AmerGen Energy on the day of the dilution pump shutdown and the days immediately following the shutdown. The results of that monitoring effort indicated that several species of fish were affected, and that a total of approximately 5876 fish and invertebrates died due to thermal shock. The majority of the fish which died as a result of the dilution pump shutdown suffered lethal heat shock relatively rapidly.

Subsequently, an Administrative Order and Notice of Civil Administrative Penalty Assessment dated December 11, 2002 was issued to AmerGen Energy citing the permit violations which occurred on September 23, 2002 and the natural resources damages which resulted from these permit violations.

### 3.0 Special Monitoring and Study Activities

Incidental Capture Reports documenting the circumstances of incidental captures of sea turtles during the reporting period are included in this report in accordance with Condition 10 of the Incidental Take Statement of the OCGS Endangered Species Act, Section 7 Consultation, Biological Opinion. Incident reports concerning the capture of endangered sea turtles entitled "Sea Turtle Incidental Capture Report 2002-1, and 2002-2" are provided as Attachments II and III, respectively. The circumstances surrounding the two incidental captures that occurred during 2002 are summarized below. In both cases the incidental captures were reported to the Nuclear Regulatory Commission and the National Marine Fisheries Service within 24 hours of capture. Inspections and cleaning of cooling water intake trash bars continue to be conducted in accordance with Conditions 1 and 4 of the Incidental Take Statement.

#### Annual Summary of Sea Turtle Incidental Takes

During the early morning on June 29, 2002, a sea turtle was observed swimming freely in Bay No. 5 and Bay No. 6 of the circulating water intake structure. The turtle was found to be apparently healthy and moving about normally, although a scar of unknown origin was observed on the right side of the carapace. OCGS Environmental personnel took possession of the turtle and determined it to be a juvenile Kemp's ridley sea turtle (*Lepidochelys kempfi*). The turtle was taken to the Marine Mammal Stranding Center (MMSC) in Brigantine, New Jersey. The turtle died while at MMSC and a necropsy was performed.

During the morning of July 3, 2002, a sea turtle was gently removed from in front of the dilution water system intake structure. The turtle was found to be alive and apparently healthy at the time of capture, although a small scrape was found on one of the dorsal scutes. The turtle was taken to the MMSC and was subsequently released on July 9, 2002.

Regarding trends in the number of incidental sea turtle captures at the OCGS, two incidental captures occurred during 2002 which is nearly identical to the longterm average of slightly over two incidental captures per year recorded over the last decade.

The annual total of two incidental captures during 2002 is a reduction from the total of three sea turtles incidentally captured at OCGS during 2001. However, the annual abundance of sea turtles in this vicinity appears to be highly variable, unpredictable, and unrelated to the operation of the OCGS. There are several factors that may influence the number of sea turtle incidental captures which occur at the OCGS. Barnegat Inlet, the only tidal inlet in the vicinity of Oyster Creek, which provides access to Barnegat Bay from the Atlantic Ocean, was deepened during dredging operations in the early 1990's. Completion of the Barnegat Inlet dredging operation resulted in an increase in the tidal prism, or volume of water entering and exiting the inlet on a single tidal cycle, as well as a slightly greater tidal range at Oyster Creek.

The deepening of Barnegat Inlet and associated waterway channels was completed immediately prior to 1992, when incidental captures of sea turtles began to occur at OCGS, and may partially explain the occurrence of the turtles.

It is likely that the local variability of sea turtle abundance is also related to biological factors including the abundance of organisms on which sea turtles prefer to feed, such as blue crabs, horseshoe crabs, and calico crabs. Physical factors, such as an oceanic front or an oceanic gyre occurring unusually close to Barnegat Inlet, may also play a part in the prevalence of sea turtles near Oyster Creek because oceanic fronts have been shown to be used as a migratory and forage habitat by sea turtles (Polovina et al, 2000). Experience has also shown that the passage of a severe storm or pressure system near Barnegat Inlet can cause major increases in winds, waves, tides and tidal prism in shallow estuarine waters such as Barnegat Bay. These events could increase the likelihood of slowly swimming organisms such as sea turtles occurring in the estuary.

Many years of environmental sampling conducted near the OCGS have repeatedly demonstrated that the abundance of various marine organisms can vary considerably from year to year, often by orders of magnitude. This is particularly true for seasonal migrants, whose abundance in Barnegat Bay is highly dependent upon physical and biological factors along the migratory route. Therefore, the observed annual variation in sea turtle incidental captures at the OCGS from a minimum of zero to a maximum of five per year is not considered particularly significant. The ultimate goal of the considerable effort being put forward at the OCGS for the protection of sea turtles is to protect the turtles that do arrive at the plant, and to release as many turtles as possible to safety. The OCGS program for the protection of threatened and endangered sea turtles can be considered to be quite successful because most of the sea turtles incidentally captured at OCGS since 1992 have subsequently been released alive and well, to the Atlantic Ocean in locations free from potential cold-shock, due to the efforts of OCGS personnel.

#### **4.0 Additional Information**

This section provides additional information that is required by Section 3.5.1 of the Appendix B OCETS.

#### **4.1 Summary of OCETS Non-Routine Environmental Operating Reports (NEOR) and the corrective action taken to remedy them.**

There was one NEOR during 2002, reporting the fish kill event of September 23, 2002. Refer to Attachment I to this Enclosure.

**4.2 Summary of changes made to state and federal permits and certificates which pertain to the requirements of the OCETS.**

There was one proposed change to the NJPDES permit requiring a 30 day notice of scheduled maintenance which could affect the environment. This was contained in the Administrative Order and Notice of Civil Administrative Penalty Assessment dated December 11, 2002. This change is currently in discussion. Refer to Attachment I to this Enclosure.

**4.3 Summary of changes in station design which could involve an environmental impact.**

There were no changes in station design during the reporting period, which could involve an environmental impact.

**4.4 Summary of changes to the OCETS**

There were no changes to the OCETS during the reporting period.

**References**

Polovina, J.J., D.R. Kobayashi, D.M. Ellis, M.P. Seki, and G.H. Balazs. 2000. Turtles on the edge: Movement of loggerhead turtles (*Caretta caretta*) along oceanic fronts in the central North Pacific, 1997-1998. *Fish. Oceanogr.*, 9: 71-82.

**ENCLOSURE I**  
**ATTACHMENT I**

DOCKET 50-219

**FISH KILL MONITORING REPORT FOR SEPTEMBER 2002**

## OYSTER CREEK GENERATING STATION

### Thermal Exceedance and Fish Kill event of September 23, 2002

A reportable fish kill event occurred at the OCGS subsequent to a maintenance activity conducted September 23, 2002. On the morning of September 23, 2002, the OCGS was operating at 100% power. The dilution plant, which is energized by the Bank 5 Transformer, had been secured to facilitate taking the Bank 5 Transformer out of service for maintenance. This maintenance would not only increase the level of safety during the upcoming refueling outage, but also improve the reliability of a transformer and associated electrical equipment which tie the OCGS to the offsite electrical grid. The dilution pumps were secured and the Bank 5 Transformer was taken out of service by 2:37 AM. This resulted in a condition which is not allowed by the OCGS New Jersey Pollutant Discharge Elimination System (NJPDES) Discharge to Surface Water (DSW) Permit. Upon discovery of the non-compliance, immediate and uninterrupted actions were taken to restore the dilution plant to service. Notifications were made to the USNRC and NJDEP (Attachment I, References 1, 2, and 3). Subsequently, an Administrative Order and Notice of Civil Administrative Penalty Assessment dated December 11, 2002 was issued to AmerGen Energy citing the permit violations which occurred on September 23, 2002 and the natural resources damages which resulted from these permit violations (Reference 4).

Prior to the shutdown of the dilution pumps, water temperatures at the Main Condenser Discharge and Route 9 Bridge were approximately 38.9 °C (102 °F) and 32.7 °C (90.9 °F), respectively. These temperatures remained relatively constant for approximately 45 minutes. However, in the absence of thermal mixing from dilution pump operation, downstream water temperatures within the discharge canal began rising rapidly beginning at 3:25 AM. Route 9 Bridge temperature reached 36.1 °C (97 °F) by 3:43 AM and 37.8 °C (100 °F) by 4:13 AM.

A maximum Route 9 Bridge temperature of 38.3 °C (101.0 °F) occurred approximately three hours after shutdown of the dilution pumps. Route 9 Bridge temperatures remained about 37.8 °C (100 °F) for several hours until dilution pump operation was restored, which reduced temperatures at Route 9 Bridge to under 30.6 °C (87 °F). Figures 1 & 2 document these changes in water temperatures subsequent to the cessation of dilution pump operation.

Approximately one hour after the dilution pumps were shut off, a Plant Equipment Operator notified the Control Room that about 50 to 100 dead or stressed fish were observed in the discharge canal near the dilution pump discharge. In order to document this fish kill event, a fish sampling program was conducted by AmerGen Energy on the day of the dilution pump shutdown and the days immediately following the shutdown. The results of that monitoring effort indicated that several species of fish were affected, and that a total of approximately 5876 fish and invertebrates died due to thermal shock. The majority of the fish which died as a result of the dilution pump shutdown suffered lethal heat shock relatively rapidly.

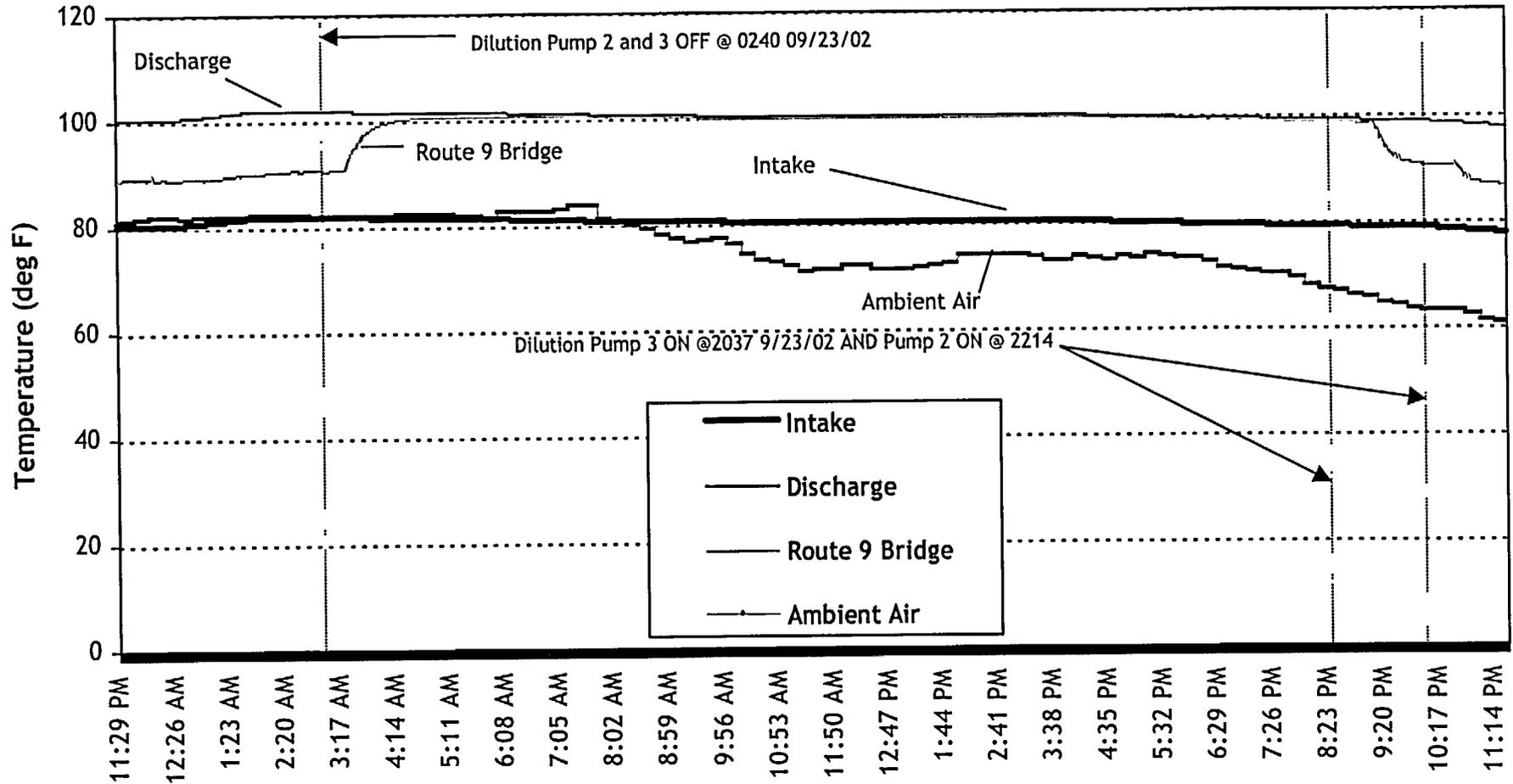
Nearly three-quarters of the fish collected from the discharge canal and Oyster Creek were striped bass, Atlantic menhaden and white perch. Spot and American eel each comprised about an additional five percent of the fish collected. Although 17 other fish species and two invertebrate species were also involved in the fish kill, most of these species comprised less than one percent of the total number collected (Attachment I, Table 1).

### References

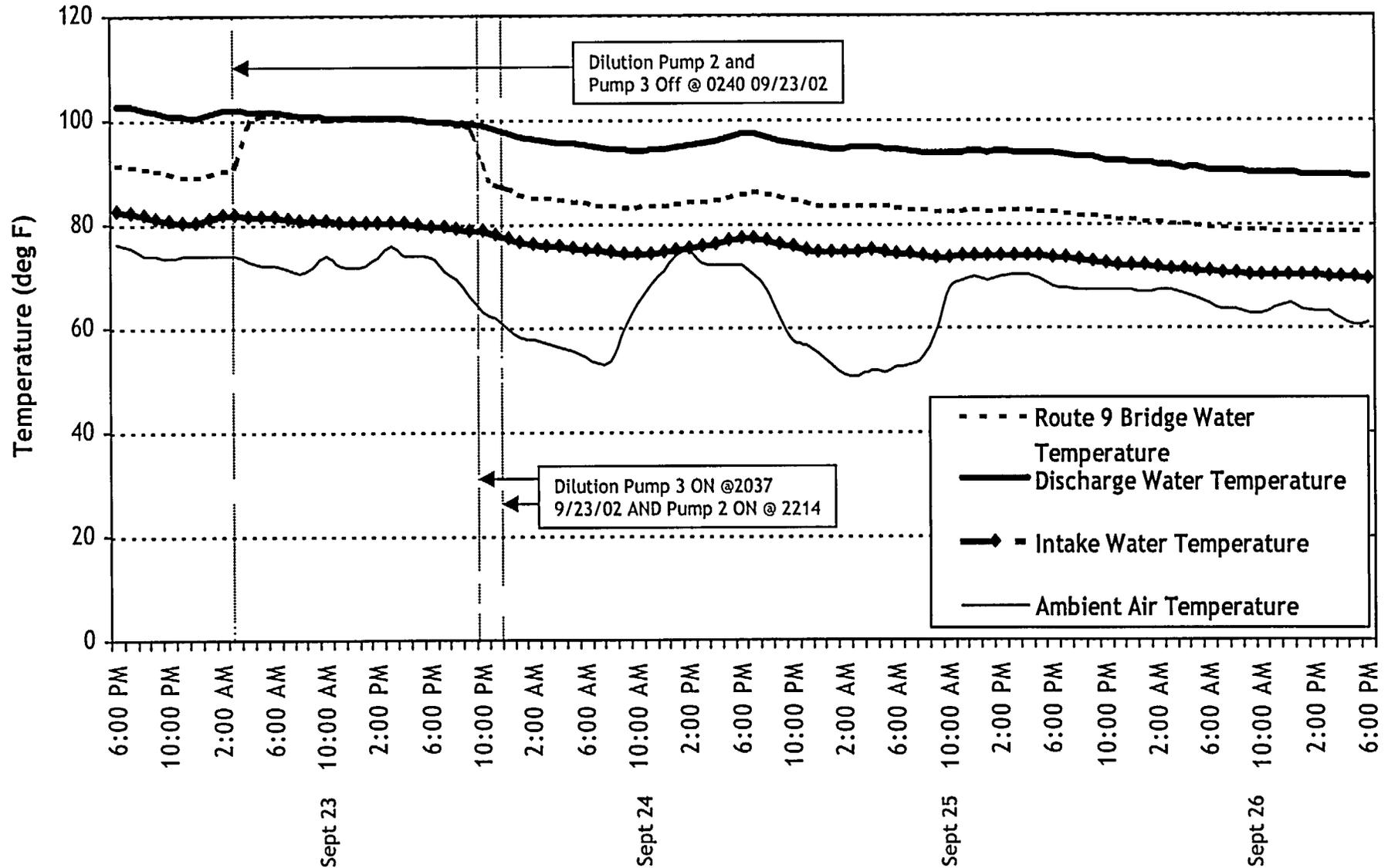
1. Letter 2130-02-20270, Harkness (AmerGen) to Van Sciver (NJDEP), dated September 23, 2002.
2. Letter 2130-02-20289, Harkness (AmerGen) to Hoffman (NJDEP), dated October 4, 2002.
3. Letter 2130-02-20299, DeGregorio (AmerGen) to NJ Assistant Director of Water and Hazardous Waste Enforcement, dated October 21, 2002.
4. Letter, Jackson (NJDEP) to DeGregorio, dated December 11, 2002.

# Figure 1

## Oyster Creek Generating Station Water and Air Temperatures - 23Sep2002



**Figure 2**  
**Oyster Creek Generating Station**  
**Water and Air Temperatures**  
**22Sep2002 Through 26Sep2002**



**Table 1**

**FISH COLLECTED AND MEASURED FROM THE SEPTEMBER 2002 OYSTER CREEK FISH KILL EVENT**

Species of Dead/Stressed Fish and Invertebrates Collected	Species Common Name	Total Count Per Species	Percentage of Total (%)	Minimum Length (mm)	Maximum Length (mm)
<i>Morone saxatilis</i>	Striped bass	2720	46.29%	230	960
<i>Brevoortia tyrannus</i>	Atlantic menhaden	999	17.00%	110	165
<i>Morone americanus</i>	White perch	664	11.30%	130	285
<i>Leiostomus xanthurus</i>	Spot	315	5.36%	unknown	162
<i>Anguilla rostrata</i>	American eel	287	4.88%	232	720
<i>Opsanus tau</i>	Oyster toadfish	254	4.32%	162	246
<i>Micropogonias undulatus</i>	Atlantic croaker	230	3.91%	191	195
<i>Dorosoma cepedianum</i>	Gizzard shad	130	2.21%	350	424
<i>Pomatomus saltatrix</i>	Bluefish	112	1.91%	412	895
<i>Libinia emarginata</i>	Spider crab	69	1.17%	unknown	unknown
<i>Pogonias cromis</i>	Black drum	30	0.51%	unknown	520
<i>Callinectes sapidus</i>	Blue crab	22	0.37%	unknown	unknown
N/A	Unidentified	16	0.27%	unknown	unknown
<i>Cynoscion regalis</i>	Weakfish	9	0.15%	unknown	603
<i>Fundulus heteroclitus</i>	Mummichog	4	0.07%	33	56
<i>Trinectes maculatus</i>	Hogchoker	4	0.07%	109	179
Scaridae (?)	Parrotfish (?)	2	0.03%	unknown	unknown
<i>Scaenops ocellatus</i>	Red drum	2	0.03%	481	1150
<i>Dasyatis sabina</i>	Atlantic stingray	2	0.03%	unknown	446
<i>Strongylura marina</i>	Atlantic needlefish	1	0.02%	293	293
<i>Menidia menidia</i>	Atlantic silverside	1	0.02%	87	87
<i>Sphoeroides maculatus</i>	Northern puffer	1	0.02%	238	238
<i>Mugil cephalus</i>	Striped mullet	1	0.02%	450	450
<i>Paralichthys dentatus</i>	Summer flounder	1	0.02%	300	300

Total	5876	100.00%
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**ENCLOSURE I**  
**ATTACHMENT II**

DOCKET 50-219

**SEA TURTLE INCIDENTAL CAPTURE REPORT 2002 - 1**

## OYSTER CREEK GENERATING STATION

### Sea Turtle Incidental Capture Report 2002-1

At approximately 0200 hours on Saturday, June 29, 2002, an Oyster Creek Generating Station operator performing a routine inspection of the trash rakes noticed a sea turtle swimming freely in Bay No. 5 and Bay No. 6 of the circulating water intake structure. The turtle was carefully dip-netted from Bay No. 6 as quickly as possible and was found to be apparently healthy and moving about normally. OCGS Environmental personnel who took custody of the turtle confirmed it to be a juvenile Kemp's ridley sea turtle (Lepidochelys kempi). The water temperature at the time of the incidental capture was approximately 79.2 °F (26.2 °C). OCGS was at full power with four circulating water pumps and two dilution pumps in operation. Although it is impossible to say precisely how long the turtle had been in the vicinity of the intake structure, the circulating water trash rakes had been cleaned at approximately 2200 hours on Friday, June 28, 2002, approximately four hours prior to the turtle's capture. The turtle was not observed during the 2200 cleaning.

The turtle measured 10.0 inches (25.4 cm) carapace length and 9.5 inches (24.1 cm) carapace width straight line. The sex of the turtle was not determined. A scar was visible on the right side of the carapace. No tags were observed on the animal. USNRC and National Marine Fisheries Service personnel were notified of the capture within 24 hours, on June 29, 2002.

The turtle was taken to the MMSC in Brigantine NJ at approximately 0455 hours on June 29, 2002. At the MMSC, the turtle was examined and fed. The wound on the carapace was determined not to be a significant concern. The turtle was held at the MMSC until it was found dead in the pen. A necropsy was performed. All tissue surrounding the cracked area were necrotic.

**ENCLOSURE I**  
**ATTACHMENT II**

DOCKET 50-219

**SEA TURTLE INCIDENTAL CAPTURE REPORT 2002 - 1**

## OYSTER CREEK GENERATING STATION

### Sea Turtle Incidental Capture Report 2002-1

At approximately 0200 hours on Saturday, June 29, 2002, an Oyster Creek Generating Station operator performing a routine inspection of the trash rakes noticed a sea turtle swimming freely in Bay No. 5 and Bay No. 6 of the circulating water intake structure. The turtle was carefully dip-netted from Bay No. 6 as quickly as possible and was found to be apparently healthy and moving about normally. OCGS Environmental personnel who took custody of the turtle confirmed it to be a juvenile Kemp's ridley sea turtle (Lepidochelys kempfi). The water temperature at the time of the incidental capture was approximately 79.2 °F (26.2 °C). OCGS was at full power with four circulating water pumps and two dilution pumps in operation. Although it is impossible to say precisely how long the turtle had been in the vicinity of the intake structure, the circulating water trash rakes had been cleaned at approximately 2200 hours on Friday, June 28, 2002, approximately four hours prior to the turtle's capture. The turtle was not observed during the 2200 cleaning.

The turtle measured 10.0 inches (25.4 cm) carapace length and 9.5 inches (24.1 cm) carapace width straight line. The sex of the turtle was not determined. A scar was visible on the right side of the carapace. No tags were observed on the animal. USNRC and National Marine Fisheries Service personnel were notified of the capture within 24 hours, on June 29, 2002.

The turtle was taken to the MMSC in Brigantine NJ at approximately 0455 hours on June 29, 2002. At the MMSC, the turtle was examined and fed. The wound on the carapace was determined not to be a significant concern. The turtle was held at the MMSC until it was found dead in the pen. A necropsy was performed. All tissue surrounding the cracked area were necrotic.

# SEA TURTLE STRANDING AND SALVAGE NETWORK - STRANDING REPORT

PLEASE PRINT CLEARLY AND FILL IN ALL APPLICABLE BLANKS. Use codes below. Measurements may be straight line (caliper) and/or over the curve (tape measure). Measure length from the center of the nuchal notch to the tip of the most posterior marginal. Measure width at the widest point of carapace. CIRCLE THE UNITS USED. See diagram below. Please give a specific location description. INCLUDE LATITUDE AND LONGITUDE.

Observer's Full Name MARINE MAMMAL STRANDING CENTER Stranding Date 02 - 06 - 29

Address / Affiliation Brigantine, N.J.

Area Code / Phone Number 609-266-0538

Species LK Turtle Number By Day 02-055

Reliability of I.D.: (CIRCLE) Positive Unsure Probable Species Verified by State Coordinator? Yes  No

Sex: (CIRCLE) Female Male Undetermined How was sex determined? necropsy

State NE? JERSEY County Ocean

Location (be specific and include closest town) Forked River, on the intake pipe at Oyster Creek Nuclear Power Plant

Latitude 39° 48' 56.3" N Longitude 74° 12' 25.8" W

Condition of Turtle (use codes) 0 Final Disposition of Turtle (use codes) 7

Tag Number(s) (include tag return address and disposition of tag) \_\_\_\_\_

Remarks (note if turtle was involved with tar or oil, gear or debris entanglement, wounds or mutilations, propellor damage, papillomas, epizoa, etc.) continue on back if necessary

Turtle had a crack on the dorsal right side of its carapace. It was eating on its own, and appeared to be swimming well. It was found dead in the ppen, and necropsy was performed (over) Field # 02-055

**MEASUREMENTS: CIRCLE UNITS**

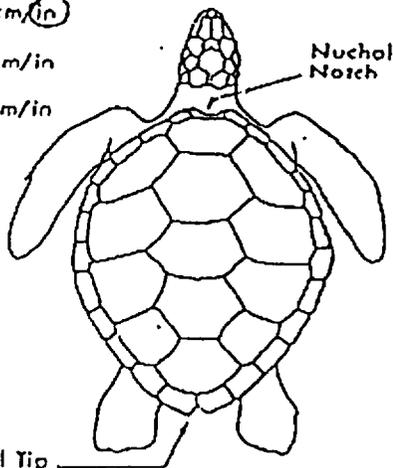
Straight Length 10.5 (est) cm/in

Straight Width 9.75 (est) cm/in

Curved Length \_\_\_\_\_ cm/in

Curved Width \_\_\_\_\_ cm/in

Mark wounds, abnormalities, and tag locations



**CODES:**

- SPECIES:**  
 CC = Loggerhead  
 CM = Green  
 DC = Leatherback  
 EI = Hawksbill  
 LK = Kemp's ridley  
 UN = Unidentified

**CONDITION OF TURTLE:**

- 0 = Alive
- 1 = Fresh dead
- 2 = Moderately decomposed
- 3 = Severely decomposed
- 4 = Dried carcass
- 5 = Skeleton, bones only

**FINAL DISPOSITION OF TURTLE:**

- 1 = Painted, left on beach
- 2 = Buried: on beach / off beach
- 3 = Salvaged specimen: all / part
- 4 = Pulled up on beach or dune
- 5 = Unpainted, left on beach
- 6 = Alive, released
- 7 = Alive, taken to a holding facility

SEP-17-02 TUE 2:24 PM MARINE MAMMAL STR CTR

FAX NO. 6092666300

2002-1  
P. 3

All tissues surrounding the cracked area were necrotic.

**ENCLOSURE I**  
**ATTACHMENT III**

DOCKET 50-219

**SEA TURTLE INCIDENTAL CAPTURE REPORT 2002-2**

## OYSTER CREEK GENERATING STATION

### Sea Turtle Incidental Capture Report 2002-2

At approximately 0755 hours on Wednesday, July 3, 2002, an Oyster Creek Generating Station operator performing a routine inspection of the trash rakes noticed a sea turtle swimming freely in Bay No. 5 of the circulating water intake structure. The turtle was carefully dip-netted from Bay No. 5 as quickly as possible and was found to be apparently healthy and moving about normally. OCGS Environmental personnel who took custody of the turtle confirmed it to be a juvenile Kemp's ridley sea turtle (*Lepidochelys kempii*). The water temperature at the time of the incidental capture was approximately 82.8 °F (28.2 °C). OCGS was at full power with four circulating water pumps and two dilution pumps in operation. Although it is impossible to say precisely how long the turtle had been in the vicinity of the intake structure, the circulating water trash rakes had been cleaned at approximately 0500 hours, approximately three hours prior to the turtle's capture. The turtle was not observed during the 0500 cleaning.

The turtle measured 14.0 inches (35.6 cm) carapace length straight line and weighed 13.3 lb (6.0 kg). The sex of the turtle was not determined. A small scrape less than 1 cm long was observed on one of dorsal scutes of the carapace. No tags were observed on the animal. USNRC and National Marine Fisheries Service personnel were notified of the capture within 24 hours, on July 3, 2002.

The turtle was taken to the MMSC in Brigantine NJ at approximately 1015 hours on July 3, 2002. At the MMSC, the turtle was examined and fed. The scrape on the carapace was determined not to be a significant concern. The turtle was held at the MMSC before tagging and releasing into the near-shore waters around Brigantine on July 9, 2002.