BALTIMORE
GAS AND
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CHARLES CENTER • P.O. BOX 1475 • BALTIMORE, MARYLAND 21203

ELECTRIC ENGINEERING
DEPARTMENT

September 23, 1983

Region 1
USNRC
631 Park Avenue
King of Prussia, PA 19406

Dear Sirs:

According to Appendix B-Part II to Facility Operating License Nos. DPR-53 and DPR-69 Calvert Cliffs Nuclear Power Plant, the Environmental Protection Plan Section 4.1 unusual fish kills are to be reported. Also according to Regulatory Guide 10.1 Appendix A. No. 181 Nonroutine Environmental Operating Report requires notification within thirty days of the event.

On August 31, 1983 Calvert Cliffs Nuclear Power Plant Unit 1 reactor and turbine were manually tripped due to a large impingement episode which clogged travelling screens. A more detailed explanation is given in the attached report to Maryland Office of Environmental Programs.

If you have any questions regarding this report, please call me at 301/234-6533.

Sincerely,

Elizabeth I. Bauereis, Pn.D
Senior Biologist

EIB/few

Attachment

cc: Document Control Desk

A E23
1/1

September 14, 1983

TO: Mr. John Veil
Office of Environmental Programs

FROM: Elizabeth I. Bauereis

SUBJECT: Impingement Episode at Calvert Cliffs Nuclear Power Plant
August 31, 1983

According to the NPDES permit (MD0002399) for Calvert Cliffs Nuclear Power Plant under I Special Conditions, H. Intake Monitoring, any impingement episodes substantial enough to cause modification to plant operations is a reportable event. At 6 a.m. on August 31, 1983 CCNPP Unit 1 reactor and turbine were manually tripped, due to a massive influx of stressed and dying fish clogging the travelling screens. The fish involved were primarily six to eight inch croaker, Micropogon undulatus and some spot Leiostomus xanthurus. The screen wash was not effective in removing the fish and nine fifty gallon drums of fish were removed from Unit 1 waterboxes.

The cause of the distress in the croaker was anoxia. Dissolved oxygen records in the intake embayment show oxygen values of three mg/l. or less 10 p.m. on August 30, 1983 until noon on August 31, 1983. Prolonged periods of low dissolved oxygen are indicative of a rather widespread phenomenon, i.e., extending beyond the intake embayment.

Four curtain wall panels were removed from the intake curtain wall in June. This allows egress for fish when the dissolved oxygen in the embayment is lower than outside the curtain wall. In order for fish to follow a dissolved oxygen gradient to outside the curtain wall, a gradient must exist. We have evidence from earlier studies (1977 and 1978) that the low dissolved oxygen conditions may extend from bottom to surface of the Bay and for a considerable distance above and below the plant. It would appear that a similar condition has occurred particularly since stratification was observed in late May and it has been an unusually hot summer.

Efforts are being made on a long term basis to improve both the screen wash and the operation of the travelling screens. Also if low dissolved oxygen values (< 3 mg/l.) are observed before 11 p.m. or for six hours then travelling screens should be rotated continuously and the screen wash increased if possible.

Elizabeth I. Bauereis
Senior Biologist
Environmental Studies & Monitoring

EIB/few

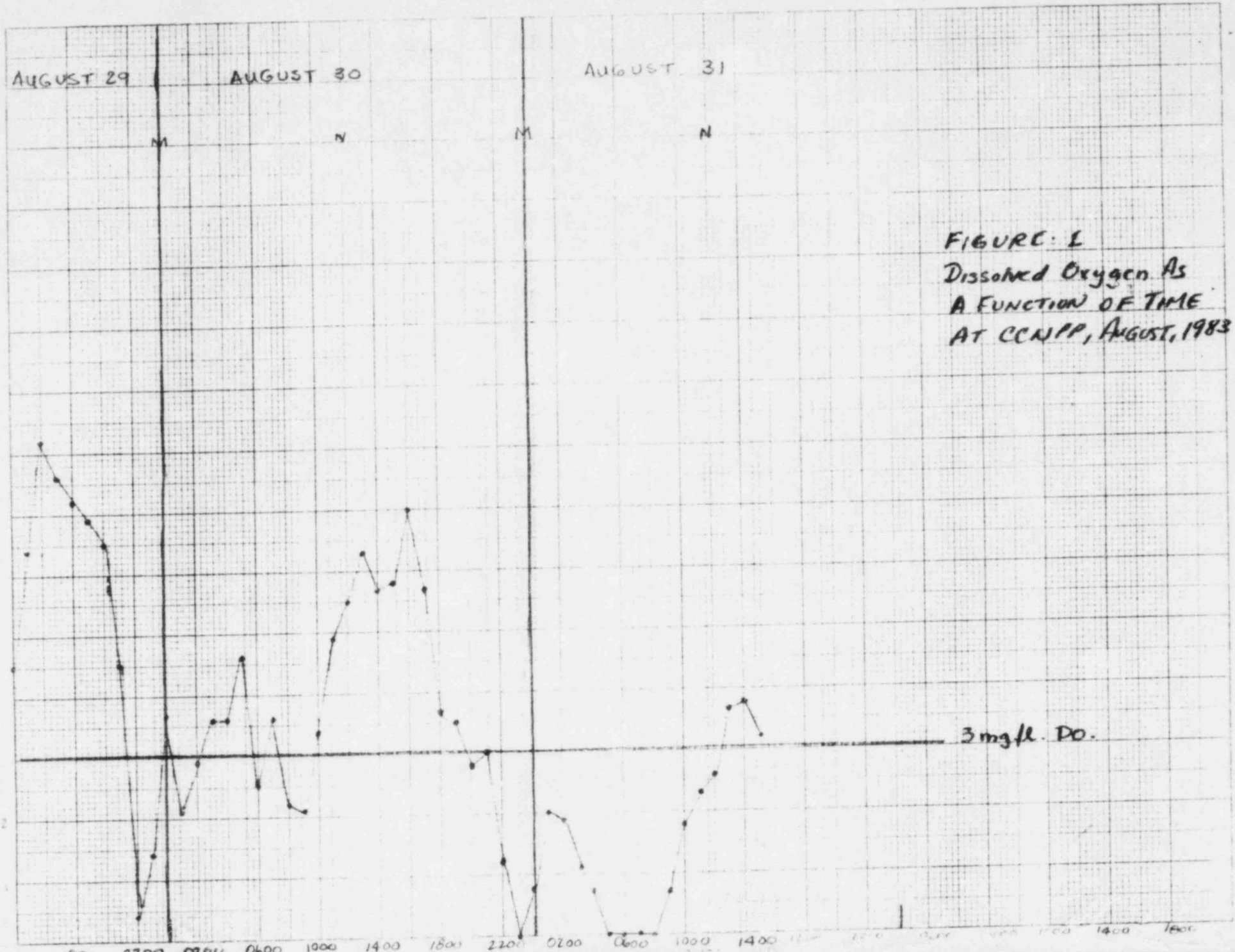
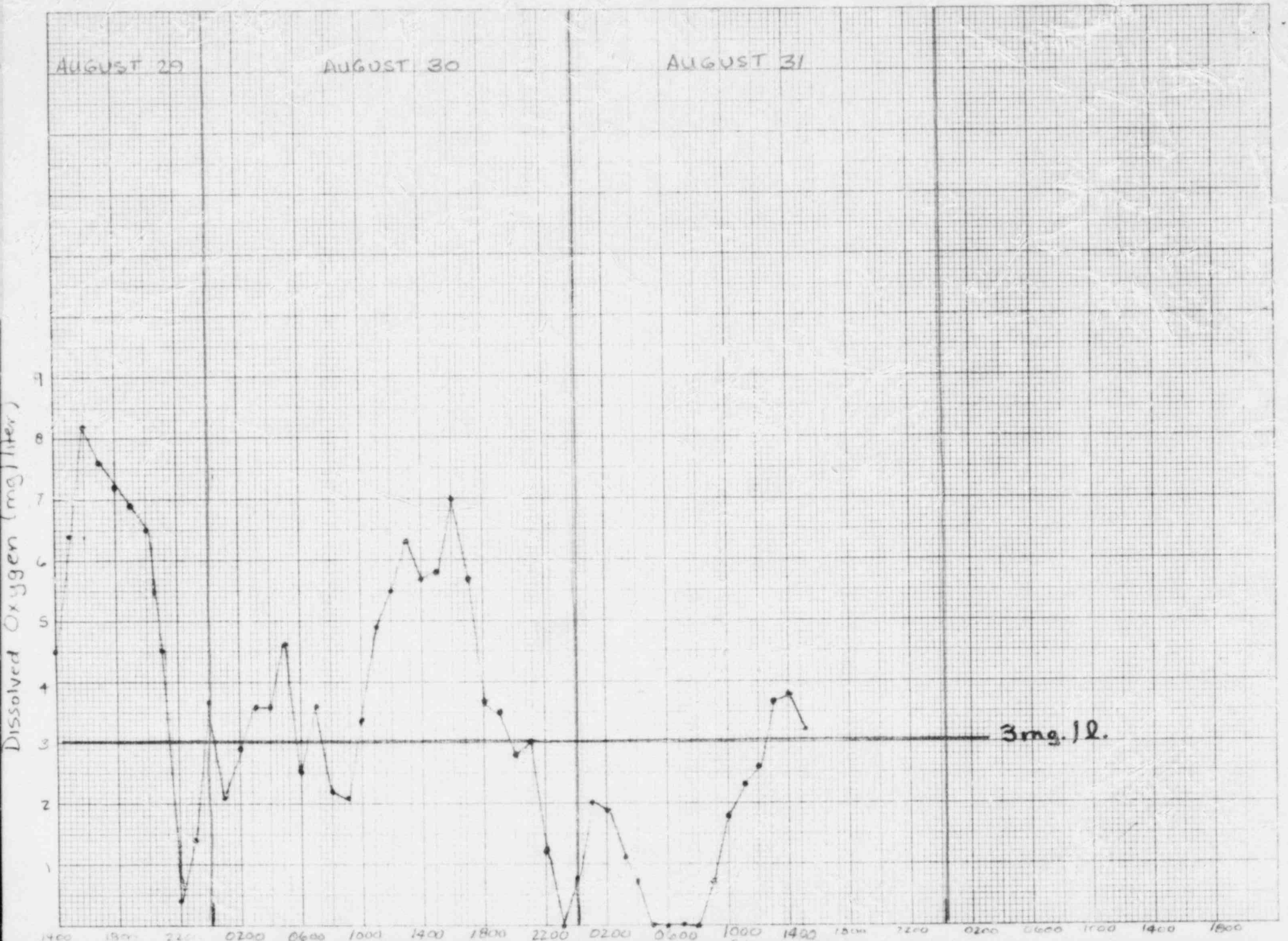


FIGURE: 1
Dissolved Oxygen As
A Function Of Time
At CCNPP, August, 1983



THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA
BENEDICT ESTUARINE RESEARCH LABORATORY
BENEDICT, MARYLAND 20612 • TELEPHONE (301) 274-3134

September 12, 1983

Dr. Elizabeth Bauereis
Baltimore Gas and Electric Co.
P. O. Box 1475, Room 920
Baltimore, MD 21203

Dear Bette:

On 31 August at 11:45 a.m. Jack Lodge called to inform me that Unit 1 at Calvert Cliffs had shut down at 6:00 a.m. that morning due to the impingement of a large number of dead fish. At 12:45 p.m. Bill Yates and I began a series of observations at the plant. Many dead fish were on the bottom below the outfall of Unit 2 screen wash discharge, but no fish were coming out the pipe. Many dead fish were also in the area of the outfall of Unit 1 screen wash discharge, and many (~100/min) were coming out the pipe. Most of these were croaker and spot, but dead flounder, hogchoker, and menhaden were also observed.

Beginning at 12:55 a series of dissolved oxygen (DO), salinity, and temperature profiles was made. Below is a table detailing the results of these profiles, but in summary the DO was 3.0 mg/l or greater in nearly all locations and depths except below 30 ft where it was between 0.15 and 0.3 mg/l.

	DO	Sal	Temp
Curtain Wall (outside)			
Surface	5.0 mg/l	14.6 °/oo	27.9
5'	4.6	14.5	27.5
10'	4.1	15.0	27.8
15'	3.5	15.0	27.4
20'	3.1	15.3	27.2
25'	3.2	15.0	27.2
30'	0.25	20.6	25.4
40'	0.25	22.1	25.5
Curtain Wall (inside)			
Surface	3.0	15.0	27.7
15'	3.2	15.0	27.4
30'	3.5	15.0	27.0
35'	0.3	20.4	26.0
Discharge Terminus	3.2	15.0	30.7
Discharge (1 mi offshore)			
Surface	6.0	14.7	27.8
35'	2.6	14.7	26.3
Intake (1 mi offshore)			
Surface	4.8	14.2	27.5
35'	3.3	15.1	26.4
Intake (1½ mi offshore)			
40'	0.15	15.0	26.8

On 7 September large numbers of dead fish were again seen in the areas of both screen wash outfalls. Several thousand dead croaker were also seen on the surface over a large area extending from about a mile north of the discharge to Flag Harbor at Long Beach. A DO profile at the outside of the curtain wall in front of one of the openings gave the following results:

Depth	DO
10'	2.9 mg/l
15'	2.5
20'	1.6
25'	0.7
30'	0.15

We will continue to monitor conditions at times we are on the Bay, but if there is anything additional that you want us to do or if you have questions concerning any of the enclosed informaton please let us know.

Sincerely,

George Abbe

GA:ja

cc: M. Hirshfield

Large Impingement Episodes - CCNPP

4 September - 0000 - Unit 1 - DO = 1.0 ppm

Croaker - 1640
Spot - 118
Hogchoker - 66
Crab - 58
Other - 22

4 September - 0200 - Unit 2

Total - 15 Fish

5 September - 0400 - Unit 2

Total - 14 Fish

5 September - 0600 - Unit 1 - DO = 1.4 ppm

Croaker - 1955
Spot - 38
Hogchoker - 22
Crab - 9
Other - 83

6 September - 0800 - Unit 1 - DO = 2.1 ppm

Croaker - 6250
Spot - 75
Hogchoker - 4
Crab - 8
Other - 214

6 September - 1000 - Unit 2

Total < 25 Fish

12 September - 0100 - Unit 1 - DO = 1.0 ppm

Croaker - 7980 live
480 dead
Spot - 33
Hogchoker - 22
Crabs - 10
Other - 323

12 September - 0300 - Unit 2

Croaker - 297 live
13 dead
Other < 25

NOTE: Impingement counts on 30 and 31 August (both at night) and on 7 September (noon and 2 p.m.) were unexceptional.