

PROGRESS REPORT
FOR THE THIRTY-SECOND QUARTER

on

STUDY OF WOODBORER POPULATIONS
IN RELATION TO THE
OYSTER CREEK GENERATING STATION

to

GPU NUCLEAR CORPORATION

May 31, 1983

by

R.E. Hillman and C.I. Belmore

REPORT NO. 15183

January 21, 1983 to April 20, 1983

BATTELLE
New England Marine Research Laboratory
Duxbury, Massachusetts 02332

8306090235 830531
PDR ADOCK 05000219
R PDR



GPU Nuclear

P.O. Box 388
Forked River, New Jersey 08731
609-693-6000
Writer's Direct Dial Number:

June 1, 1983

Regional Administrator
Region I
U. S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

Dear Sir:

Subject: Oyster Creek Nuclear Generating Station
Docket No. 50-219
Thirty-Second Quarterly Report

In accordance with Section 3.1 of the Oyster Creek Environmental Technical Specifications, GPU Nuclear submits two copies of the subject report on the "Study of Woodborer Populations in Relation to the Oyster Creek Generating Station" by R. E. Hillman and C. I. Belmore. This report covers the period from January 21, 1983 to April 20, 1983.

If you have any questions, or require additional information please do not hesitate to contact Mr. Douglas Moore of our Licensing and Regulatory Affairs Department at (609) 971-4630.

Very truly yours,

Peter B. Fiedler
Vice President and Director
Oyster Creek

PBF:jal
Enclosure

cc: Director (17 copies)
Office of Nuclear Reactor Regulations
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555
C/o Distribution Services Branch, DDC. ADM

N. J. Bureau of Radiation Protection
Attention: Chief
Division of Environmental Quality
United Sierra Building
380 Scotch Road
West Trenton, NJ 08625

IE23
11

TABLE OF CONTENTS

| | <u>Page</u> |
|---|-------------|
| EXECUTIVE SUMMARY | 1 |
| INTRODUCTION | 2 |
| PROCEDURES AND INTERIM DATA | 3 |
| Exposure Panels | 3 |
| Water Quality | 3 |
| Teredinid Gonadal Development Studies | 3 |

LIST OF TABLES

| | | |
|----------|--|----|
| Table 1. | Geographical Locations of Exposure Panel Arrays in Barnegat Bay, New Jersey | 5 |
| Table 2. | Incidence of Teredinidae in Panels Removed February 8-9, 1983 | 8 |
| Table 3. | Incidence of Teredinidae in Panels Removed March 7-8, 1983 | 9 |
| Table 4. | Incidence of Teredinidae in Panels Removed April 5-6, 1983 | 10 |
| Table 5. | Incidence of <u>Limnoria</u> in Panels Removed February, March, and April, 1983 | 11 |
| Table 6. | Water Quality at Exposure Panel Stations, February 8-9, 1983 | 12 |
| Table 7. | Water Quality at Exposure Panel Stations, March 7-8, 1983 | 13 |
| Table 8. | Water Quality at Exposure Panel Stations, April 5-6, 1983 | 14 |
| Table 9. | Condition of Gonads of Teredinid Borers Removed from Exposure Panels in Barnegat Bay from January through March, 1983 | 15 |

LIST OF FIGURES

| | | |
|-----------|---|---|
| Figure 1. | Outline of Barnegat Bay Showing Geographical Locations of Exposure Panels | 4 |
|-----------|---|---|

Executive Summary

This progress report presents data from field and laboratory work during the period January 21, 1983 to April 20, 1983.

All field work during this quarter was carried out by GPU personnel. Temperature, salinity, dissolved oxygen and pH were measured and recorded at each of the 20 stations during the three periods of exposure panel exchange.

The long-term exposure panel was missing from the exposure rack at Station 1 in February, 1983.

Teredinidae were found in 10 of the 20 long-term exposure panels examined in April, 1983. The majority of these borers were less than 1 mm. There appears to have been a release of larvae in October throughout much of Barnegat Bay. Very few of these specimens were able to survive and grow, since the largest tube observed was 10 mm.

The Limnoria attack has increased slightly in 1983 as compared to 1982, with Limnoria recorded at three locations in March and at four locations in April. None were recorded in the exposure panels removed last year in April and only at one station in March, 1982.

The results of observations on the gonadal development status of shipworms recovered from January through March are reported. Most specimens collected in January were in the spent phase. Development usually begins in the mid-winter, and the number of early active gonads increased through February into March, although most specimens were still in the spent phase.

**PROGRESS REPORT
FOR THE THIRTY-SECOND QUARTER**

on

**STUDY OF WOODBORER POPULATIONS
IN RELATION TO THE
OYSTER CREEK GENERATING STATION**

to

GPU NUCLEAR CORPORATION

May 31, 1983

by

Robert E. Hillman and C.I. Belmore

REPORT NO. 15183

January 21, 1983 to April 20, 1983

from

BATTELLE

**New England Marine Research Laboratory
Duxbury, Massachusetts 02332**

INTRODUCTION

Battelle's New England Marine Research Laboratory is conducting an investigation to determine whether the generating station is affecting the resident marine borer population in Oyster Creek to the extent that that population is contributing significantly to marine borer-caused damage in Barnegat Bay.

A description of the program and procedures used may be found in the sixth annual report titled, "Study of Woodborer Populations in Relation to the Oyster Creek Generating Station," dated March 15, 1982.

This report presents data for the thirty-second quarterly period from January 21, 1983 to April 20, 1983.

PROCEDURES AND INTERIM DATA

Exposure Panels

The long-term and short-term exposure panels were retrieved and replaced with new untreated pre-soaked (for two weeks) panels at the 20 exposure sites in Barnegat Bay and adjacent waters (Figure 1) during the periods February 8-9, March 7-8, and April 5-6, 1983. Long-term and short-term panels at all stations were retrieved and replaced by personnel from GPU's Oyster Creek Nuclear Generating Station. The long-term exposure panel was missing from the exposure rack at Station 1 in February, 1983. Replacement was made as scheduled.

Table 1 describes the geographical locations of the exposure sites. The data for the laboratory examination of the panels are presented in Tables 2 through 5.

Water Quality

Salinity, water temperature, dissolved oxygen and pH were taken at each site by the GPU field team. The results for February, March, and April, 1983 are presented in Tables 6 through 8.

Teredinid Gonadal Development Studies

Table 9 shows the gonad condition of the teredinid borers collected in January, February, and March, 1983. Included are results from panels exposed for periods ranging from 6 to 12 months.

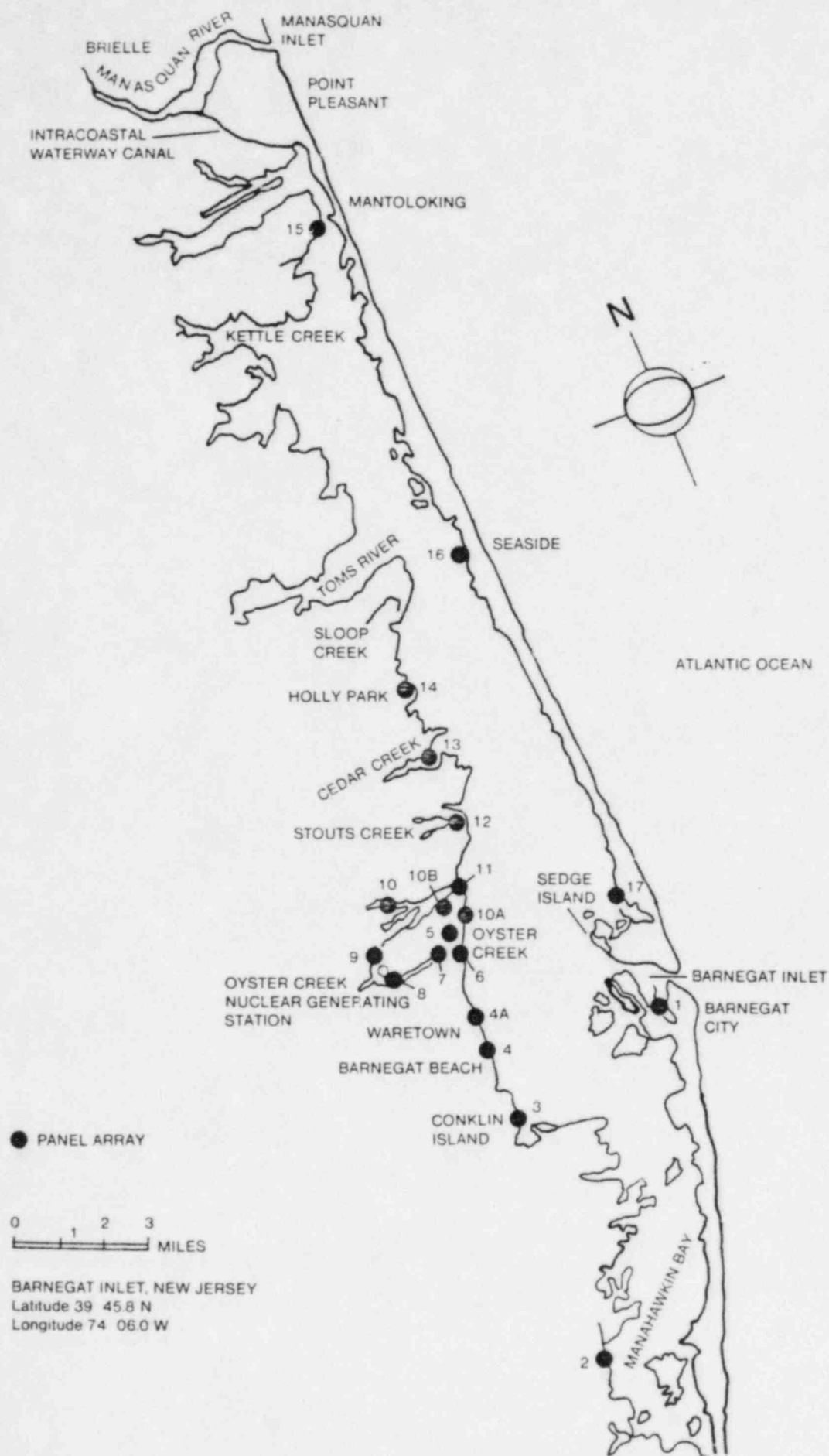


FIGURE 1. OUTLINE OF BARNEGAT BAY SHOWING GEOGRAPHIC LOCATIONS OF EXPOSURE PANELS

TABLE 1. GEOGRAPHICAL LOCATIONS OF BATTELLE NEW ENGLAND MARINE RESEARCH
LABORATORY'S EXPOSURE PANEL ARRAYS IN BARNEGAT BAY, NEW JERSEY

| Site No. | Site | Structure to be used for Suspension of Rack | Nearest Previous Data Stations | Approximate Latitude and Longitude |
|----------|---|--|-------------------------------------|---------------------------------------|
| 1. | Barnegat Coast Guard Station, Barnegat Inlet | Finger Pier | WC 1 WFCL 1948-1967 | Lat. 39° 45.8'N Long. 74° 06.5'W |
| 2. | Ashton Marina 1450 Bay Ave. Manahawkin | Bulkhead | WC 13,14 | Lat. 39° 40'N Long. 74° 13'W |
| 3. | Iggie's Marina East Bay Ave. Barnegat (Conklin Island) | Bulkhead | WC 16,17,18,19 | Lat. 39° 45'N Long. 74° 12.5'W |
| 4. | Liberty Harbor Marina Washington Ave. Waretown | Bulkhead | WC 21 R. Turner Rutgers U. | Lat. 39° 47'N Long. 74° 11'W |
| 4-A*. | Holiday Harbor Marina Lighthouse Drive Waretown | Bulkhead | WC 21 R. Turner Rutgers U. | Lat. 39° 48'N Long. 74° 11'N |
| 5. | Mouth of Oyster Creek, Lot 4, Compass Road Offshore End | Dock | WC 29,30 Rutgers U. | Lat. 39° 48.5'N Long. 74° 10.3'W |
| 6. | Oyster Creek #1 Lagoon, Inshore End 37 Capstan Drive | Dock | | Lat. 39° 48.5'N Long. 74° 10.35'W |
| 7. | Private Dock Dock Ave. Oyster Creek Sands Pt. Harbor Waretown | End of Dock | WC 27,28 R. Turner Rutgers U. | Lat. 39° 48.5'N Long. 74° 11.1'W |

TABLE 1. (continued)

| Site No. | Site | Structure to be used for Suspension of Rack | Nearest Previous Data Stations | Approximate Latitude and Longitude |
|----------|---|--|---|---------------------------------------|
| 8. | Oyster Creek-R.R. Bridge Discharge Canal | Cross Member Bridge | WC 26 Rutgers U. | Lat. 39° 48.7'N Long. 74° 12'W |
| 9. | Forked River South Branch Intake Canal | Cross Member R.R. Bridge | WC 31 Rutgers U. | Lat 39° 49.2'N Long. 74° 12.2'W |
| 10. | Teds Marina Bay Ave. Forked River | Pier | WC 33,34 | Lat. 39° 50.1'N Long. 74° 11.6'W |
| 10A*. | Private Dock 1217 Aquarius Ct. Forked River | Under Dock | | Lat. 39° 49'N Long. 74° 10'W |
| 10B*. | Private Dock 1307 Beach Blvd. Forked River | Under Dock | | Lat. 39° 49.4'N Long. 74° 10.1'W |
| 11. | Forked River (near mouth) 1413 River View Drive | Bulkhead | WC 35 Rutgers U. | Lat. 39° 49.7'N Long. 74° 10'W |
| 12. | Stouts Creek 1273 Capstan Drive | Bulkhead | WC 38,40,41 R. Turner Wurtz Rutgers U. | Lat 39° 50.5'N Long. 74° 08.8'W |
| 13. | Rocknak's Yacht Basin Seaview Ave. Lanoka Harbor Cedar Creek | End of Pier | WC 46 | Lat. 39° 52'N Long. 74° 09'W |

TABLE 1. (continued)

| Site No. | Site | Structure to be used for Suspension of Rack | Nearest Previous Data Stations | Approximate Latitude and Longitude |
|----------|--|--|-----------------------------------|---------------------------------------|
| 14. | Dicks Landing Island Drive Bayville (Holly Park) | Pier | WC 49 R. Turner Nelson | Lat. 39° 54'W Long. 74° 08.1'W |
| 15. | Winter Yacht Basin Inc. Rt. 528 Mantoloking Bridge | Pier | WC 57 | Lat. 40° 02.5'N Long. 74° 03.5'W |
| 16. | Berkely Yacht Basin J. Street Seaside | Pier | WC 60, 61 | Lat. 39° 55.9'N Long. 74° 04.9'W |
| 16A* | Municipal Dock Seaside Heights | Pier | WC 60, 61 | Lat. 39° 56.6'N Long. 74° 04.9'W |
| 16B* | Bayside Boats State Highway #35 and Bay Boulevard Seaside Heights, NJ | Pier | WC 60, 61 | Lat. 39° 56.6'N Long. 74° 04.9'W |
| 17. | Island Beach State Park (Sedge Island) | Pier | WC 68 | Lat. 39° 47.1'N Long. 74° 05.9'W |

All exposure panel racks suspended in a minimum water depth at mean low water of at least three feet. Racks hung with nylon line from existing structures so the bottom panels are close to, but not touching the bottom. Racks at Forked River railroad bridge and Oyster Creek railroad bridge suspended with wire rope.

WC = Woodward-Clyde

WFCL = William F. Clapp Laboratories

* Site 4-A installed April, 1977.

Sites 10A, 10B installed April, 1978.

Site 16 discontinued November, 1981.

Site 16A installed December, 1981 - discontinued June, 1982.

Site 16B installed June, 1982.

TABLE 2. INCIDENCE OF TEREDINIDAE IN PANELS REMOVED FEBRUARY 8-9, 1983

| Station | Panel | No. of Specimens | Percent Filled | Size Range in mm. | Species Identification | Remarks |
|---------|-------|------------------|----------------|-------------------|---|---------|
| 5 | P | 1 | <1 | <1 | 1 Teredinidae* | |
| | C | 0 | | | | |
| 7 | P | 16 | <1 | <1-1 | 16 Teredinidae* | |
| | C | 0 | | | | |
| 11 | P | 10 | 7 | <1-155 | 4 <u>T. navalis</u> , 6 Teredinidae* | |
| | C | 0 | | | | |
| 15 | P | 4 | <1 | <1-1 | 4 Teredinidae* | |
| | C | 0 | | | | |
| 17 | P | 27 | 10 | 10-75 | 27 <u>T. navalis</u> | |
| | C | 0 | | | | |

Stations 2-4A, 6, 8-10B, 12-14, and 16B - No Teredinidae present.
 Station 1 - Long-term exposure panel missing from rack.

P = Long-term panel submerged August 3-4, 1982.
 C = Short-term panel submerged January 3-4, 1983.
 * = Not speciated due to size.

TABLE 3. INCIDENCE OF TEREDINIDAE IN PANELS REMOVED MARCH 7-8, 1983

| Station | Panel | No. of Specimens | Percent Filled | Size Range in mm. | Species Identification | Remarks |
|---------|-------|------------------|----------------|-------------------|---|---------|
| 1 | P | 68 | 1 | <1-5 | 68 Teredinidae* | |
| | C | 0 | | | | |
| 7 | P | 4 | <1 | <1-24 | 1 <i>T. navalis</i> , 3 Teredinidae* | |
| | C | 0 | | | | |
| 11 | P | 10 | <1 | <1-1 | 10 Teredinidae* | |
| | C | 0 | | | | |

Stations 2-6, 8-10B, 12-17 - No Teredinidae present.

P = Long-term panel submerged September 7-8, 1982.

C = Short-term panel submerged February 8-9, 1983.

* = Not speciated due to size.

TABLE 4. INCIDENCE OF TEREDINIDAE IN PANELS REMOVED APRIL 5-6, 1983

| Station | Panel | No. of Specimens | Percent Filled | Size Range in mm. | Species Identification | Remarks |
|---------|-------|------------------|----------------|-------------------|--|------------|
| 1 | P | 327 | <1 | <1-8 | 10 <i>T. navalis</i> , 5 <i>Teredo</i> spp., 312 <i>Teredinidae</i> * | |
| | C | 0 | | | | |
| 4 | P | 2 | <1 | <1 | 2 <i>Teredinidae</i> * | empty pits |
| | C | 0 | | | | |
| 5 | P | 4 | <1 | 1-10 | 2 <i>T. navalis</i> , 1 <i>Teredo</i> spp., 1 <i>Teredinidae</i> * | |
| | C | 0 | | | | |
| 7 | P | 84 | <1 | <1-2 | 17 <i>Teredo</i> , spp., 67 <i>Teredinidae</i> * | |
| | C | 0 | | | | |
| 8 | P | 3 | <1 | <1 | 3 <i>Teredinidae</i> * | |
| | C | 0 | | | | |
| 9 | P | 1 | <1 | <1 | 1 <i>Teredinidae</i> * | empty pit |
| | C | 0 | | | | |
| 10A | P | 3 | <1 | <1 | 3 <i>Teredinidae</i> * | |
| | C | 0 | | | | |
| 11 | P | 45 | <1 | <1-1 | 45 <i>Teredinidae</i> * | |
| | C | 0 | | | | |
| 13 | P | 2 | <1 | <1 | 2 <i>Teredinidae</i> * | |
| | C | 0 | | | | |
| 17 | P | 4 | <1 | <1-2 | 4 <i>Teredinidae</i> * | |
| | C | 0 | | | | |

Stations 2-3, 4A, 6, 10, 10B, 12, 14-16B - No *Teredinidae* present.

P = Long-term panel submerged October 5-6, 1982.

C = Short-term panel submerged March 7-8, 1983.

* = Not speciated due to size.

TABLE 5. INCIDENCE OF LIMNORIA IN PANELS REMOVED FEBRUARY, MARCH, AND APRIL, 1983

| Station | Panel | February | | March | | April | |
|---------|-------|-------------------|---------------------|-------------------|---------------------|-------------------|---------------------|
| | | No. of Tunnels | No. of Specimens | No. of Tunnels | No. of Specimens | No. of Tunnels | No. of Specimens |
| 1 | P | Panel Lost | | 6 | 4 | 5 | 3 |
| | C | 0 | | 0 | | 0 | |
| 2 | P | 80 | 86* | 14 | 10 | 5 | 5 |
| | C | 0 | | 0 | | 0 | |
| 3 | P | 1 | 0 | 0 | | 0 | |
| | C | 0 | | 0 | | 0 | |
| 4 | P | 71 | 66* | 0 | | 1 | 0 |
| | C | 0 | | 0 | | 0 | |
| 4A | P | 800 | 700* | 126 | 72 | 27 | 23** |
| | C | 0 | | 0 | | 0 | |

Stations 5 through 17 - No Limnoria present.

P = Long-term panel, submerged 6 months.

C = Short-term panel, submerged 1 month.

* = Juveniles present.

** = Gravid females present.

TABLE 6. WATER QUALITY AT EXPOSURE PANEL STATIONS FEBRUARY, 1983

| Station | Date | Time | Depth in Feet | Salinity o/oo | Temperature (oC) | O ₂ (mg/l) | pH |
|---------|--------|------|---------------|---------------|------------------|-----------------------|-----|
| 1 | 2/8/83 | 1020 | 2.5 | 27.1 | 2.5 | 14.1 | 8.1 |
| 2 | 2/8/83 | 1102 | 1.0 | 22.7 | 1.7 | 13.0 | 8.0 |
| 3 | 2/8/83 | 1145 | 1.0 | 24.9 | 1.9 | 12.2 | 8.1 |
| 4 | 2/8/83 | 1220 | 1.0 | 27.8 | 2.7 | 11.1 | 8.1 |
| 4A | 2/8/83 | 1245 | 1.5 | 27.7 | 3.2 | 10.2 | 8.1 |
| 5 | 2/8/83 | 1345 | 0.5 | 20.9 | 3.8 | 12.0 | 7.7 |
| 6 | 2/8/83 | 1408 | 0.5 | 19.0 | 2.7 | 12.6 | 7.7 |
| 7 | 2/8/83 | 1430 | 0.5 | 22.0 | 3.8 | 12.3 | 7.8 |
| 8 | 2/8/83 | 1507 | 2.5 | 21.7 | 3.5 | 13.3 | 7.9 |
| 9 | 2/8/83 | 1530 | 2.5 | 23.3 | 1.9 | 13.9 | 8.0 |
| 10 | 2/8/83 | 1710 | 2.5 | 16.9 | 1.8 | 13.2 | 7.7 |
| 10A | 2/8/83 | 1558 | 0.8 | 23.5 | 1.8 | 14.1 | 8.1 |
| 10B | 2/8/83 | 1617 | 2.5 | 23.5 | 1.6 | 14.2 | 8.0 |
| 11 | 2/8/83 | 1638 | 1.0 | 23.9 | 1.6 | 13.5 | 8.0 |
| 12 | 2/9/83 | 1232 | 1.5 | 19.2 | 1.2 | 12.8 | 7.7 |
| 13 | 2/9/83 | 1201 | 1.5 | 12.9 | 1.7 | 12.8 | 7.5 |
| 14 | 2/9/83 | 1134 | 1.5 | 20.1 | 1.4 | 13.4 | 7.9 |
| 15 | 2/9/83 | 0912 | 2.0 | 22.1 | 0.3 | 14.5 | 8.1 |
| 16B | 2/9/83 | 0945 | 3.0 | 18.7 | -0.2 | 14.9 | 7.9 |
| 17 | 2/9/83 | 1028 | 0.5 | 25.8 | -0.8 | 14.9 | 7.9 |

TABLE 7. WATER QUALITY AT EXPOSURE PANEL STATIONS MARCH, 1983

| Station | Date | Time | Depth in Feet | Salinity o/oo | Temperature (oC) | O ₂ (mg/l) | pH |
|---------|--------|------|---------------|---------------|------------------|-----------------------|-----|
| 1 | 3/7/83 | 1025 | 3.5 | 24.8 | 6.7 | 10.6 | 7.8 |
| 2 | 3/7/83 | 1105 | 3.5 | 20.6 | 9.1 | 9.8 | 7.8 |
| 3 | 3/7/83 | 1150 | 0.8 | 18.7 | 8.9 | 10.3 | 7.6 |
| 4 | 3/7/83 | 1225 | 2.5 | 19.8 | 7.6 | 9.0 | 7.8 |
| 4A | 3/7/83 | 1250 | 0.8 | 19.9 | 7.2 | 9.9 | 7.9 |
| 5 | 3/7/83 | 1345 | 0.5 | 17.3 | 7.3 | 10.4 | 7.5 |
| 6 | 3/7/83 | 1408 | 1.0 | 14.8 | 7.9 | 10.0 | 7.2 |
| 7 | 3/7/83 | 1430 | 1.0 | 16.0 | 7.6 | 10.1 | 7.3 |
| 8 | 3/7/83 | 1500 | 2.5 | 17.9 | 6.8 | 10.2 | 7.7 |
| 9 | 3/7/83 | 1530 | 3.5 | 18.9 | 6.7 | 10.0 | 7.7 |
| 10 | 3/8/83 | 1328 | 2.5 | 16.7 | 6.7 | 8.9 | 7.5 |
| 10A | 3/7/83 | 1605 | 1.0 | 20.0 | 6.8 | 9.9 | 7.3 |
| 10B | 3/7/83 | 1628 | 2.0 | 21.0 | 6.7 | 9.8 | 7.8 |
| 11 | 3/7/83 | 1645 | 1.0 | 19.9 | 6.7 | 9.6 | 8.1 |
| 12 | 3/8/83 | 1300 | 2.0 | 17.6 | 6.0 | 9.8 | 7.8 |
| 13 | 3/8/83 | 1231 | 2.5 | 5.8 | 5.9 | 9.8 | 7.4 |
| 14 | 3/8/83 | 1208 | 2.5 | 15.0 | 5.6 | 10.2 | 7.9 |
| 15 | 3/8/83 | 0930 | 2.0 | 20.2 | 5.6 | 10.2 | 8.1 |
| 16B | 3/8/83 | 1010 | 3.5 | 19.1 | 5.7 | 10.3 | 8.0 |
| 17 | 3/8/83 | 1100 | 0.8 | 21.2 | 5.7 | 10.3 | 8.1 |

TABLE 8. WATER QUALITY AT EXPOSURE PANEL STATIONS APRIL, 1983

| Station | Date | Time | Depth in Feet | Salinity o/oo | Temperature (oC) | O ₂ (mg/l) | pH |
|---------|--------|------|---------------|---------------|------------------|-----------------------|-----|
| 1 | 4/5/83 | 0920 | 4.5 | 22.8 | 10.0 | 10.2 | 8.4 |
| 2 | 4/5/83 | 0955 | 0.5 | 21.8 | 10.5 | 9.0 | 8.1 |
| 3 | 4/5/83 | 1030 | 0.8 | 21.0 | 10.7 | 10.6 | 8.4 |
| 4 | 4/5/83 | 1050 | 0.8 | 22.0 | 9.7 | 10.8 | 8.3 |
| 4A | 4/5/83 | 1110 | 0.8 | 21.9 | 9.7 | 10.9 | 8.4 |
| 5 | 4/5/83 | 1130 | 0.5 | 10.9 | 10.2 | 10.3 | 7.3 |
| 6 | 4/5/83 | 1145 | 0.5 | 6.0 | 10.0 | 10.2 | 7.3 |
| 7 | 4/5/83 | 1203 | 0.8 | 15.1 | 10.8 | 10.0 | 7.7 |
| 8 | 4/5/83 | 1408 | 3.5 | 21.5 | 9.2 | 10.0 | 8.4 |
| 9 | 4/5/83 | 1335 | 4.5 | 9.9 | 11.0 | 9.2 | 7.9 |
| 10 | 4/5/83 | 1355 | 2.0 | 18.3 | 11.7 | 10.1 | 8.3 |
| 10A | 4/5/83 | 1430 | 0.8 | 21.0 | 11.5 | 9.6 | 8.5 |
| 10B | 4/5/83 | 1450 | 2.0 | 20.3 | 11.7 | 9.8 | 8.2 |
| 11 | 4/5/83 | 1508 | 0.8 | 15.2 | 12.0 | 9.6 | 8.1 |
| 12 | 4/6/83 | 1233 | 1.5 | 16.0 | 10.8 | 11.2 | 8.2 |
| 13 | 4/6/83 | 1205 | 1.5 | 5.0 | 10.0 | 9.2 | 7.2 |
| 14 | 4/6/83 | 1135 | 2.0 | 13.8 | 10.2 | 11.0 | 8.5 |
| 15 | 4/6/83 | 0917 | 2.5 | 15.1 | 10.0 | 10.8 | 8.4 |
| 16B | 4/6/83 | 0950 | 3.3 | 15.0 | 10.7 | 11.2 | 8.4 |
| 17 | 4/6/83 | 1035 | 0.5 | 20.3 | 11.2 | 9.4 | 8.2 |

TABLE 9. CONDITION OF GONADS OF TEREDINID BORERS REMOVED FROM EXPOSURE PANELS IN BARNEGAT BAY FROM JANUARY THROUGH MARCH, 1983

EA= Early active; LA= Late active; R= Ripe; PS= Partially spawned;
S= Spent; M= Male; F= Female; H= Hermaphrodite

| Specimen No. | Station | Month Removed | No. Months Exposed | Species | Sex | Gonad Condition | Comments |
|--------------|---------|---------------|--------------------|-----------------------|-----|-----------------|----------|
| 1193 | 10 | Jan 83 | 6 | <u>Teredo navalis</u> | F | S | |
| 1194 | 10B | Jan 83 | 6 | <u>Bankia gouldi</u> | M | S | |
| 1195 | 13 | Jan 83 | 6 | <u>Bankia gouldi</u> | M | S | |
| 1196 | 15 | Jan 83 | 6 | <u>Teredo navalis</u> | M | EA | |
| 1197 a | 10A | Jan 83 | 6 | <u>Teredo navalis</u> | F | S | |
| b | | | | <u>Teredo navalis</u> | M | S | |
| 1198 a | 15 | Jan 83 | 6 | <u>Bankia gouldi</u> | M | S | |
| b | | | | <u>Bankia gouldi</u> | M | S | |
| c | | | | <u>Bankia gouldi</u> | M | S | |
| d | | | | <u>Bankia gouldi</u> | M | S | |
| 1199 | 11 | Jan 83 | 6 | <u>Bankia gouldi</u> | M | S | |
| 1200 a | 11 | Jan 83 | 6 | <u>Teredo navalis</u> | M | S | |
| b | | | | <u>Teredo navalis</u> | F | S | |
| c | | | | <u>Teredo navalis</u> | H | EA | |
| d | | | | <u>Teredo navalis</u> | M | S | |
| e | | | | <u>Teredo navalis</u> | H | PS | |
| f | | | | <u>Teredo navalis</u> | H | EA | |
| g | | | | <u>Teredo navalis</u> | M | S | |
| h | | | | <u>Teredo navalis</u> | M | S | |

TABLE 9. (continued)

| Specimen No. | Station | Month Removed | No. Months Exposed | Species | Sex | Gonad Condition | Comments |
|--------------|---------|------------------|-----------------------|-----------------------|-----|--------------------|----------|
| i | | | | <u>Teredo navalis</u> | M | S | |
| j | | | | <u>Teredo navalis</u> | M | S | |
| k | | | | <u>Teredo navalis</u> | M | S | |
| l | | | | <u>Teredo navalis</u> | F | S | |
| m | | | | <u>Teredo navalis</u> | M | EA | |
| n | | | | <u>Teredo navalis</u> | M | S | |
| 1201 a | 3 | Jan 83 | 6 | <u>Bankia gouldi</u> | M | S | |
| b | | | | <u>Bankia gouldi</u> | M | S | |
| 1202 | 12 | Jan 83 | 6 | <u>Bankia gouldi</u> | M | S | |
| 1203 a | 17 | Jan 83 | 6 | <u>Teredo navalis</u> | F | S | |
| b | | | | <u>Teredo navalis</u> | M | EA | |
| c | | | | <u>Teredo navalis</u> | M | S | |
| d | | | | <u>Teredo navalis</u> | H | S | |
| e | | | | <u>Teredo navalis</u> | M | S | |
| f | | | | <u>Teredo navalis</u> | M | S | |
| g | | | | <u>Teredo navalis</u> | M | S | |
| h | | | | <u>Teredo navalis</u> | M | EA | |
| i | | | | <u>Teredo navalis</u> | M | S | |
| j | | | | <u>Teredo navalis</u> | H | H | |
| k | | | | <u>Teredo navalis</u> | M | EA | |
| l | | | | <u>Teredo navalis</u> | H | S | |
| m | | | | <u>Teredo navalis</u> | M | EA | |
| n | | | | <u>Teredo navalis</u> | M | S | |
| o | | | | <u>Teredo navalis</u> | M | S | |
| p | | | | <u>Teredo navalis</u> | M | S | |
| q | | | | <u>Teredo navalis</u> | M | LA | |

TABLE 9. (continued)

| Specimen No. | Station | Month Removed | No. Months Exposed | Species | Sex | Gonad Condition | Comments |
|--------------|---------|------------------|-----------------------|-----------------------|-----|--------------------|--|
| 1204 | 7 | Jan 83 | 6 | <u>Teredo navalis</u> | F | LA | |
| 1205 a | 1 | Jan 83 | 6 | <u>Teredo navalis</u> | F | PS | |
| b | | | | <u>Teredo navalis</u> | M | S | |
| c | | | | <u>Teredo navalis</u> | M | S | |
| d | | | | <u>Teredo navalis</u> | F | R | |
| e | | | | <u>Teredo navalis</u> | F | S | |
| f | | | | <u>Teredo navalis</u> | M | S | |
| g | | | | <u>Teredo navalis</u> | M | LA | |
| h | | | | <u>Teredo navalis</u> | | | |
| i | | | | <u>Teredo navalis</u> | H | S | no discernable gonad |
| j | | | | <u>Teredo navalis</u> | F | PS | |
| k | | | | <u>Teredo navalis</u> | M | S | |
| l | | | | <u>Teredo navalis</u> | M | S | |
| m | | | | <u>Teredo navalis</u> | F | PS | |
| n | | | | <u>Teredo navalis</u> | H | S | |
| o | | | | <u>Teredo navalis</u> | H | S | |
| p | | | | <u>Teredo navalis</u> | H | S | |
| q | | | | <u>Teredo navalis</u> | M | S | |
| r | | | | <u>Teredo navalis</u> | M | S | |
| 1206 a | 11 | Jan 83 | 12 | <u>Bankia gouldi</u> | | | special panel; no discernable gonad |
| b | | | | <u>Bankia gouldi</u> | M | S | |
| 1207 | 7 | Jan 83 | 12 | <u>Teredo navalis</u> | M | EA | special panel |
| 1208 a | 11 | Jan 83 | 12 | <u>Teredo navalis</u> | H | S | special panel |
| b | | | | <u>Teredo navalis</u> | M | S | |
| c | | | | <u>Teredo navalis</u> | M | S | |

TABLE 9. (continued)

| Specimen No. | Station | Month Removed | No. Months Exposed | Species | Sex | Gonad Condition | Comments |
|--------------|---------|------------------|-----------------------|------------------------------|-----|--------------------|----------------------|
| d | | | | <u>Teredo</u> <u>navalis</u> | M | S | |
| e | | | | <u>Teredo</u> <u>navalis</u> | M | S | |
| f | | | | <u>Teredo</u> <u>navalis</u> | H | S | |
| g | | | | <u>Teredo</u> <u>navalis</u> | F | S | |
| h | | | | <u>Teredo</u> <u>navalis</u> | M | S | |
| i | | | | <u>Teredo</u> <u>navalis</u> | M | S | |
| j | | | | <u>Teredo</u> <u>navalis</u> | M | EA | |
| k | | | | <u>Teredo</u> <u>navalis</u> | M | S | |
| l | | | | <u>Teredo</u> <u>navalis</u> | M | S | |
| 1209 a | 17 | Jan 83 | 12 | <u>Teredo</u> <u>navalis</u> | M | EA | special panel |
| b | | | | <u>Teredo</u> <u>navalis</u> | M | EA | |
| c | | | | <u>Teredo</u> <u>navalis</u> | M | EA | |
| d | | | | <u>Teredo</u> <u>navalis</u> | | | no discernable gonad |
| e | | | | <u>Teredo</u> <u>navalis</u> | M | EA | |
| f | | | | <u>Teredo</u> <u>navalis</u> | M | EA | |
| g | | | | <u>Teredo</u> <u>navalis</u> | M | EA | |
| h | | | | <u>Teredo</u> <u>navalis</u> | H | EA | |
| i | | | | <u>Teredo</u> <u>navalis</u> | H | S | |
| j | | | | <u>Teredo</u> <u>navalis</u> | M | S | |
| 1210 a | 17 | Feb 83 | 6 | <u>Teredo</u> <u>navalis</u> | H | S | |
| b | | | | <u>Teredo</u> <u>navalis</u> | H | LA | |
| c | | | | <u>Teredo</u> <u>navalis</u> | M | EA | |
| d | | | | <u>Teredo</u> <u>navalis</u> | M | S | |
| e | | | | <u>Teredo</u> <u>navalis</u> | H | LA | |
| f | | | | <u>Teredo</u> <u>navalis</u> | H | EA | |
| g | | | | <u>Teredo</u> <u>navalis</u> | H | EA | |
| h | | | | <u>Teredo</u> <u>navalis</u> | H | S | |
| i | | | | <u>Teredo</u> <u>navalis</u> | M | EA | |

TABLE 9. (continued)

| Specimen No. | Station | Month Removed | No. Months Exposed | Species | Sex | Gonad Condition | Comments |
|--------------|---------|------------------|-----------------------|------------------------|-----|--------------------|----------------------|
| j | | | | <u>Teredo nautilus</u> | M | S | |
| k | | | | <u>Teredo nautilus</u> | M | S | |
| l | | | | <u>Teredo nautilus</u> | M | S | |
| m | | | | <u>Teredo nautilus</u> | H | S | |
| 1211 a | 11 | Feb 83 | 6 | <u>Teredo nautilus</u> | H | PS | |
| b | | | | <u>Teredo nautilus</u> | H | PS | |
| c | | | | <u>Teredo nautilus</u> | M | S | |
| d | | | | <u>Teredo nautilus</u> | M | S | |
| 1212 | 11 | Feb 83 | 12 | <u>Bankia gouldi</u> | M | S | special panel |
| 1213 a | 11 | Feb 83 | 12 | <u>Teredo nautilus</u> | M | S | special panel |
| b | | | | <u>Teredo nautilus</u> | | | no discernable gonad |
| c | | | | <u>Teredo nautilus</u> | M | EA | |
| d | | | | <u>Teredo nautilus</u> | H | S | |
| e | | | | <u>Teredo nautilus</u> | M | S | |
| f | | | | <u>Teredo nautilus</u> | M | S | |
| g | | | | <u>Teredo nautilus</u> | H | S | |
| h | | | | <u>Teredo nautilus</u> | F | R | |
| i | | | | <u>Teredo nautilus</u> | H | PS | |
| j | | | | <u>Teredo nautilus</u> | M | S | |
| k | | | | <u>Teredo nautilus</u> | H | EA | |
| l | | | | <u>Teredo nautilus</u> | H | S | |
| m | | | | <u>Teredo nautilus</u> | | | no discernable gonad |
| n | | | | <u>Teredo nautilus</u> | M | S | |
| o | | | | <u>Teredo nautilus</u> | | | no discernable gonad |

TABLE 9. (continued)

| Specimen No. | Station | Month Removed | No. Months Exposed | Species | Sex | Gonad Condition | Comments |
|--------------|---------|------------------|-----------------------|------------------------------|-----|--------------------|--|
| 1214 a | 17 | Feb 83 | 12 | <u>Teredo</u> <u>navalis</u> | M | S | special panel |
| b | | | | <u>Teredo</u> <u>navalis</u> | H | S | |
| c | | | | <u>Teredo</u> <u>navalis</u> | H | S | |
| d | | | | <u>Teredo</u> <u>navalis</u> | H | S | no discernable gonad |
| e | | | | <u>Teredo</u> <u>navalis</u> | H | EA | |
| f | | | | <u>Teredo</u> <u>navalis</u> | | | |
| g | | | | <u>Teredo</u> <u>navalis</u> | H | EA | |
| h | | | | <u>Teredo</u> <u>navalis</u> | M | EA | |
| i | | | | <u>Teredo</u> <u>navalis</u> | M | EA | |
| j | | | | <u>Teredo</u> <u>navalis</u> | H | S | |
| k | | | | <u>Teredo</u> <u>navalis</u> | M | EA | |
| l | | | | <u>Teredo</u> <u>navalis</u> | M | EA | |
| 1215 | 7 | Mar 83 | 6 | <u>Teredo</u> <u>navalis</u> | M | EA | |
| 1216 a | 17 | Mar 83 | 12 | <u>Teredo</u> <u>navalis</u> | M | EA | special panel |
| b | | | | <u>Teredo</u> <u>navalis</u> | M | S | |
| c | | | | <u>Teredo</u> <u>navalis</u> | M | S | no discernable gonad |
| d | | | | <u>Teredo</u> <u>navalis</u> | H | S | |
| e | | | | <u>Teredo</u> <u>navalis</u> | | | |
| 1217 | 12 | Mar 83 | 12 | <u>Bankia</u> <u>gouldi</u> | | | Special panel; no discernable gonad |
| 1218 a | 11 | Mar 83 | 12 | <u>Teredo</u> <u>navalis</u> | H | S | special panel |
| b | | | | <u>Teredo</u> <u>navalis</u> | F | S | |
| c | | | | <u>Teredo</u> <u>navalis</u> | F | S | |
| d | | | | <u>Teredo</u> <u>navalis</u> | H | S | |
| e | | | | <u>Teredo</u> <u>navalis</u> | F | PS | |
| f | | | | <u>Teredo</u> <u>navalis</u> | M | EA | |

TABLE 9. (continued)

| Specimen No. | Station | Month Removed | No. Months Exposed | Species | Sex | Gonad Condition | Comments |
|--------------|---------|------------------|-----------------------|------------------------------|-----|--------------------|----------------------|
| g | | | | <u>Teredo</u> <u>navalis</u> | H | S | no discernable gonad |
| h | | | | <u>Teredo</u> <u>navalis</u> | M | S | |
| i | | | | <u>Teredo</u> <u>navalis</u> | | | |
| j | | | | <u>Teredo</u> <u>navalis</u> | M | S | |
| k | | | | <u>Teredo</u> <u>navalis</u> | F | R | |
| l | | | | <u>Teredo</u> <u>navalis</u> | M | S | |
| m | | | | <u>Teredo</u> <u>navalis</u> | M | S | |
| n | | | | <u>Teredo</u> <u>navalis</u> | M | S | |
| o | | | | <u>Teredo</u> <u>navalis</u> | H | S | |
| p | | | | <u>Teredo</u> <u>navalis</u> | M | S | |
| q | | | | <u>Teredo</u> <u>navalis</u> | F | S | |
| r | | | | <u>Teredo</u> <u>navalis</u> | M | S | |
| s | | | | <u>Teredo</u> <u>navalis</u> | M | S | |
| t | | | | <u>Teredo</u> <u>navalis</u> | F | LA | |
| u | | | | <u>Teredo</u> <u>navalis</u> | M | S | |
| v | | | | <u>Teredo</u> <u>navalis</u> | H | S | |
| w | | | | <u>Teredo</u> <u>navalis</u> | F | PS | |