Florida Power
CORPORATION

August 23, 1984
3F0884-15

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72
Environmental Protection Agency 316 Study Information

Dear Sir:

Florida Power Corporation hereby transmits a copy of a letter, submitted to the Environmental Protection Agency, in accordance with Crystal River Unit 3 Technical Specifications, Appendix B, Part II, Section 3.2. The attached letter transmitted the Notes of Conference for the Fourth Quarterly Progress Meeting on the Crystal River 316 Study and corrected salinity figures for the Third Quarterly Report.

If there are any questions concerning this information, please contact this office.

Sincerely,

G. R. Westafer

G. R. Westafer
Manager, Nuclear Operations
Licensing and Fuel Management

DVH/feb

Attachments

cc: Mr. J. P. O'Reilly, Regional Administrator
Office of Inspection & Enforcement, Region II
U.S. Nuclear Regulatory Commission
101 Marietta Street N.W., Suite 2900
Atlanta, GA 30323

A001

Florida Power
CORPORATION

August 21, 1984

Mr. Paul J. Traina
Director, Water Management Division
Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Mr. Traina:

Enclosed is a copy of the Notes of Conference for the Fourth Quarterly Progress Meeting on the Crystal River 316 Study which was held on August 2, 1984. Also enclosed are copies of corrected salinity figures to replace those appearing in the Third Quarterly Report. Corrections for the related temperature figures were submitted previously.

If you have any questions concerning these items, please contact Mr. Paul J. Behrens in St. Petersburg at 813/866-5521.

Sincerely,

FLORIDA POWER CORPORATION

William S. O'Brien

William S. O'Brien
Director
Environmental & Licensing Affairs

PJB/taf

Enclosures

cc: Mr. C. H. Kaplan, EPA
Mr. D. Hicks, EPA
Mr. J. P. Subramani, FDER
Dr. L. A. Olsen, FDER
Dr. D. Farrell, FDER
Mr. J. W. Pulliam, FWS, w/o Enclosure
Mr. J. R. Carroll, FWS
Mr. J. T. Brawner, NMFS, w/o Enclosure
Dr. E. Keppner, NMFS

NOTES OF CONFERENCE
FOURTH QUARTERLY PROGRESS MEETING
FLORIDA POWER CORPORATION

J.O.No. 14498

Held in the Offices of
Mote Marine Laboratory
Sarasota, FL
August 2, 1984

Present for:

Florida Power Corporation (FPC)

*P. Behrens
*D. Voigts

U.S. Environmental Protection Agency (EPA)

*D. Hicks
C. Kaplan

Florida Department of Environmental Regulation (DER)

D. Farrell
L. Olsen

Mote Marine Laboratory (MML)

S. Mahadevan
*Various Team Leaders

Stone & Webster Engineering Corporation (SWEC)

T. Biffar
T. Folger
D. McDougall

*Part-time

PURPOSE

The meeting constituted the Fourth Quarterly Progress Meeting for the Crystal River NPDES 316 (a) and (b) Studies.

DISCUSSION

Attachments 1 and 2 provide the meeting agenda and a partial attendance list. Several individuals were delayed en route and arrived about an hour late. Many of the MML team leaders attended part of the meeting and were available to informally answer questions.

The meeting began with some general comments by T. Biffar. Field collections have been completed for all components except water quality, macrophytes, entrainment and meteorology. Sample analysis and data computerization will be completed in September. The remaining data tables will be prepared to complete the sets in the quarterly reports. These should be available in October. Only fully verified data will be included. Benthos laboratory analysis is lagging and related tables may be late.

Current tables bring entrainment up to date and completes the impingement and fisheries data. It was noted that the February impingement data in the Third Quarterly Report are for only two weeks, the present tables are for the entire month. The report includes a table with time of sampling windows and magnitude of the tide for weekly water quality sampling. A table was passed out which provided exact time of sampling by station and water depth. Corrections to Table 2-1 were noted.

It was agreed that thermograph data will be prepared in the formats previously prepared. In addition, a table of weekly average, maximum and minimum values will be provided.

The field and laboratory efforts have been going well and generally on schedule. Aerial photographs have been difficult to get; the last set was only about 60 percent useful. The EPA overflight did result in good pictures; D. Hicks will make these available to MML. Polychaete taxonomy is the reason for delay in benthos analysis. Species saturation was analyzed through February with results similar to earlier findings. Thus, replication is considered adequate.

Further ideas on final analysis were solicited but generally the previously discussed outline was considered adequate. The desirability of keeping the analyses simple was stressed. An ANOVA of benthos density and species composition overview were suggested by D. Farrell; log normal curves may be used as well.

The calibration and verification of the far field models CAFE and DISPER were reviewed. The completion of this modeling phase is imminent. The final network of finite elements was shown and the locations of oyster bars were pointed out.

Typical results, one for flood tide and one for ebb tide, were displayed for CAFE. The computer plots of velocity vectors illustrated the impedance of flow across the rigorously simulated oyster bars near the discharge point. In a region remote from the discharge point, where oyster bar alignment was mixed, a simplified simulation with locally reduced depth was evident.

The formal calibration of CAFE was primarily achieved by matching model and field data values of tide height near shore. Tide height was used since current velocity was recognized to be less important in shallow areas. The figure displayed at the meeting showed the match at Station 13. These data were considered representative and the station is one of the more important stations against which to calibrate. Confirmation of a successful calibration by tide height was achieved by comparing results of tide flux (velocity times depth) at Station 15 offshore. The figure showed the match of field data and model output to be good.

Whereas calibration of CAFE was performed for a mixed tide condition from the August 1983 survey, verification was achieved for a semidiurnal tide condition from the January 1984 survey. Station 13 was again viewed as representative. The verification was reported to be excellent. Furthermore, since the primary mechanism for constituent transport is advection, the confidence which can be attached to the results of DISPER is high.

DISPER is calibrated by assigning a distribution of dispersion coefficients to account for the remaining constituent transport not achieved by advection. The distribution of salinity was recognized to be the better discriminator of dispersion than temperature rise. Model results are not very sensitive to the value of the dispersion coefficient, but very sensitive to the correct values at the boundaries.

Examples of the model results and field data - color coded contours of isopleths for each - were shown. It was noted that model results represent a somewhat different condition than field data results. The field data represent, for a relatively short period of time, the dominant advective transport and all of the transport due to turbulent fluctuations and larger eddies. If the field measurements were repeated with all of the parameters describing field conditions unchanged, the isopleths would not be exactly the same owing primarily to the random nature of eddies. Eddy motion is not captured by the field current measurements, and to account for this component of advection a model lumps this effect into the dispersion term with its augmented dispersion coefficient. The model predictions tend to produce an average result. Comparison of model and field results is still valid, but an exact superposition of corresponding isopleths should not be expected.

Three samples were shown of calibration results in the northeast corner of the model region, where most of the field data exists from the short term plume delineation survey. The results of the calibration were very good.

Two samples were shown of preliminary verification results. The comparison was favorable, but some further examination of the field boundary results is presently underway. The dispersion coefficients will remain unchanged. It was suggested by C. Kaplan that an additional comparison could be made of predictions generated at each grid node to data from the plume delineation surveys.

Production runs with the models will begin very soon. No decision regarding a near field model has been made. A review was made of the limitations of near field surface discharge models, as discussed in the April 4, 1984 special meeting in Atlanta.

TBiffar:PBF

ATTACHMENT 1

AGENDA

FOURTH QUARTERLY PROGRESS MEETING

CRYSTAL RIVER NPDES STUDIES

1. INTRODUCTION - P. BEHRENS
2. PROJECT OVERVIEW - T. BIFFAR
3. FIELD WORK AND LABORATORY ANALYSIS - S. MAHADEVAN
4. HYDRODYNAMIC AND HYDROTHERMAL MODELING - D. McDOUGALL
5. DISCUSSION

ATTACHMENT 2

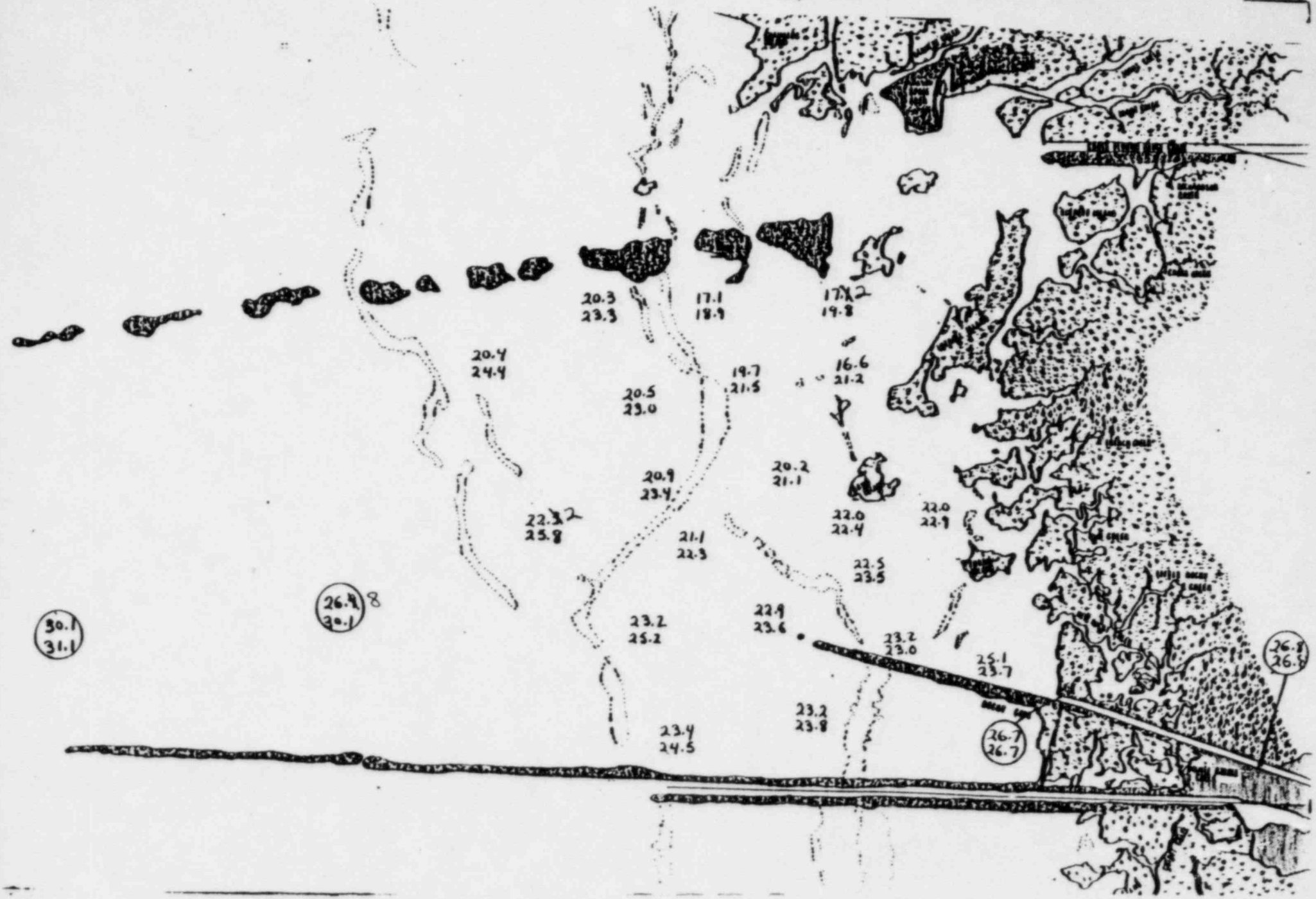
FOURTH QUARTERLY PROGRESS MEETING

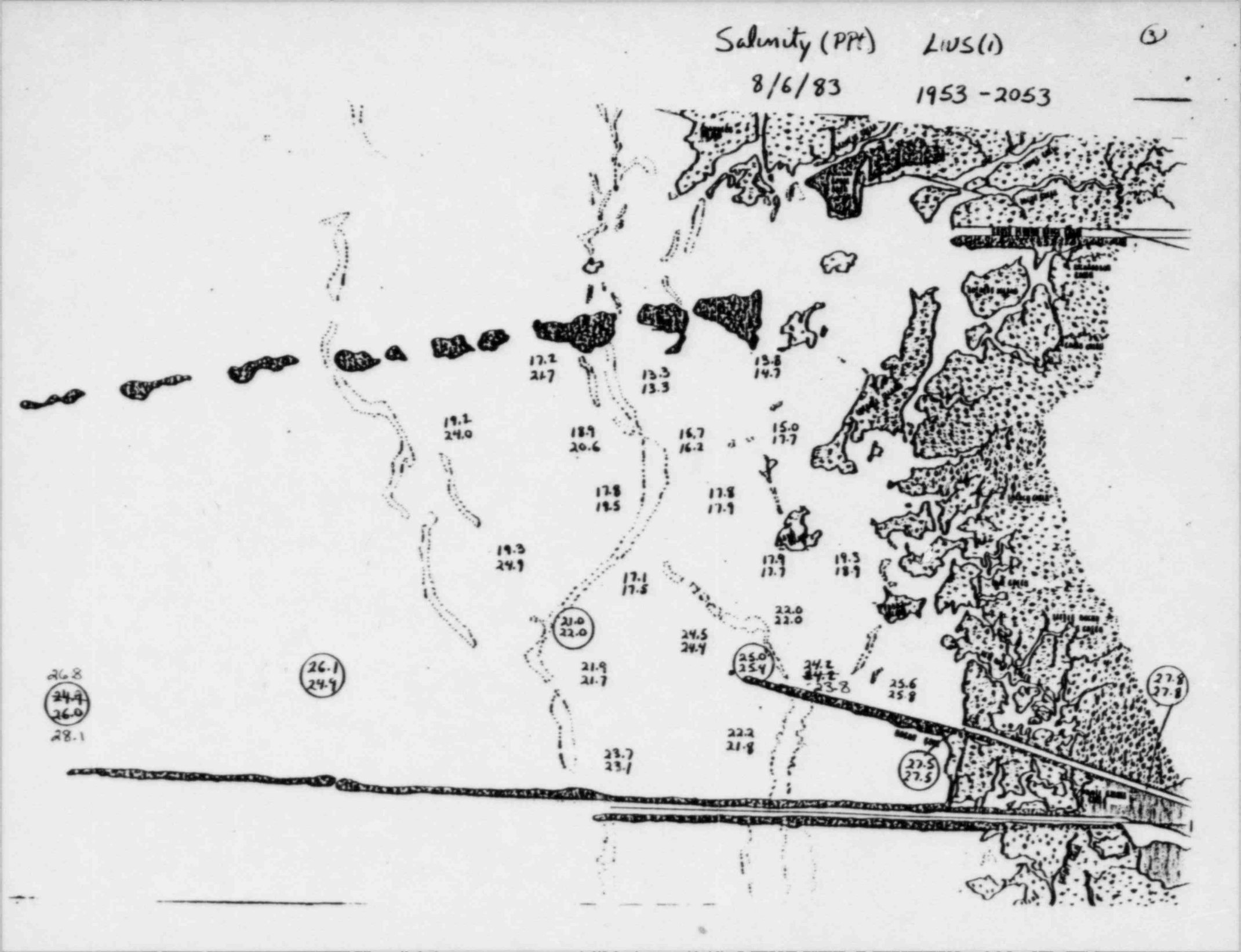
AUGUST 2, 1984

Tom Biffar	Stone & Webster	617-589-2725
Lawrence Olsen	Florida DER	904-487-2245
Kumar Mahadevan	Mote Marine Lab	813-388-4441
Douglas Farrell	FDER	813-985-7402
David W. McDougall	Stone & Webster	617-245-4456
Geoffrey Wm. Patton	MML	813-388-4441
Thomas A. Folger	Stone & Webster	609-482-3222
Charles H. Kaplan	EPA	404-881-3012
David Voigts	FPC	813-866-5166
Paul Behrens	FPC	813-866-5521
Robin Lewis	MSI	813-875-3614
Rob Mattson	MSI	813-875-3614
Jim Derrenbacker	MSI	813-875-3614
Robert Whitman	MSI	813-875-3614
Delbert Hicks	EPA	

Survey #1 Salinity (PPt) HWS (1) (1)

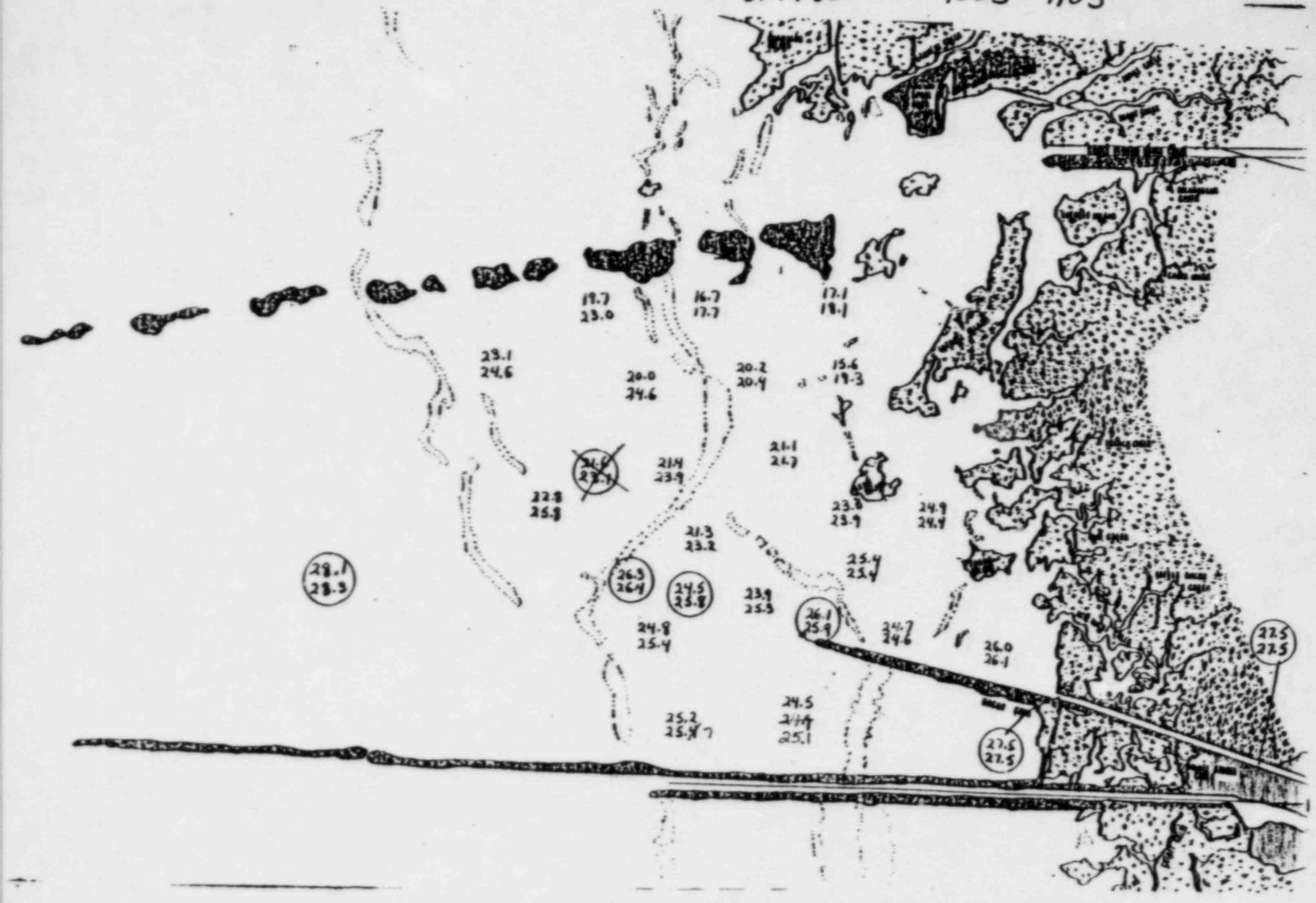
8/6/83 1136 - 1236

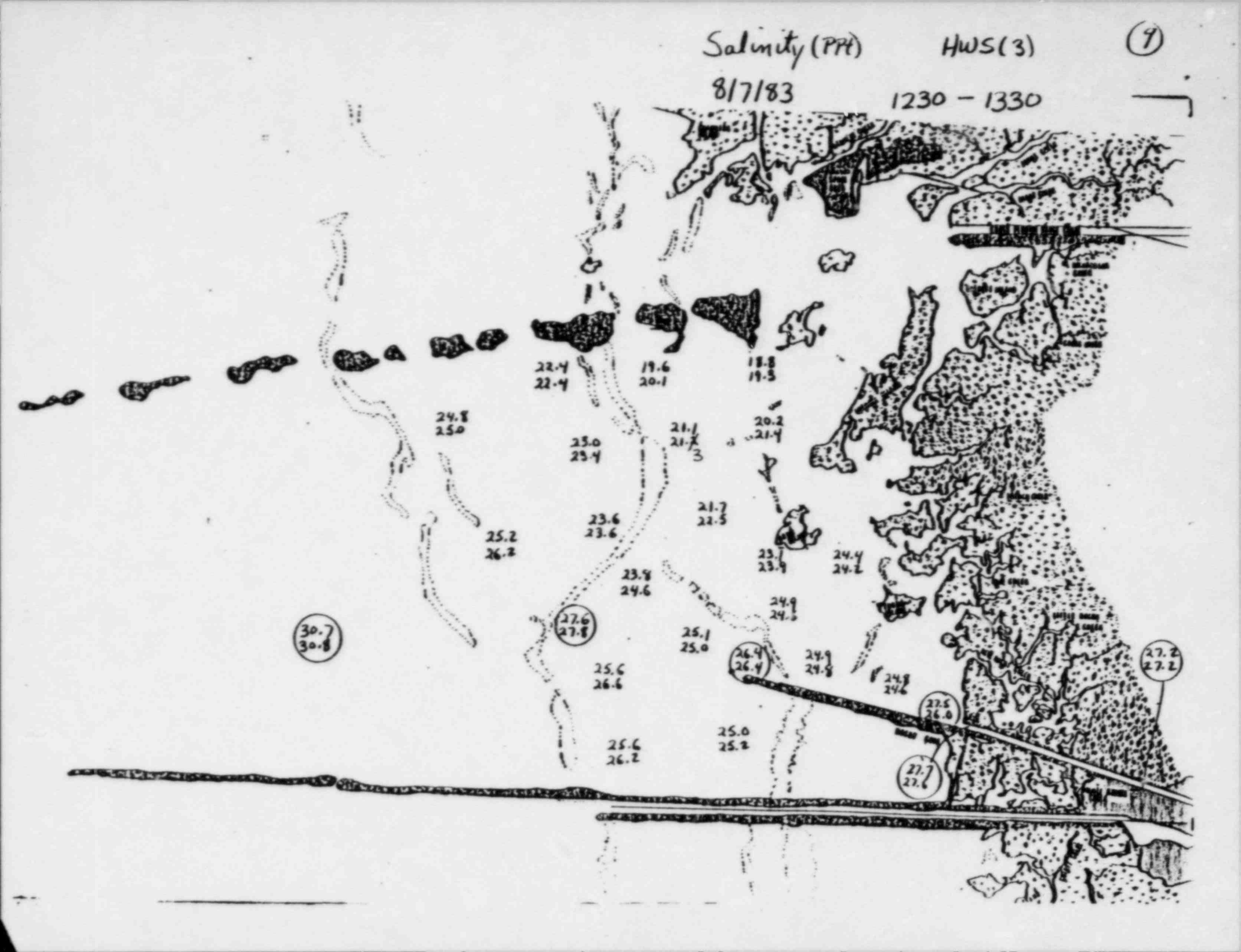


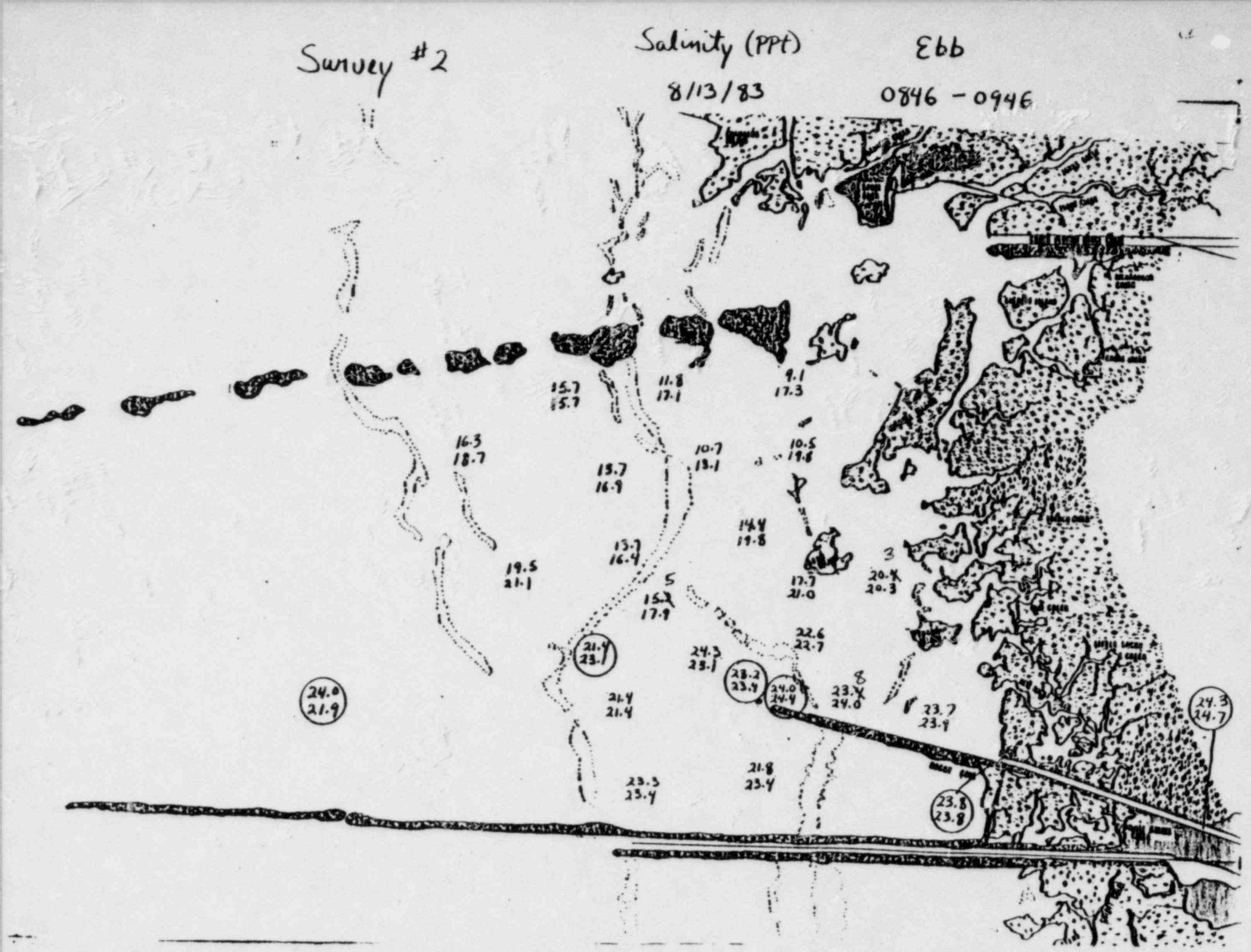

Salinity (PPt)
8/6/83
LIUS(1)
1953 - 2053
17.2
21.7
13.3
13.3
13.8
14.7
19.2
24.0
18.9
20.6
16.7
16.2
15.0
17.7
17.8
19.5
17.8
17.9
19.3
24.9
17.9
17.7
19.3
18.9
17.1
17.5
22.0
22.0
21.0
22.0
24.5
24.4
25.0
25.4
24.2
24.2
25.6
25.8
21.9
21.7
26.8
24.9
26.0
28.1
26.1
24.9
27.8
27.8
22.2
21.8
23.7
23.1
22.5
22.5

Salinity (ppt) Flood (2)

8/7/83 1003 – 1103

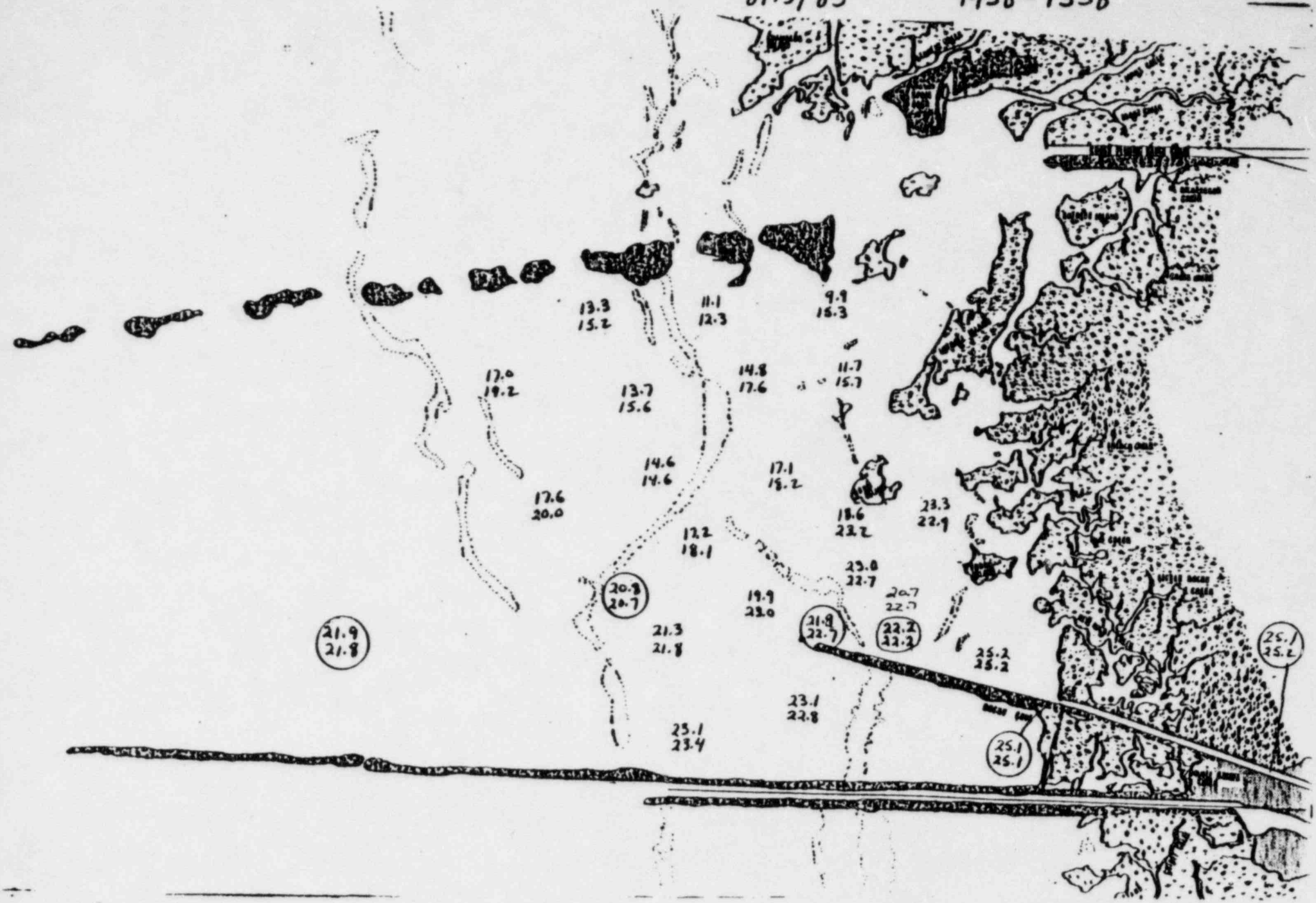



Salinity (PPt)
HWS(3)
9
8/7/83
1230 – 1330
22.4
22.4
19.6
20.1
18.8
19.3
24.8
25.0
21.1
21.3
20.2
21.4
25.0
25.4
21.7
22.5
23.6
23.6
25.2
26.2
23.1
23.9
24.4
24.2
23.8
24.6
24.9
24.8
27.6
27.8
30.7
30.8
25.1
25.0
26.4
26.4
24.9
24.8
24.8
24.2
27.2
27.2
25.6
26.6
27.5
26.0
25.0
25.2
25.6
26.2
27.7
27.6


Survey #2
Salinity (PPt)
8/13/83
Ebb
0846 - 0946
15.7
15.7
11.8
17.1
9.1
17.3
16.3
18.7
10.7
13.1
10.5
19.8
13.7
16.9
14.4
19.8
13.7
16.4
19.5
21.1
15.2
17.9
17.7
21.0
20.4
20.3
22.6
22.7
21.4
23.1
24.3
25.1
28.2
23.9
24.0
24.4
24.0
21.9
21.4
21.4
23.4
24.0
23.7
23.9
24.3
24.7
21.8
23.4
23.3
23.4
23.8
23.8

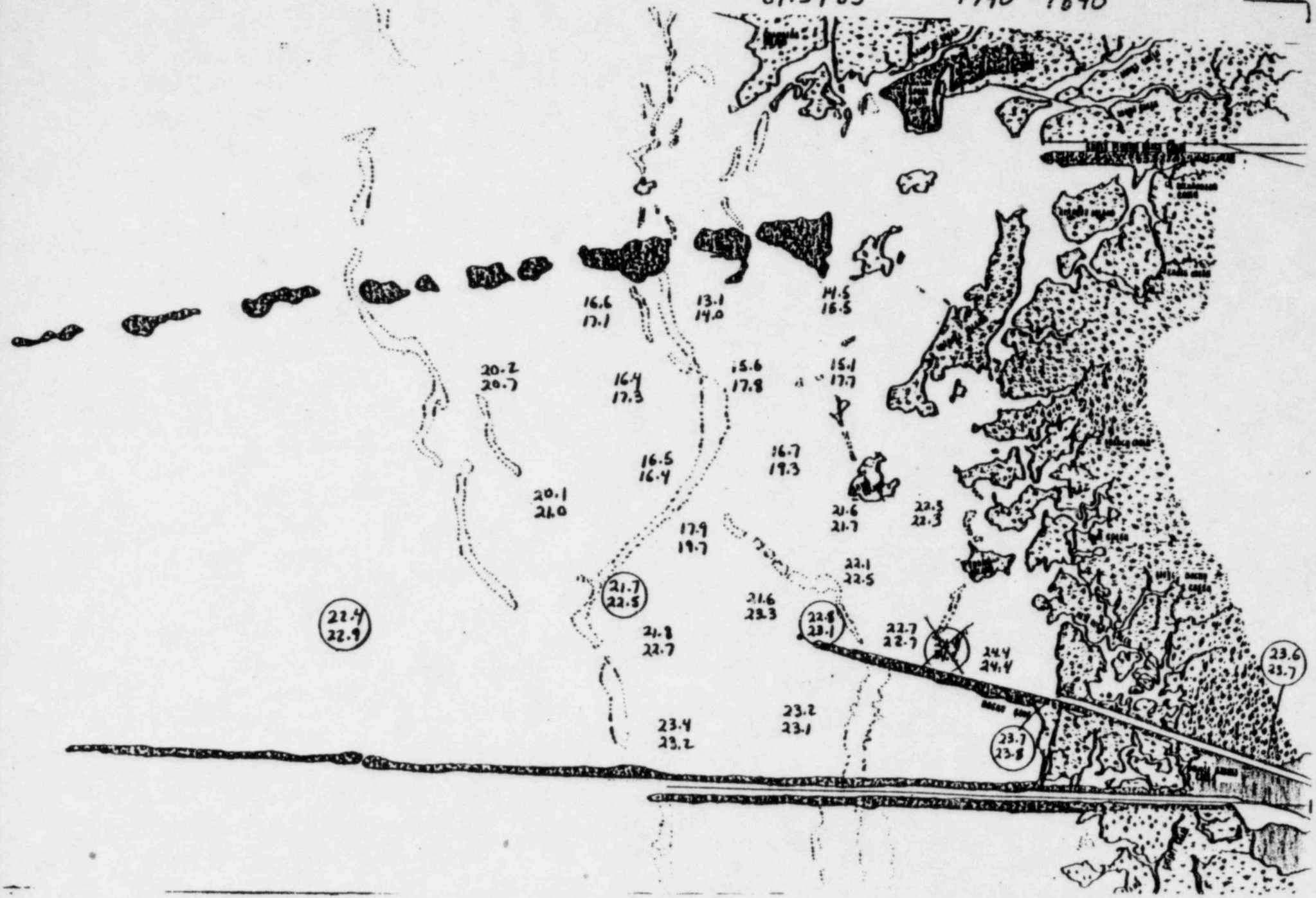
Salinity (PPt) Flood

8/13/83 1458 - 1558



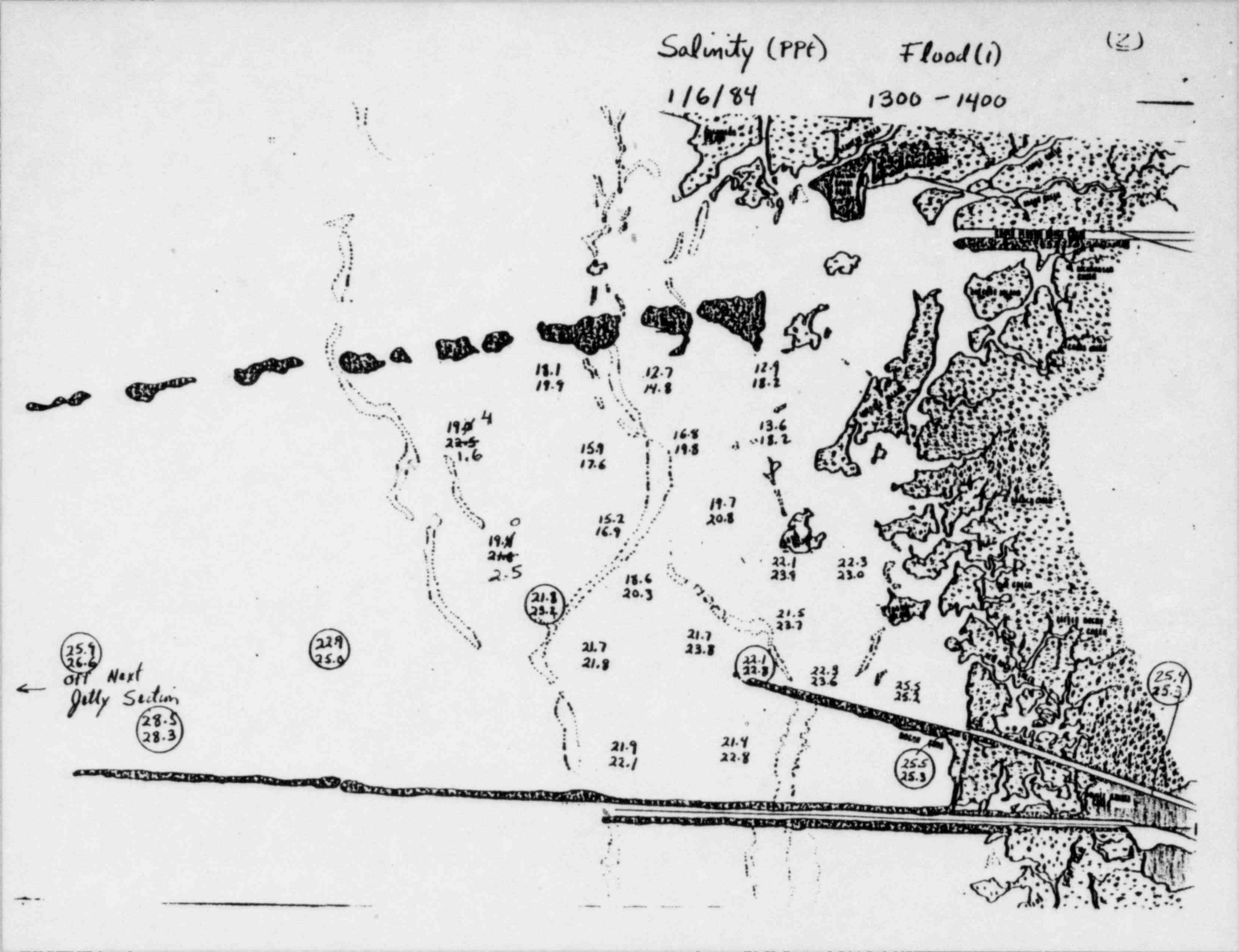
Salinity (PPT) HWS

8/13/83 1740 - 1840



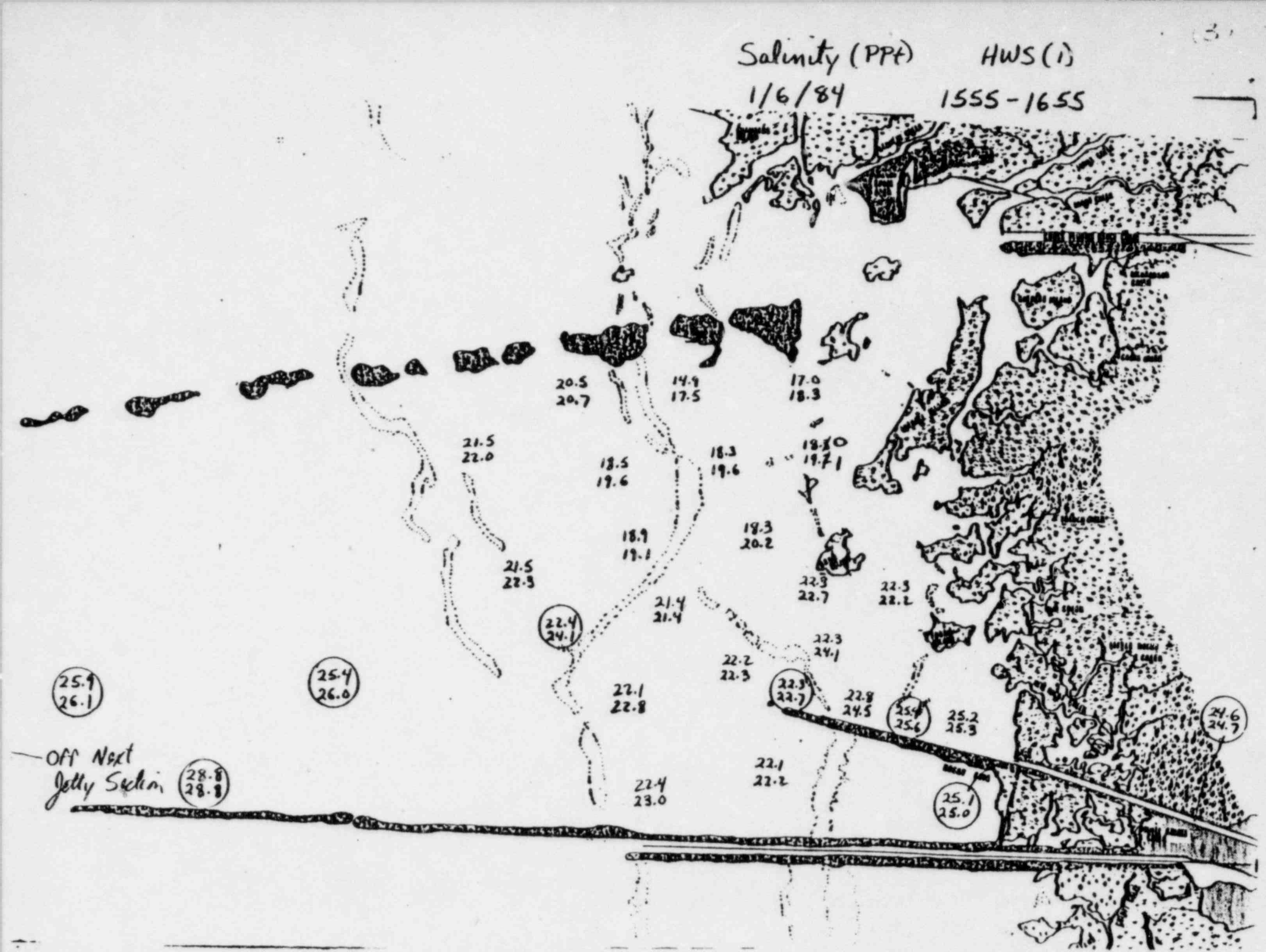
Salinity (ppt) Flood (1)

1/6/84 1300 - 1400



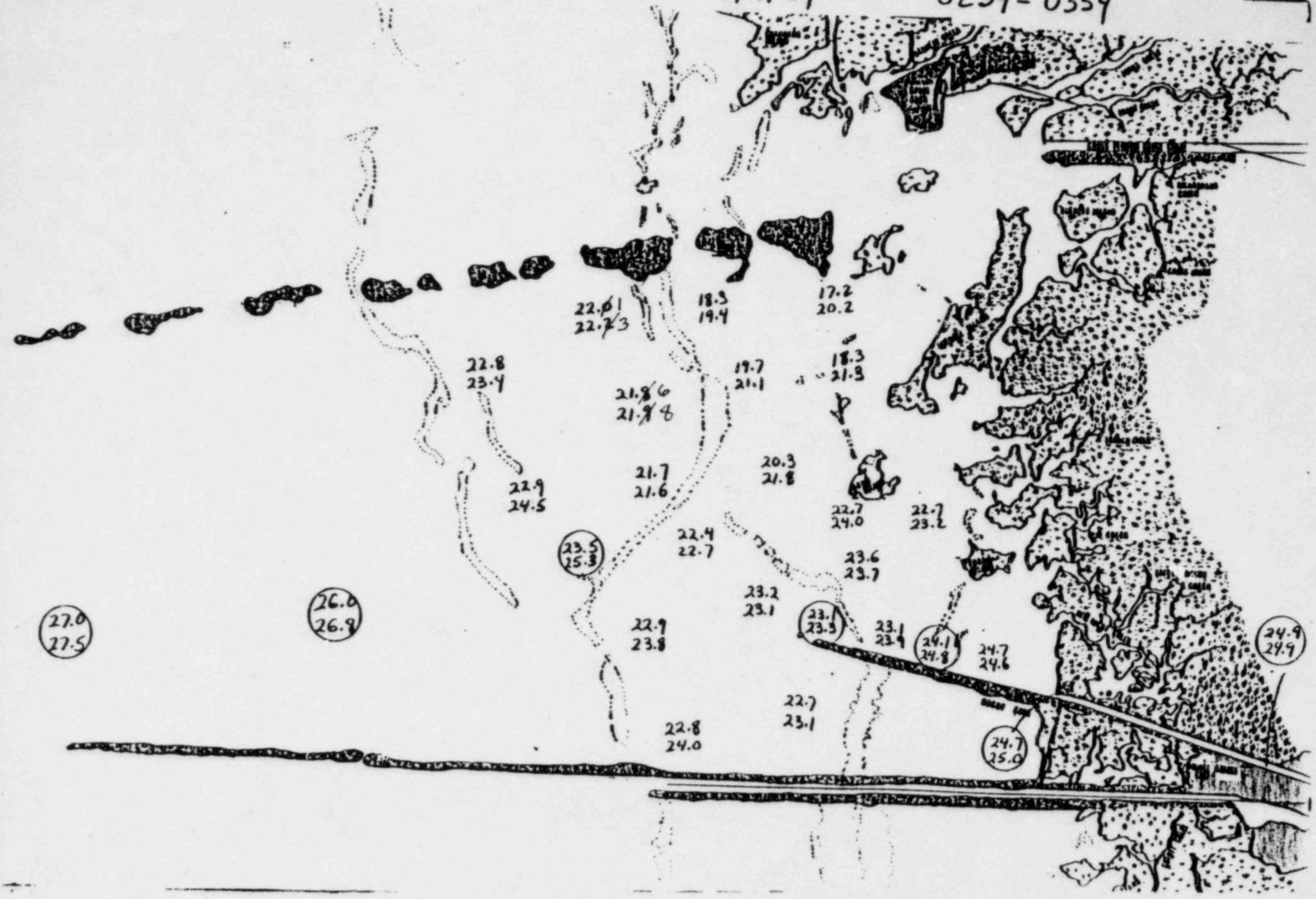
Salinity (PPt) HWS (1)

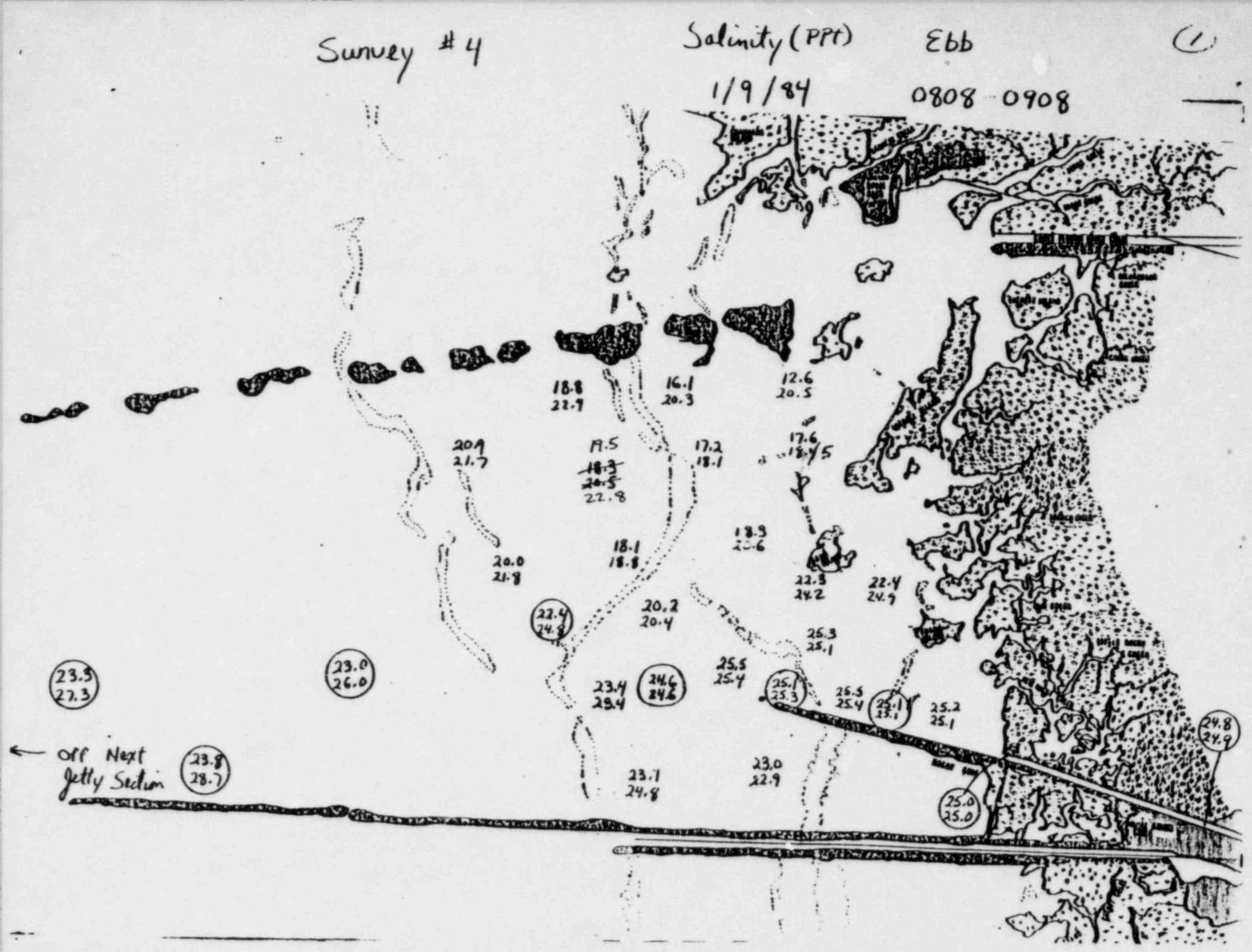
1/6/84 1555 - 1655

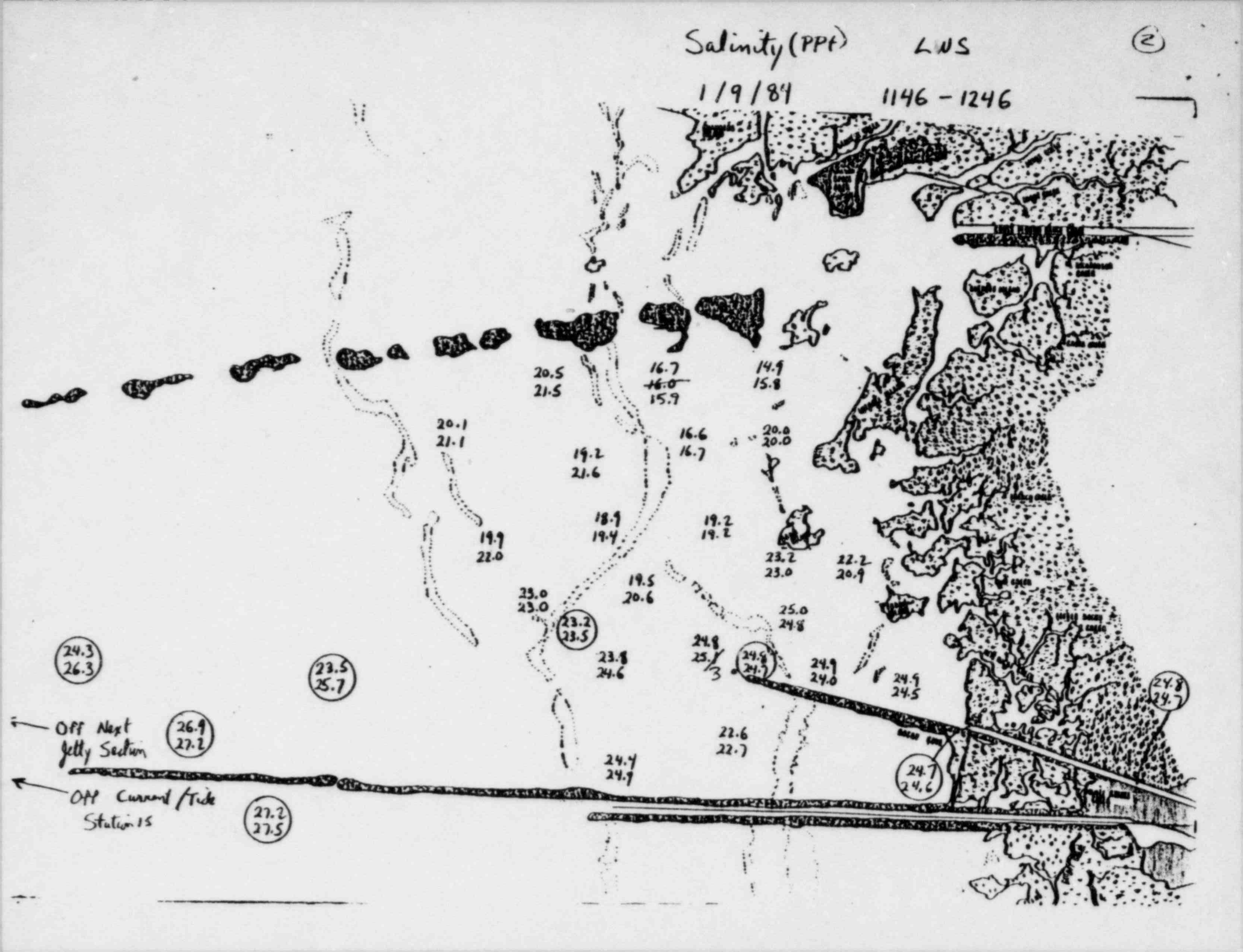


Salinity (PPt) HWS(2)

1/7/84 0254-0354




Survey #4
Salinity (PPT)
Ebb
(1)
1/9/84
0808 - 0908
18.8
22.9
16.1
20.3
12.6
20.5
20.9
21.7
17.2
18.1
17.6
18.5
22.8
18.9
20.6
18.1
18.8
20.0
21.8
22.3
24.2
22.4
24.9
22.4
24.8
20.2
20.4
26.3
25.1
25.5
25.4
23.5
27.3
23.0
26.0
23.4
24.6
24.2
25.1
25.3
26.5
25.4
25.1
23.1
25.2
25.1
24.8
24.9
off Next
Jetty Section
23.8
28.7
23.1
24.8
23.0
22.9
25.0
25.0


Salinity (ppt) LWS
1/9/84 1146 - 1246
(2)
20.5
21.5
16.7
16.0
15.9
14.9
15.8
20.1
21.1
16.6
16.7
20.0
20.0
19.2
21.6
18.9
19.4
19.2
19.2
19.9
22.0
23.2
23.0
22.2
20.9
19.5
20.6
23.0
23.0
25.0
24.8
23.2
23.5
24.8
25.3
24.8
24.7
24.9
24.0
24.9
24.5
23.8
24.6
24.3
26.3
23.5
25.7
24.8
24.7
Off Next Jetty Section
26.9
27.2
22.6
22.7
24.4
24.9
24.7
24.6
Off Current/Tide Station 15
27.2
27.5

Salinity (ppt) HWS

1/9/84 1730-1830