115. Granz, Daniel, S. (USEPA), 10/13/82
"PCB Sampling at Cornell Dubilier, New Bedford, MA".

116. Szal, Gerald M. (Mass. DWPC), 05/17/82
Memorandum to Thomas C. McMahon (DWPC); "Route 6 Bridge Sediment Analyses".

117. Mass DWPC, 04/01/82
"Fairhaven Bridge Sediment Samples".

118. Mass DPW, 06/11/82
"New Bedford Bridge Sediment Samples".

119. Malcolm Pirnie, Inc., 09/15/82
"Acushnet River Estuary PCB Study"; prepared for Mass. DWPC.

120. ERCO/Energy Resources Co, Inc. 8/82
"Results of Sedimentation Test on Sediment from the Acushnet River Estuary", Prepared for Geotechnical Engineers.

121. DEQE, 03/10/81
"Special Analysis";
PCB analysis of New Bedford wastewater samples.

122. DEQE, 12/17/26
"Special Analysis";
PCB analysis of market seafood samples.

123. DEQE, 05/10/78
"Special Analysis";
PCB analysis of New Bedford Harbor sediments.

124. Nadeau, Royal J. (USEPA), 08/18/82
Letter to George Ireland, (Capt. USCG); Draft Scope of Work, Migrations of PCBs in New Bedford Harbor.

125. USCG, 06/11/82
"Acushnet River Sediment Sample Analysis Report", 724154.3
Ref: (a) COMDT (G-DMT-4/54) ltr 3913 Ser: 4-1202 of 11 Mar 1982.

126. USCG, 07/11/82
"Acushnet River Sediment Sample Analysis Report, Mobile Laboratory Deployment", 724154.3
Ref: (a) CO, R&DC ltr 724154.3 of 11 Jun 1982.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY USA CHARLESTON

Ref # 115

DATE: October 13, 1982

SUBJECT: PCB Sampling at Cornell Dubilier, New Bedford, MA

FROM: Daniel S. Granz D.S.G. 861-6700
Environmental Engineer

PAGE 14

TO: Jerry Sotolongo

On August 31, 1982, I sampled 6 drums at random out of more than 50 drums of sediment from cleaning New Bedford sewer lines. These drums of sediment are stored at Cornell Dubilier and assumed to contain PCB's. Jerry Sotolongo (EPA), George Alexander (Cornell Dubilier), and Jerry Cura (EG&G Environmental Consultants) were also present. Mr. Cura also took samples of the same drums (Note: these were not split samples because a homogeneous mixture could not be obtained).

The analyses are as follows:

Drum	Sample #	Concentration ug/g dry weight (PPM) PCB Aroclor 1242	Concentration ug/g dry weight (PPM) PCB Aroclor 1254
25	74623	ND	13,900
34	74624	ND	25,200
47	74625	ND	13,800
76	74626	19,200	13,000
56	74627	25,900	ND
62	74628	14,400	ND

ND - Not detected - 1 PPM detection limit

No PCB aroclors 1221, 1232, 1016, 1248, 1260, 1262 were detected in any of of the samples (detection limit 1 PPM).

An EPA quality assurance soil sample containing 24.6 ppm PCB aroclor 1242 was also analyzed. The result was 15.0 ppm PCB aroclor 1242.

Ref #116

R. Tomcyzk

core for DPW's E IR

MEMORANDUM

RECEIVED

1982 MAY 20 AM 9:32

DIV. OF WATER POLLUTION CONTROL

See also: Ref. 117 + 118

TO: Thomas C. McMahon, Director, DWPC, Boston

FROM: Gerald M. Szal, Aquatic Biologist, TSB, Westborough G. Szal

DATE: May 17, 1982

SUBJECT: Route 6 Bridge Sediment Analyses

Analyses by Lawrence Labs of the first of two phases of sediment sampling for the DPW's Route 6 Bridge project are complete and are attached to this memo. Sample collection for the second phase of sampling (collection of deep cores by DPW) was completed on Friday, May 14. The results of this latter set of samples should be completed within four weeks if Lawrence does not run into any equipment problems.

In addition to the Lawrence report, I have also attached the following to this memo: a) a map of sediment sampling locations (Fig.1) for the first phase of sampling, and, b) a generalized map of the Route 6 Bridge with proposed access road added. Concerning the notation used in these reports, the column heading "source" refers to sample locations in Figure 1. Letters after each number in the "source" column refer to the sampling device used to procure each sample: a "P" or "C" denotes that the sample was taken with a Peterson dredge or coring device, respectively. In each case only surface sediments (the top 2-6" with the Peterson and the top 6-12" with the coring unit) were collected and analyzed. A prime (') after a sample refers to a replicate sample taken at that location.

Results

Four of the 20 samples analyzed had PCB concentrations greater than the EPA's Toxic Sustances Control Act "action level" of 50 ppm dry weight. Two of these four samples were taken at the same location, so effectively 16 percent (3 samples/ 19 stations) of the sample locations had high PCB readings. As a caveat to these readings, I would add that Richard Tomcyzk pointed out to me that four of the five highest readings were from core samples. Since the cores penetrated into deeper sediments than did the Peterson dredge, it appears that a surface of relatively clean sediments may be overlying more contaminated sediments a few inches down. The analysis of DPW's cores should more clearly elucidate the stratification of PCB concentrations with depth.

With respect to metals, many of the samples had very high levels, however, none of the EP toxicity values exceed the maximum allowable concentration levels listed in the Federal Register. I spoke briefly to George Minasian at Lawrence Labs about these results and he is of the opinion that even though the metals are high, they must be tightly bound to the sediments to exhibit such low EP toxicity values. Therefore, these metals would not be expected to leach out of the sediments under the range of conditions specified in the test.

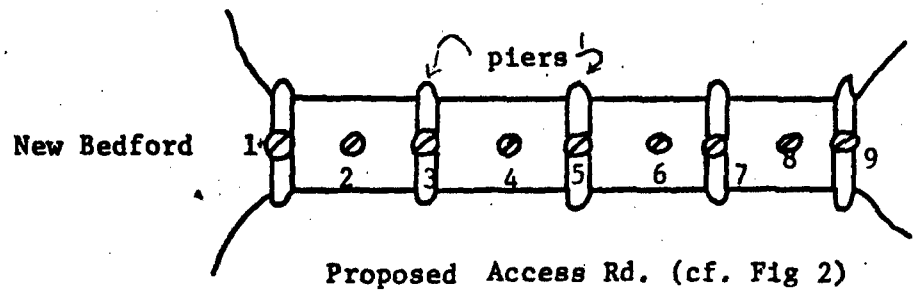
I am sending these results out to individuals involved in the permitting process, but I feel that, due to the problem mentioned above concerning the interpretation of the PCB results, judgments about the hazardous waste component of the sediments should only be made after the analyses of the DPW's cores have been completed.

GMS/tv

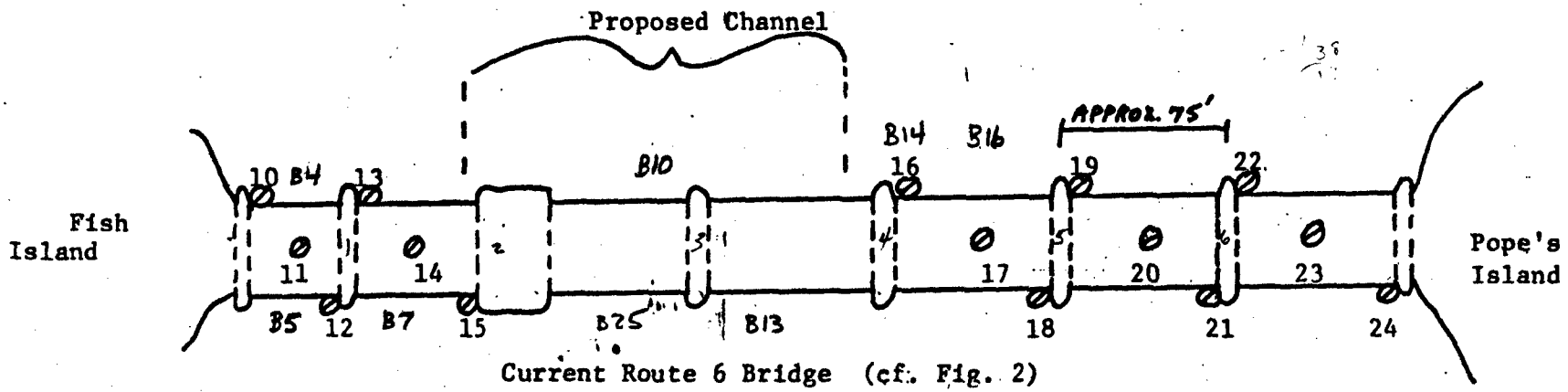
Attachments

cc: T. McLoughlin
G. Prendergast
R. Tomcyzk
G. Weaver
J. Okun
J. Hannon
P. T. Anderson

Figure 1

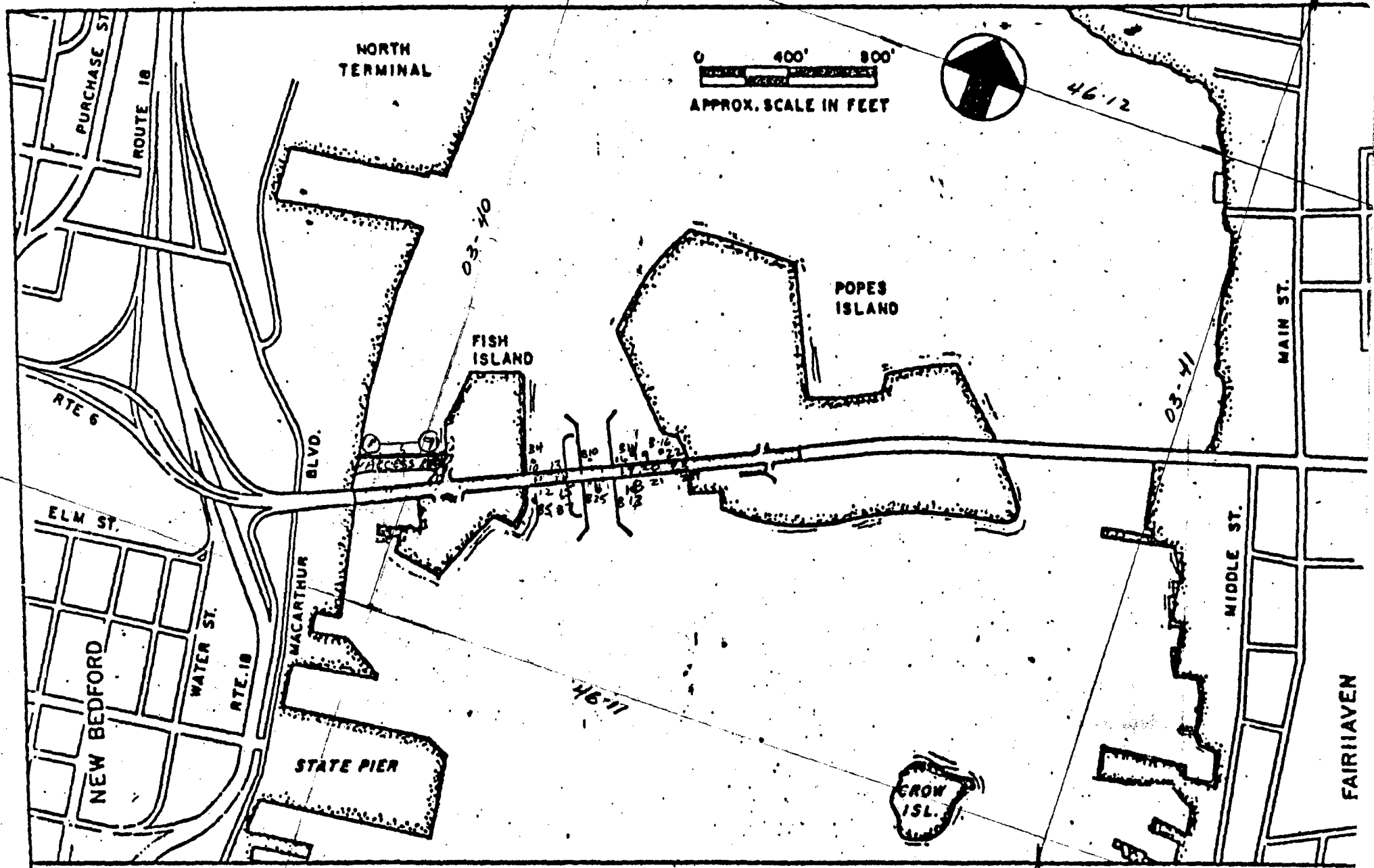


Proposed Access Rd. (cf. Fig 2)



Current Route 6 Bridge (cf. Fig. 2)

⌀ = sample location; Numbers refer to samples analyzed by Lawrence Lab (see attached report).



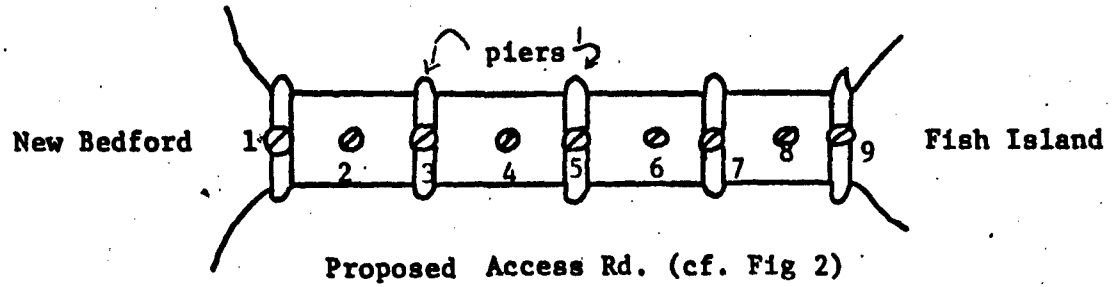
NEW BEDFORD-FAIRHAVEN BRIDGE

Figure 2.

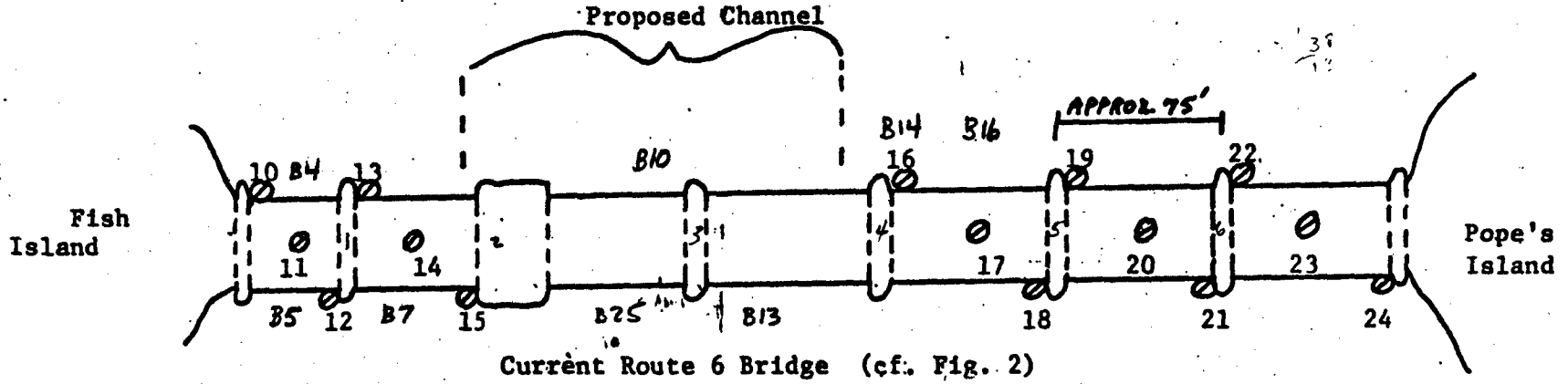
EP-TOXICITY

FILE NO.		SOURCE	COPPER 506	LEAD 507 (>5 = Hzd waste)	ZINC 514	CHROMIUM 505	CADMIUM 504	NICKEL 510	SILVER 512	MERCURY 509	ARSENIC 502
006254	1264	2-P	360	140	210	130	1.9	20	1.9	0.46	5.6
006255	1265	3-P	250	130	170	100	1.9	28	1.9	0.40	6.2
006256	1266	4-P	1,100 / 1.4	300 / 0.61	720 / 16	580 / 0.09	14 / 0.44	68 / 0.84	6.0 / 0.01	0.72 / 0.0011	15 / 0.?
006257	1267	8-P	1,400	170	570	800	27	78	3.8	1.3	11
006258	1268	10-P	220	340	280	90	3.9	35	2.0	0.20	4.7
06259	1269	11-P	300	220	390	100	3.9	39	0.0	0.47	4.7
06260	1270	12-P	300	280	360	140	4.0	40	2.0	0.43	4.4
06261	1271	15-P	1,900 / 2.1	380 / 4.0	950 / 12	470 / 0.32	9.5 / 0.25	45 / 0.54	1.9 / 0.02	0.47 / 0.0014	12 / 0.0?
06262	1272	17-P	540	540	380	300	9.9	48	5.9	0.66	6.5
06263	1273	18-P	220	(1,300)	220	110	7.5	30	3.9	0.59	15
16264	1274	20-P	710	340	500	410	5.9	51	5.9	0.65	6.7
6265	1275	21-P	330	(940)	280	190	6.3	28	4.7	0.33	18
6266	1276	22-P	340	310	240	200	7.2	31	3.6	0.21	1.6
6267	1277	23-P	740	310	430	230	7.2	45	1.8	0.72	0.0
5268	1279	24-P	460	(610)	290	300	5.7	38	3.8	0.28	3.2
5269	1279	5-C	1,200	46	680	320	16	68	2.0	1.2	1.2
5270	1280	6-C	990	17	670	320	15	71	1.9	3.1	3.4
5271	1281	7-C	2,200	370	840	940	16	86	2.0	2.4	13
272	1282	7-C'	1,100	11	610	200	9.3	47	0.0	1.4	1.5
273	1283	9-C	970								

Figure 1

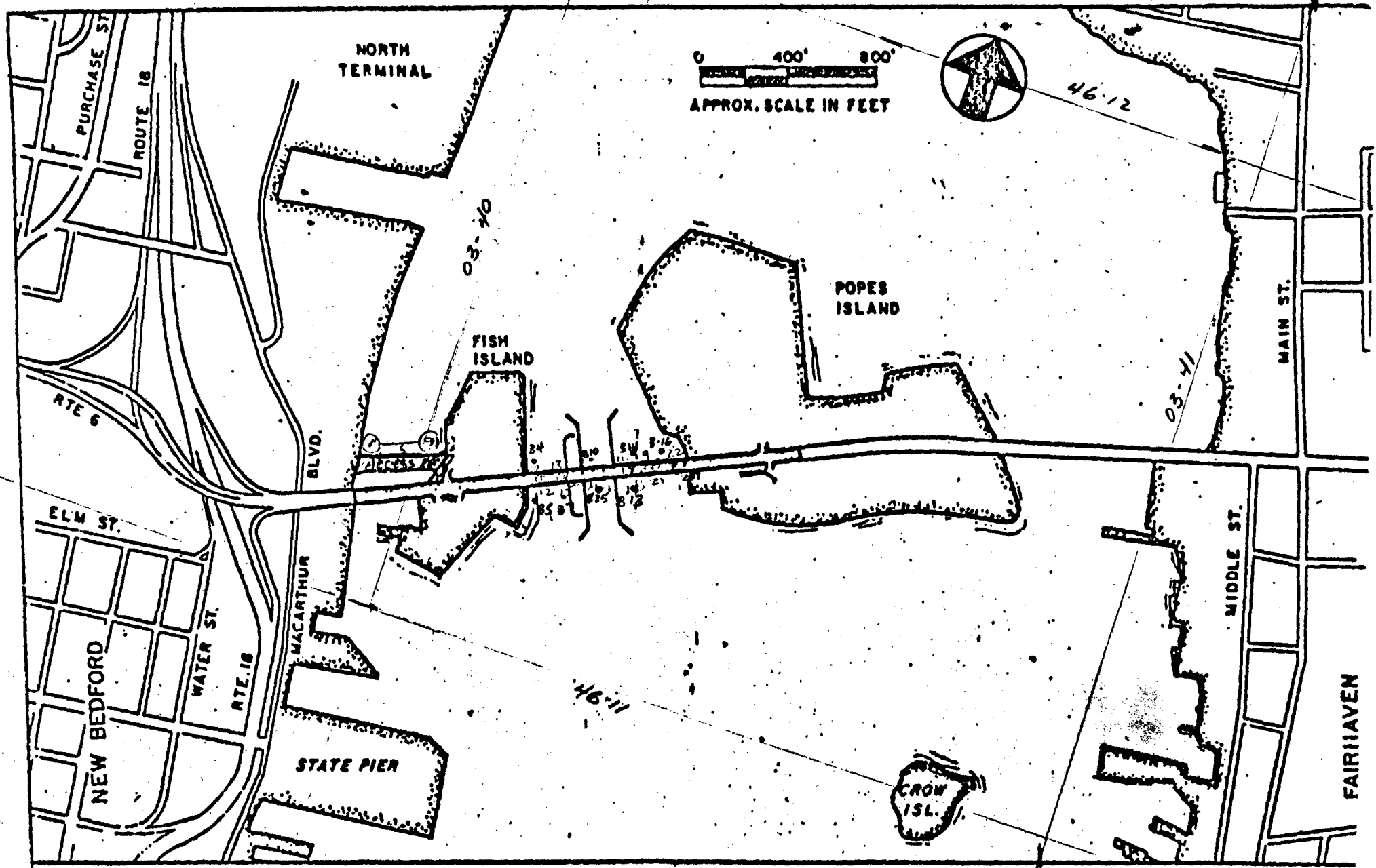


Proposed Access Rd. (cf. Fig 2)



Current Route 6 Bridge (cf. Fig. 2)

⊘ = sample location; Numbers refer to samples analyzed by Lawrence Lab (see attached report).



NEW BEDFORD-FAIRHAVEN BRIDGE

Figure 2.

FAIRHAVEN BRIDGE SEDIMENT SAMPLES

COLLECTOR: J. Szal

COLLECTED ON 4/1/82 - RECEIVED ON 4/1/82

ANALYSES CONDUCTED BY

LAWRENCE EXPERIMENT STATION

References for Analytical Methods:

Oil & Grease: "Standard Methods for the Examination of Water and Waste Water," 15th ed., 1980. p. 461, Section 503A.

Volatile Solids: "Standard Methods for the Examination of Water and Waste Water," 15th ed., 1980. p. 95, Section 209E.

Metals: "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, Section 200.0.

EP-Toxicity Test: Performed in accordance with the Federal Register Vol., 45, No. 98., May 19, 1980. Results expressed as Mg/l.

PCB's: Sediment subjected to soxhlet extraction, florisil cleanup and sulfur removal. Extract analyzed according to the supplement to Standard Methods for the Examination of Water and Waste Water, 15th ed.

	RCE	P = 2"–6" C = 6"–12" o/o Passi ve No.'s										o/o VOLATILE SOLIDS	GR PPM	PCB'S Mg/kg DRY WT
		140	100	60	40	25	18	10	6	4	2			
06254	2-P	39.2	8.9	17.5	12.4	9.8	4.7	5.1	2.4	0	0	4.9	29	10
06255	3-P	34.6	5.6	10.4	9.6	11	7.6	12.4	7.8	1.0	0	5.4	24	6.9
06256	4-P	10	3.3	10	9.3	11	10	18.2	18.2	10	0	14	26	36
06257	8-P	9.5	2.2	8.6	9.8	11	9.3	21.4	21.8	6.4	0	17	56	74
06258	10-P	5.8	4.4	22.2	25.2	15.8	7.5	10.7	8.0	0.4	0	7.9	29	7.6
06259	11-P	5.5	2.5	13.3	23	21.2	11.8	14.8	6.9	1.0	0	7.6	21	9.3
06260	12-P	4.4	1.1	6.7	14.3	19.7	14.9	23	14.3	1.6	0	4.8	17	6.9
06261	15-P	7.4	3.1	11.6	17.1	19	12.9	19.5	8.4	1.0	0	9.3	42	19
06262	17-P	8.9	2.0	5.3	7.2	10.7	11.6	24	24	6.3	0	10	13	13
06263	18-P	6.5	2.0	8.2	13.8	18	14.5	23	12.5	1.5	0	5.3	12	9.8
06264	20-P	12.9	3.5	8.1	9.3	12.9	12	23.5	16.4	1.4	0	11	19	18
6265	21-P	5.6	2.5	8.8	16.1	18.6	14	22	11.2	1.3	0	9.0	67	9.2
6266	22-P	5.9	1.6	5.9	9.8	14.4	13.8	25	14	4.2	5.4	8.6	11	9.6
6267	23-P	11.5	2.6	6.3	7.3	10.4	10.4	18.2	14.5	7.3	11.5	9.1	28	24
06268	24-P	11.5	4.1	11	12.5	14.4	11	16.5	11	4.8	3.2	5.8	9.5	17
06269	5-C	27.6	4.6	11.5	11.5	9.2	9.2	6.9	13.8	5.7	0	13	71	63
06270	6-C	23.2	3.9	11.6	8.5	9.0	7.7	15.4	12.9	3.9	0	15	28	47
06271	7-C	31.7	5.8	14.3	8.3	6.7	5.8	12.5	2.5	0.8	0	15	1,200	120
06272	7-C'	40.4	5.6	13.6	6.8	5.6	4.5	11.2	10.1	1.1	1.1	13	170	100
273	9-C	29.1	5.8	13.9	8.9	7.6	5.1	10.6	10.4	5.1	2.5	26	57	16

6/11/82

NEW BEDFORD BRIDGE SEDIMENT SAMPLES

COLLECTED BY: R. Tomczyk - DPW

Samples 006500-006505 Collected on 5/4/82 - Received on 5/6/82
Samples 006579-006592 Collected on 5/14/82 - Received on 5/14/82

Analyzed 5/17 — 6/11

ANALYSES CONDUCTED BY LAWRENCE EXPERIMENT STATION

References for Analytical Methods:

Oil & Grease: "Standard Methods for the Examination of Water and Waste Water," 15th ed., 1980. p. 461, Section 503A.

Metals: "Methods for Chemical Analysis of Water and Wastes,"-EPA-600/4-79-020, Section 200.0.

PCB's: Sediment subjected to soxhlet extraction, florisil cleanup and sulfur removal. Extract analyzed according to the supplement to Standard Methods for the Examination of Water and Waste Water, 15th ed..

Ref #118

N.D. = None Detectable - Total Metals Expressed as Mg/kg Dry Weight

	430	603	506	507	514	505	504	510	512	502	509
SAMPLE NO.	Core SOURCE	Tot. PCB's Mg/kg DRY WT.	OIL & GREASE ppm	COPPER	LEAD	ZINC	CHROMIUM	CADMIUM	NICKEL	SILVER	ARSENIC	MER
1284 006502	B-5 0- 3'	2.4	Insuffi-cient Samp.	180	900	320	40	0.0	20	0.0	1.3	c.29 0.
1285 006501	B-7 0- 2'	10.	2.2	860	620	170	110	0.0	20	0.0	1.2	0.30 0.
1286 006500	B-7 2- 4'	N.D.	0.0	10	16	16	3.9	0.0	0.0	0.0	0.2	0.01 0.
1287 06503	B-13 0- 2'	4.5	0.0	130	340	120	50	0.0	20	0.0	2.4	0.27 0.
1288 006505	B-13 6- 8'	N.D.	0.0	9.6	10	20	7.7	0.0	3.8	0.0	0.4	0.00 0.
1289 006504	B-13 10-12'	N.D.	0.0	5.4	20	10	5.4	0.0	1.8	0.0	0.2	0.00 0.
1290 006579	B-4 0 -2'	8.9	730									
1291 006580	B-4 4- 6'	2.7	60									
1292 006581	B-10 0- 2'	8.5	80									
1293 006582	B-10 2- 4'	2.7	50									
1294 006583 SURFACE DUP	B-10 4- 6'	N.D.	30									
1295 006584 0-2 2-4 4-6	B-10 6- 8'	N.D.	20									
1296 006585	B-14 0- 2'	4.8	16									
1297 006586	B-14 4- 6'	N.D.	10									
1298 006587	B-16 0- 2'	5.4	16	110	120	90	25	0.0	20	0.0	1.5	0.3
1299 006588	B-16 2- 4'	1.2	7.0	170	260	130	40	0.0	30	0.0	1.9	0.3
1300 006589	B-16 4- 6'	0.2	40	9.1	20	20	7.3	0.0	20	0.0	0.7	0.0
1301 006590	B-25 0- 2'	3.3	30	230	250	120	110	0.0	10	0.0	1.2	0.3
1302 006591	B-25 2- 4'	1.0	20	20	40	30	10	0.0	3.9	0.0	0.6	0.0
											1.7	cc

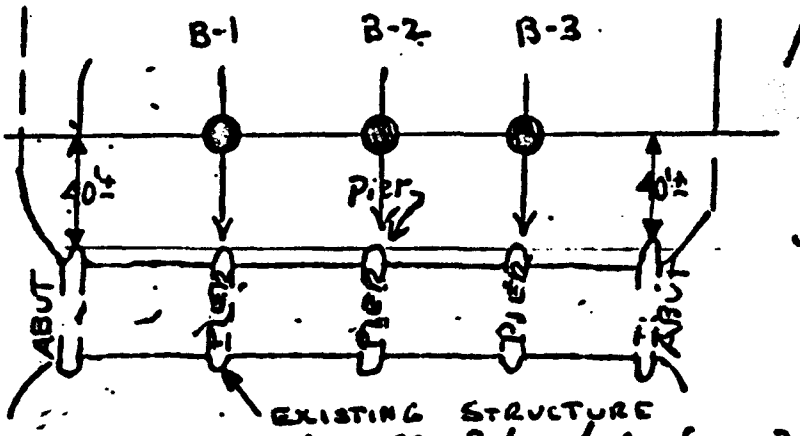
- NOT REQUESTED

AREA 2

DPW

EDGE SAMPLES WERE ON TRAVEL

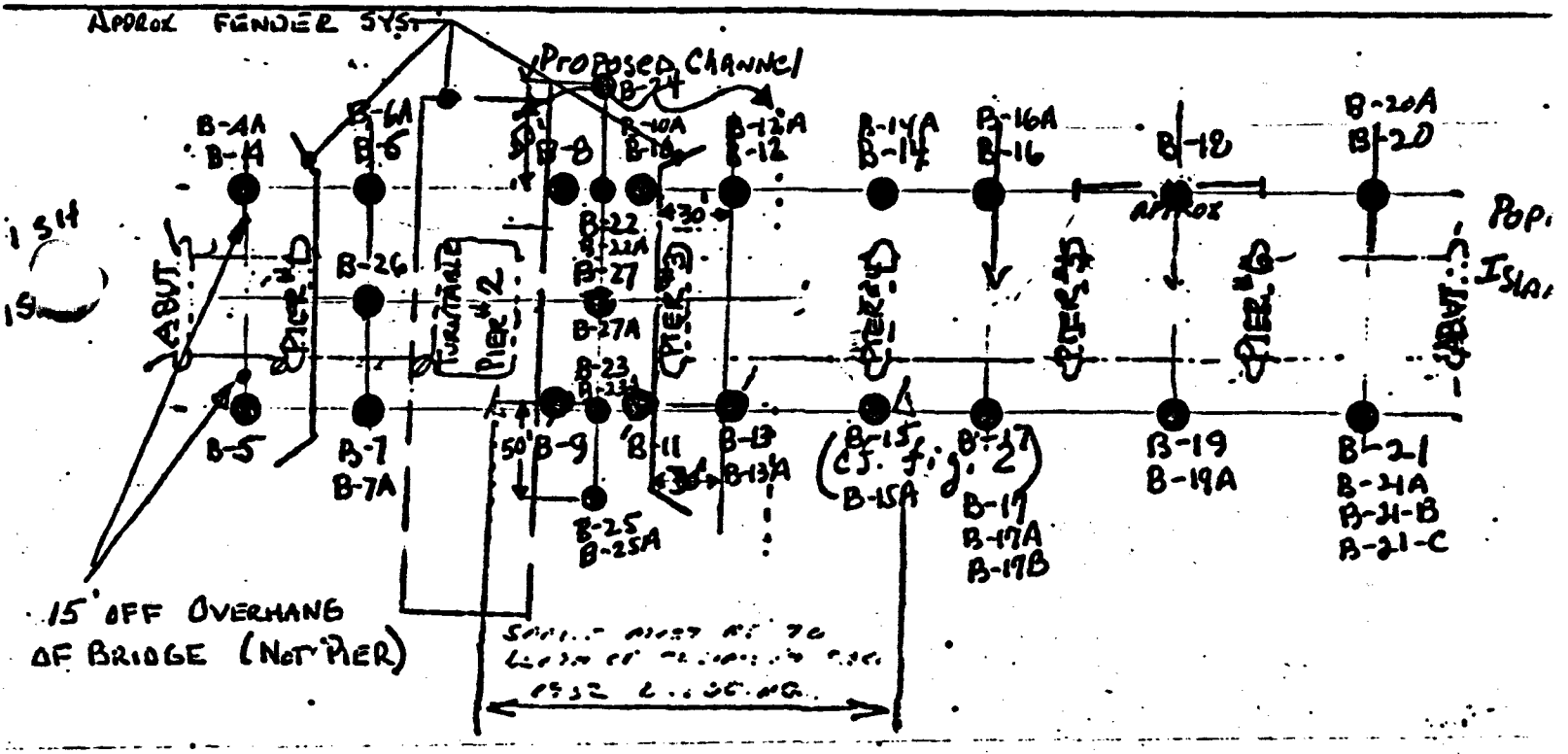
OS'N OF BRIDGE



FISH ISLAND

NEW BEDFORD

ACCESS Rd. (cf. fig. 3, bottom r. AND fig. 2)



AREA 1

(N.T.S.)

The attached two figures represent the sample locations and results of analyses conducted by DEQE for PCB concentrations found in the vicinity of the Route-6 bridge, New Bedford and Fairhaven.

Figure-1 is a representation of grab samples and five 12-inch to 15-inch core samples. Of the 25 samples analyzed four exceed 50 ppm total PCB; three of these were core samples.

Figure-2 depicts the location of the deep core samples obtained by the Massachusetts Department of Public Works. None of the 20 samples exceed 50 ppm total PCB. It is also evident that only trace amounts of PCB are found below two feet of the existing bottom.

Regarding the work involved with replacing the bridge; it appears that most of the PCB contamination is found between the New Bedford mainland and Fish Island. Assuming that four support piers are to be placed for a new access road at this location 4000 cubic yards of sediment will be displaced (with piers having dimensions 25 feet wide by 100 feet long by 12 feet deep). Assuming that two feet of this material is contaminated approximately 1000 cubic yards will need special handling.

Between Fish Island and Pope Island it is apparent that PCB concentrations are below 50 ppm. Dredging of a new navigation channel beneath the bridge requiring removal of sediments from an area 750 feet long, 140 feet wide, and 0 to 10 feet deep will yield 30,000 cubic yards of sediment of which 6000 cubic yards will be contaminated with PCB.

Richard Tomczyk

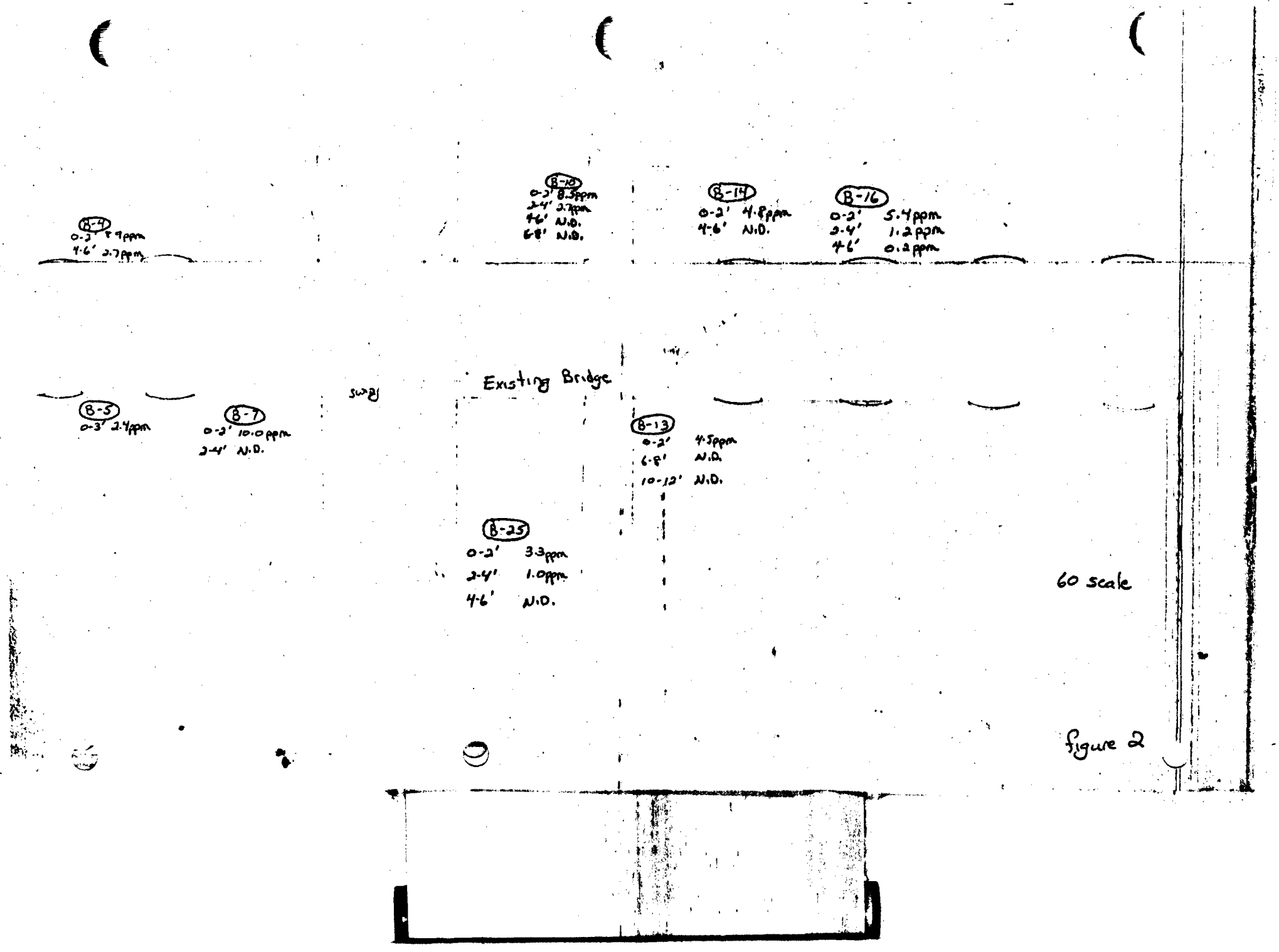
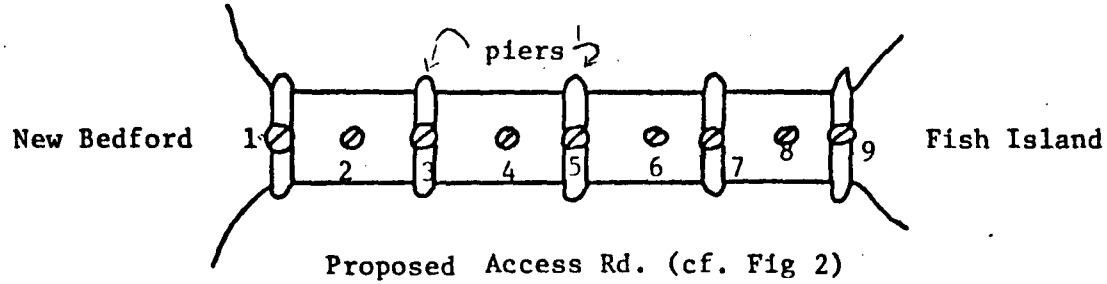
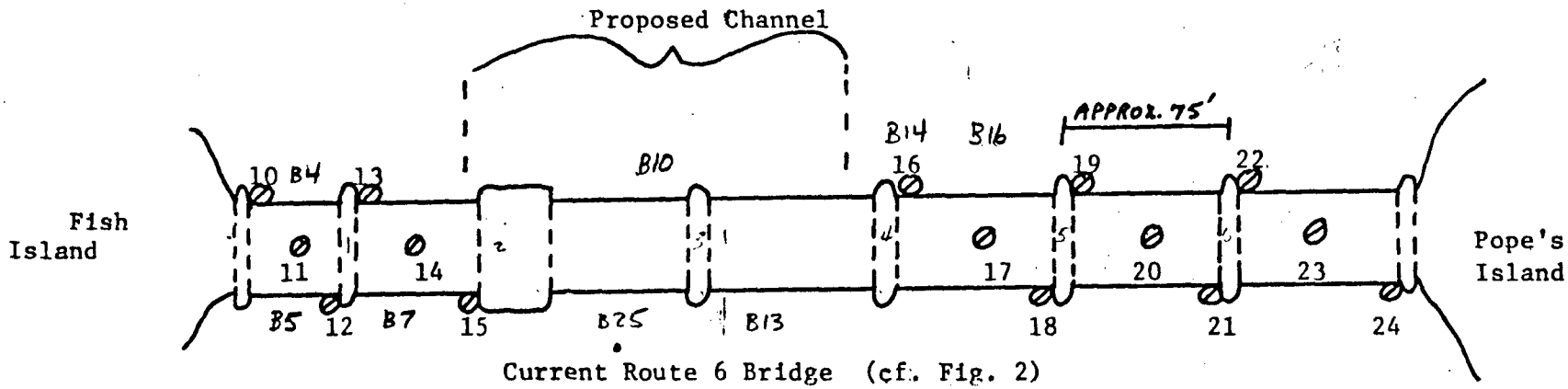

B-4
0-2' 2.9ppm
4-6' 2.7ppm
B-10
0-2' 8.3ppm
2-4' 2.7ppm
4-6' N.D.
6-8' N.D.
B-14
0-2' 4.8ppm
4-6' N.D.
B-16
0-2' 5.4ppm
2-4' 1.2ppm
4-6' 0.2ppm
Existing Bridge
B-5
0-3' 2.4ppm
B-7
0-2' 10.0ppm
2-4' N.D.
B-13
0-2' 4.5ppm
6-8' N.D.
10-12' N.D.
B-25
0-2' 3.3ppm
2-4' 1.0ppm
4-6' N.D.
60 scale

figure 2

Figure 1

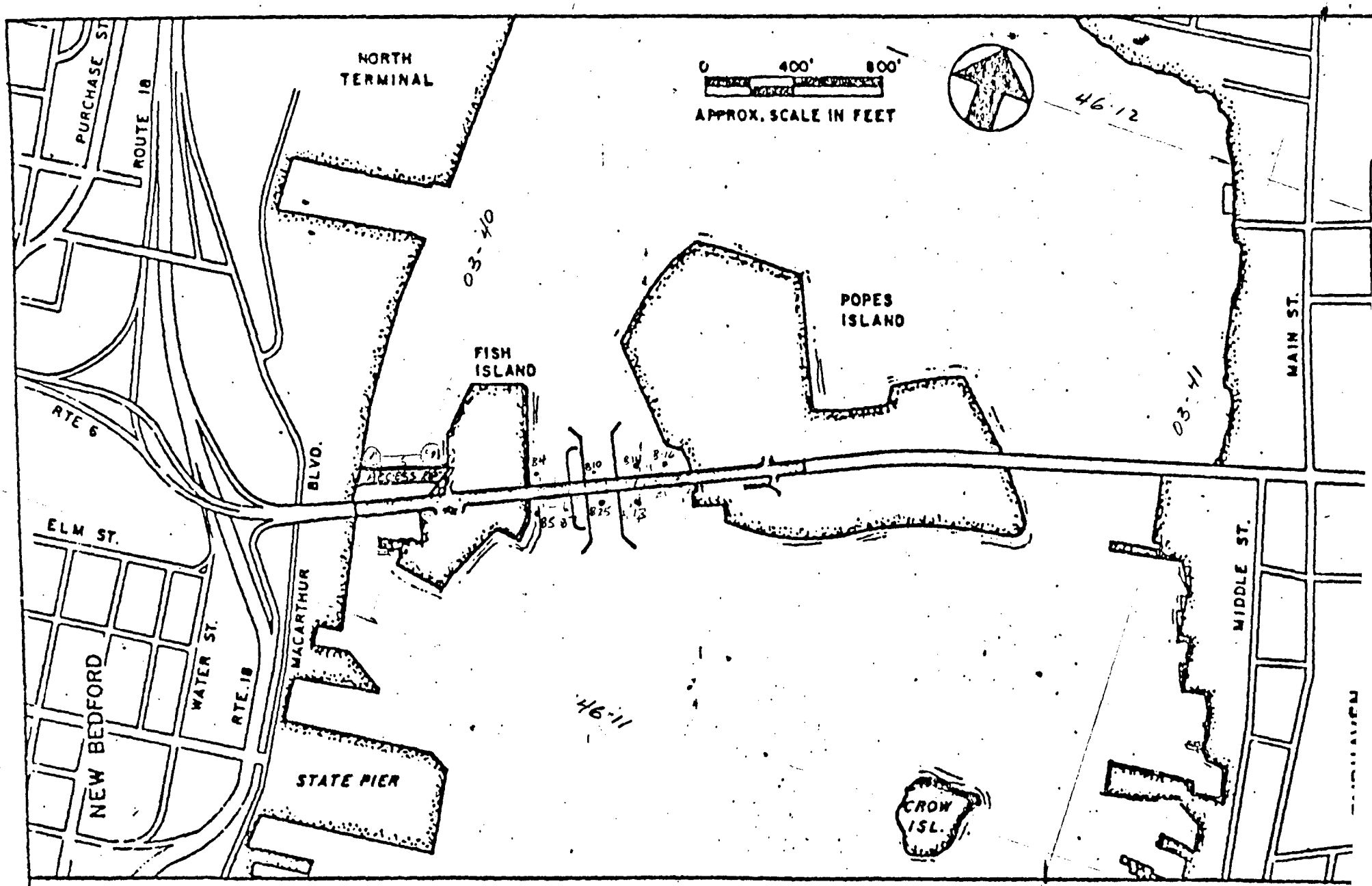


Proposed Access Rd. (cf. Fig 2)



Current Route 6 Bridge (cf. Fig. 2)

⌀ = sample location; Numbers refer to samples analyzed by Lawrence Lab (see attached report).



NEW BEDFORD-FAIRHAVEN BRIDGE

Figure 2.

The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
Department of Environmental Quality Engineering
Division of Water Pollution Control
One Winter Street, Boston 02108

ANTHONY D. CORTESE, Sc. D.
Commissioner

December 30, 1982

Ms. Lisa Eggleston
Metcalf and Eddy, Inc.
50 Staniford Street
Boston, Massachusetts 02114

Re: PCB Information
Data Retrieval System

Dear Ms. Eggleston:

Richard Tomczyk of my staff has compiled some of the information that is missing from the PCB data which is being transferred to the Data Retrieval System.

Dates of analysis for the sediment samples collected for the New Bedford-Fairhaven Bridge are May 7, 1982 for sample numbers 06254-06273, May 19, 1982 for sample numbers 06500-06505 and June 8, 1982 for 06579-06592. All of these analyses were conducted by the DEQE Lawrence Experiment Station.

In addition, I've enclosed a copy of the New Bedford Sewer Survey conducted by this Division during weeks of June 14 through June 25, 1982.

Please contact Richard Tomczyk at 292-5672 if you have any questions.

Very truly yours,

Thomas C. McMahon

Thomas C. McMahon
Director

TCM/RT/wp
Enclosure

F 114

STUDY REPORT

ACUSHNET RIVER ESTUARY PCB STUDY

PREPARED FOR

THE COMMONWEALTH OF MASSACHUSETTS
WATER RESOURCES COMMISSION
DIVISION OF WATER POLLUTION CONTROL
BOSTON, MASSACHUSETTS

SEPTEMBER 15, 1982

MALCOLM PIRNIE, INC.
WHITE PLAINS, NEW YORK

DRAFT

THE COMMONWEALTH OF MASSACHUSETTS
ACUSHNET RIVER ESTUARY PCB STUDY

SEPTEMBER 15, 1982

EXECUTIVE SUMMARY

Study Objectives

The objectives of this Study are:

a) to characterize the nature of the PCB contamination problem in the Acushnet River Estuary - New Bedford Harbor area and;

b) to evaluate alternative programs including both remedial dredging programs to recover PCB from the estuary and harbor in order to reduce environmental contamination and harbor dredging programs to relieve existing constraints on dredging for harbor improvement and development.

The study area is divided into five zones (see Figure 1-1):

Zone A:	Upper Acushnet River Estuary (above New Bedford-Fairhaven Bridge)
Zone B:	Inner New Bedford Harbor (above hurricane barrier)
Zone C:	Outer New Bedford Harbor
Zone D:	Inner Buzzards Bay
Zone E:	Outer Buzzards Bay

Basis of Study

Evaluations contained in this study are based upon available data and existing reports which are listed under References in Section 6. Recommendations were made by Malcolm Pirnie in April 1981 to obtain more extensive data in order to refine the present understanding of the nature and extent of PCB contamination and to provide for more reliable estimates

of remedial program costs. Since that time, additional sediment sampling, water column and lobster sampling has been undertaken, and the results are incorporated into this report.

This report presents evaluations which are judged to be suitable for making a decision as to whether feasible remedial or harbor improvement programs exist. The next phases of work would include additional sampling and detailed studies of all aspects of a selected program.

Nature and Extent of PCB Contamination

Available data indicate that the sediments and aquatic organisms in the Acushnet River-New Bedford Harbor area contain elevated levels of PCB. In the northern portion of the upper estuary (Zone A) sediment samples indicate levels generally exceeding 500 micrograms per gram (ug/g dry weight) with concentrations greater than 10,000 ug/g measured at several sampling stations. These sediment concentrations are the highest levels measured to date in the study area and are in the vicinity of a former PCB discharge point. Levels exceeding 50 ug/g are present in the estuary (Zone A) extending as far south as Pope's Island, in the northwest corner of the outer harbor (Zone C) and in the vicinity of the New Bedford Sewage Treatment Plant outfalls (Zone C). Concentrations of 10-50 ug/g occur in the peripheral areas of the inner harbor (Zone B) with lower sediment values in the navigation channel. An additional area containing PCB in the 10-50 ug/g range is located along the west shore of the outer harbor (Zone C) near another former PCB discharge point. Areas of sediment PCB contamination have been outlined on Plate 6 on the basis of available data.

Aquatic organisms exhibit the highest PCB levels in the estuary and inner harbor area and decreasing levels seaward. A majority of the finfish sampled in the inner harbor (Zone B) have had PCB levels exceeding the FDA limit of 5 ug/g wet

weight. Lobster samples from the inner bay (Zone D), within the fishery closure area, show PCB levels fluctuating around 5 ug/g and exceeding this level in a significant portion of the samples on a seasonal basis.

It is recommended that sampling be continued in the Acushnet River-New Bedford Harbor area to supplement existing information.

Dredging Volumes

Several current studies of PCB-contaminated waterways have shown removal of contaminated material as the only technically and economically feasible remedial action.[12,26] Estimates of contaminated bed material volumes in the Acushnet River-New Bedford Harbor area are based on a depth of removal of three feet in areas dredged. Dredged material volumes for Inner and Outer Harbor dredging alternatives (Zones A, B and C) are indicated in Table S-1. Brief statements describing the basis of estimates contained in Table S-1 are given in footnotes to the table. More detailed information is provided in Section 3.

Conceptual Dredging Programs

The benefits to be expected from dredging programs are related to two primary issues involved:

- o reduction in PCB levels in aquatic life generally, and specifically in organisms of commercial and sport fishing importance.
- o lifting of constraints on harbor development projects.

Reductions in PCB contamination levels in aquatic organisms will be related to, among other factors, the extent to which PCB-contaminated bed materials are removed, the effects of this removal on PCB levels in the water column, and the levels of PCB in the remaining undredged harbor areas.

TABLE S-1

PCB-CONTAMINATED VOLUMES

Based on Available Data

Project	Typical PCB Concentration in Dredged Area ug/g	Cumulative Volume of Dredged Material cu yds
REMEDIAL DREDGING PROJECTS		
Hot Spots I	>500[1]	70,000
Hot Spots II	> 50[2]	2,200,000
Hot Spots III	> 10[2]	4,400,000
HARBOR DEVELOPMENT PROJECTS		
Project A: Channel Improvement Dredging	~ 10[3]	80,000
Project B: Proj. A + Bridge Excavation	~ 10[3]	120,000
Project C: Proj. B + Small Scale Harbor Development	~ 10[3]	300,000
Project D: Proj. C + Large Scale Harbor Development	~ 10[3]	900,000

(1) PCB concentration based on measured PCB values in top two feet of sediment.
(2) PCB concentrations based on surface samples (~0-4" depth) only, due to insufficient data at greater depths.
(3) Approximate concentrations based on minimal sampling; must be verified with detailed sampling on a site-by-site basis.

The various factors which must be considered in evaluating the potential for PCB reductions in aquatic organisms are discussed in Section 3 of this report. A discussion of the possible benefits to aquatic life in the Acushnet River Estuary-New Bedford Harbor area as the result of remedial dredging programs is presented in Section 4.

Constraints on harbor development projects would be reduced by the provision of containment sites for the PCB-contaminated fraction of the bottom muds in areas being considered for channel improvement dredging and various construction projects.

Five remedial dredging program alternatives have been formulated:

1. Dredge sediments containing greater than 500 ug/g PCB with disposal at a secure upland site. (Hot Spot I Project).

2. Dredge sediments containing greater than 50 ug/g with disposal at a secure upland site. (Hot Spot II Project).

3. Dredge sediments containing greater than 10 ug/g PCB with disposal of sediments containing 50 ug/g PCB or greater at a secure upland site, and shoreline disposal of sediment containing less than 50 ug/g. (Hot Spot III Project).

4. Allow implementation of channel improvement dredging, bridge excavation and initiation of small scale harbor development projects through removal and shoreline containment of the PCB-contaminated bed material volumes involved. (Harbor Development Project C).

5. Allow implementation of channel improvement dredging, bridge excavation and initiation of larger-scale harbor development projects through removal and shoreline containment of the PCB-contaminated bed materials volumes involved. (Harbor Development Project D).

Dredged Material Containment Sites

TSCA (Toxic Substances Control Act) regulations presently require secure upland disposal in a chemical waste landfill for sediments having PCB concentrations equal to or greater than 50 ug/g. Sediments with PCB concentrations less than 50 ug/g are not currently regulated by TSCA. As a basis for developing the costs of various alternatives in this report, it was therefore assumed that sediments containing PCB concentrations equal to or greater than 50 ug/g would be disposed of at a secure upland landfill. For alternatives involving sediment containing PCB concentration less than 50 ug/g, shoreline containment has been assumed.

A preliminary review of the soils within a five-mile radius of New Bedford Harbor indicates that a limited number of acceptable sites for secure upland disposal may exist in the area. A site investigation study will be required if potential upland disposal sites are to be identified.

Two available reports have presented evaluations of potential containment sites for dredged material with less than 50 ug/g PCB.[24,25] Two site categories are of interest:

a) Sites which are suitable for disposal of contaminated harbor muds and which are not needed for harbor facilities.

b) Sites desirable for harbor development which need both structurally sound fill and containment areas for less structurally sound contaminated material removed during site development.

Sites identified in the two reports are shown on Plate 4. A review of possible contaminated dredged volumes and a comparison with identified containment areas suggests that available sites may limit otherwise feasible dredging programs. Further evaluation of these shoreline sites and other possible shoreline disposal options may be required.

Characterization of each of the five alternative programs and associated costs are indicated in Table S-2.

TABLE S-2

CONCEPTUAL DREDGING PROGRAMS

(1981 Dollars)

Alternative	Dredged Material Volumes, Cu.Yds. Remedial Program	Harbor Development Program	Cost $ Millions
1. Dredging and secure containment containing PCB concentration >500 ug/g (Hot Spots I)	70,000	-	5-10
2. Dredge and secure containment of sediments containing PCB concentration >50 ug/g (Hot Spots II)	2,200,000	-	60-70
3. Dredging and containment of sediment with PCB concentration >10 ug/g. Sediment containing PCB concentration equal to 50 ug/g or greater will be contained at a secure upland site. Sediments containing PCB concentrations <50 ug/g will be handled in shoreline disposal areas. (Hot Spots III)	4,400,000		110
4. Initiation of Small Scale Harbor Development (Harbor Development Project C)	-	300,000	15
5. Initiation of Large Scale Harbor Development (Harbor Development Project D)	-	900,000	25

Notes:

Initiation of harbor development projects refers to removal of 3 ft. of harbor muds at sites to be developed.

Small-scale harbor development includes channel improvement dredging, bridge excavation and 35 acres of new harbor development area.

Large-scale harbor development includes channel improvement dredging, bridge excavation and 170 acres of new harbor development area.

Remedial dredging program costs are based on assumptions listed in Section 4 and represent only order of magnitude estimates.

Combinations of the five alternative programs could be implemented to provide for varying degrees of PCB recovery harbor development. Order of magnitude costs may be developed from the information in Table 4-2.

Conclusions and Recommendations

1. Available sediment data indicates that high levels of PCB (greater than 50 ug/g) exist throughout much of the Acushnet River Estuary and in portions of the outer harbor. In the northern tip of the estuary, levels generally exceed 500 ug/g with concentrations greater than 10,000 ug/g indicated at several sampling stations.

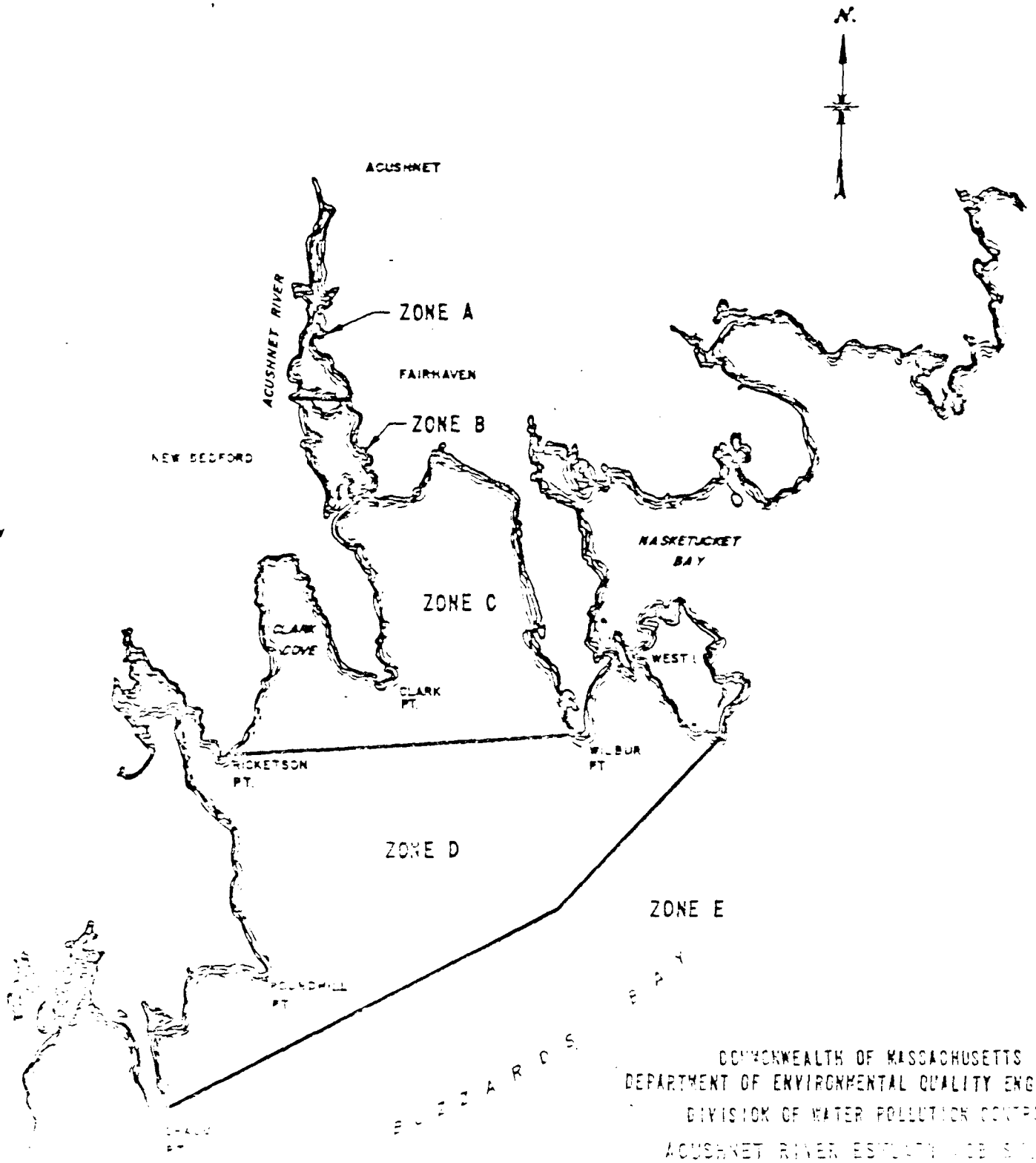
2. Remedial dredging programs to recover PCB contaminated sediments are technically feasible. The order of magnitude costs given in this report must be compared to anticipated benefits to determine economic feasibility.

3. A phased remedial dredging program should be implemented if economically feasible. The first stage of the program should include removal of the most contaminated sediments. The extent of the initial dredging program will depend on the availability of both funding and a suitable disposal site with sufficient capacity. After completion of the first stage of remedial dredging, a detailed monitoring program of water column and biota PCB levels should be implemented to determine the actual effects of the dredging program. The need for further dredging can then be evaluated.

4. A remedial dredging program to remove the areas of greatest PCB contamination will probably reduce PCB levels in the water column and in aquatic organisms; however, a quantitative estimate of the extent of PCB reduction in species of commercial and recreational value cannot be made without additional study of PCB transport and uptake.

5. Harbor development programs can be undertaken separately or in conjunction with remedial dredging programs. Separate harbor development programs will require detailed sampling studies to determine whether all sediments are less than 50 ug/g PCB and can be disposed of in a shoreline site. If sediments are found to contain PCB concentrations equal to or greater than 50 ug/g, a secure upland disposal site will be required.

FIGURE 1-1



COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERI
DIVISION OF WATER POLLUTION CONTROL
ACUSHNET RIVER ESTUARY [illegible] STUDY
STUDY AREA ZONES
1982

Received
8/26/82

RESULTS OF SEDIMENTATION TEST ON SEDIMENT FROM THE ACUSHNET RIVER ESTUARY

Prepared for:

Geotechnical Engineers, Inc.
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August 1982

TABLE OF CONTENTS

1. INTRODUCTION

This report presents results of sedimentation tests performed on a composite sediment sample collected from the Acushnet River estuary. Analytical methods are summarized in the second section of the report, while results are presented in the third section. References cited in the report are contained in the final section.

2. ANALYTICAL METHODS

Sedimentation tests were conducted on a composite sediment sample which was composed of equal amounts of sediment from the seven stations sampled by ERCO on July 13, 1982 (Figure 1). Analyses were performed according to methods outlined in Appendix A of U.S. COE (1978). A 6-foot column was filled with artificial seawater (30 $^{o}/_{oo}$ salinity) and sediment was added to attain an initial concentration of 38.5 g/l. After homogenization of the sample, settling was allowed to occur and samples were withdrawn from depths of 1, 2, and 3 ft below the top of the column at time intervals of 0, 0.5, 1, 2, 3, 4, 9, 12, 22, and 26 hr after initiation of settling. Concentrations of suspended solids were determined by collection of the material in tared Gooch crucibles, rinsing with distilled water to remove dissolved salts, and drying to a constant weight at 103-105°C.

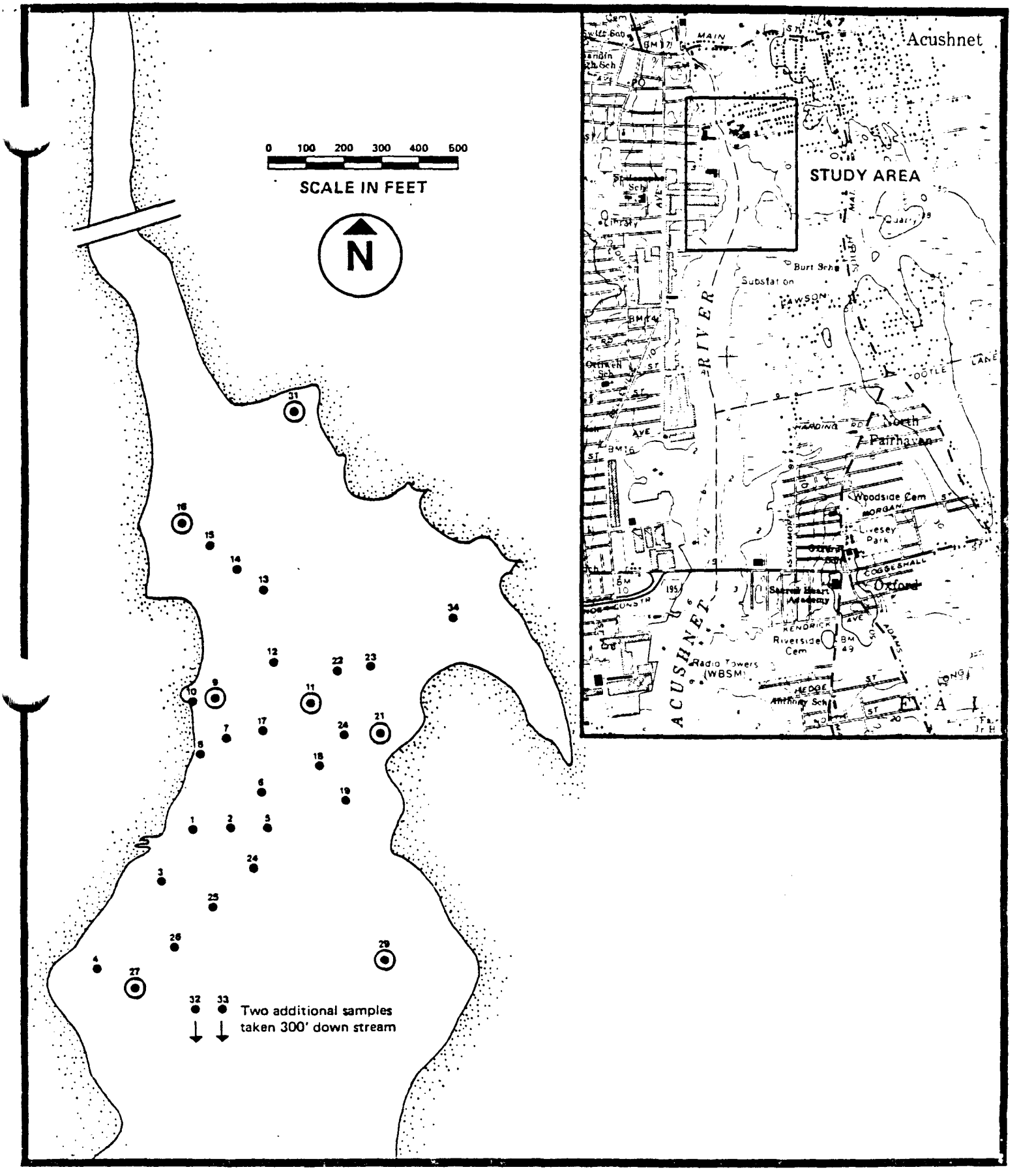

Figure 1. Location of sampling stations in Acushnet River. Stations denoted as ● were occupied by U.S. Coast Guard in April, 1982. Stations denoted as ⊙ were reoccupied by ERCO on July 13, 1982.

3. RESULTS

Observed settling concentrations as a function of time are presented in Table 1. The percentage of the initial suspended solids concentration as a function of time was calculated from these data and is shown in Table 2.

Table 2.—Percentage of initial concentration as a function of time

Time (hr)	Depth (ft) from top of column		
	1	2	3
0	100	100	100
0.5	1.4	3.6	161
1	1.4	1.2	13.7
2	1.2	0.8	0.7
3	0.6	0.7	0.4
4	0.4	0.4	0.3
9	0.4	0.34	0.3
12	0.2	0.1	0.1
22	0.3	0.1	0.2
26	0.2	0.2	0.1

Table 1.—Results of sedimentation test of composite sediment sample from the Acushnet River estuary: suspended solids (mg/l)

Time (hr)	Depth (ft) from top of column		
	1	2	3
0	38,500	38,500	38,500
1	555	1,375	61,942
2	522	470	5,275
3	465	298	271
4	145	150	115
9	150	132	129
12	91	53	51
22	109	59	68
26	98	82	41

4. REFERENCES

U.S. Army Corps of Engineers. 1978. Guidelines for designing, operating, and managing dredged material containment areas. Technical Report DS-78-10. U.S. Army Engineer Waterways Experiment Station Environmental Laboratory, Vicksburg, Missippippi 39180.

THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING

SPECIAL ANALYSIS

MAR 20 1981

SOURCE A S.T.P. Influent, 4 hr. composite (301-ch)
SOURCE B " " " " "
SOURCE C " Effluent " " "
SOURCE D " " " " "
SOURCE E Tap water-lab. of S.T.P., Grab
SOURCE F S.T.P. centrate, Grab

CITY/TOWN NEW BEDFORD
COLLECTOR J. Ackerman

	A	B	C	D	E	F
SAMPLE NUMBER	003669	003670	003671	003672	003674	003673
DATE OF COLLECTION	2/25/81	2/26/81	2/26/81	2/25/81	2/25/81	2/26/81
DATE OF RECEIPT	2/26/81	2/27/81	2/27/81	2/25/81	2/25/81	2/27/81
DATE ANALYZED	2/28/81	2/28/81	3/1/81	3/1/81	3/1/81	3/1/81
PCB as ARCHLOR #1016 ug/l	N.D.*	N.D.	N.D.	N.D.	N.D.	N.D.
PCB as AROCHLOR #1254 ug/l	7.61	N. D.	N. D.	N. D.	N. D.	N. D.

REMARKS * N. D. = None Detected

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DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING

SPECIAL ANALYSIS

MAR 20 1981

SOURCE A S. T. P. effluent, 4 hr. composite
SOURCE B S. T. P. influent, " "
SOURCE C Sewer above aerovox-grab
SOURCE D " below " - grab
SOURCE E " below Cornell-Dublier, new station-grab
SOURCE F " above " " , grab

CITY/TOWN NEW BEDFORD
COLLECTOR J. Ackerman

	A	B	C	D	E	F
SAMPLE NUMBER	003679	003680	003681	003682	003683	003684
DATE OF COLLECTION	3/2/81	3/2/81	3/2/81	3/2/81	3/2/81	3/2/81
DATE OF RECEIPT	3/2/81	3/2/81	3/2/81	3/2/81	3/2/81	3/2/81
DATE ANALYZED	3/6/81	3/6/81	3/7/81	3/7/81	3/7/81	3/8/81
ug/l PCB as AROCHLOR #1016	N. D.*	N. D.	N. D.	N. D.	63.3	N. D.
ug/l PCB as AROCHLOR #1254	N. D.	N. D.	N. D.	N. D.	55.5	N. D.

REMARKS * N. D. = None Detected

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DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING

SPECIAL ANALYSIS

MAR 20 1981

SOURCE A Sewer below Cornell-Dublier
SOURCE B Centrifuge Centrate
SOURCE C S.T.P. Centrate, grab 301 (h)
SOURCE D W.W.T.P. Effluent, composite 301 (h)
SOURCE E W.W.T.P. influent " "
SOURCE F S.T.P. Influent " "

CITY/TOWN NEW BEDFORD
COLLECTOR J. Ackerman

	A	B	C	D	E	F
SAMPLE NUMBER	003685	003686	003711	003712	003713	003727
DATE OF COLLECTION	3/2/81	3/2/81	3/3/81	3/3/81	3/3/81	3/4/81
DATE OF RECEIPT	3/2/81	3/2/81	3/4/81	3/4/81	3/4/81	3/5/81
DATE ANALYZED	3/8/81	3/8/81	3/8/81	3/8/81	3/8/81	3/13/81
ug/l PCB as AROCHLOR #1016	36.8	N. D.*	N. D.	N. D.	N. D.	N. D.
ug/l PCB as AROCHLOR #1254	14.2	N. D.	N. D.	N. D.	N. D.	N. D.
	021	01	011	01		

REMARKS * N. D. = None Detected

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DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING

SPECIAL ANALYSIS

MAR 20 1981

SOURCE A Sludge
SOURCE B S.T.P. sludge
SOURCE C S.T.P. sludge
SOURCE D S.T.P. sludge
SOURCE E
SOURCE F

CITY/TOWN NEW BEDFORD
COLLECTOR J. Ackerman

	A	B	C	D	E	F
SAMPLE NUMBER	003687	003714	003737	003738		
DATE OF COLLECTION	3/2/81	3/3/81	3/3/81	3/4/81		
DATE OF RECEIPT	3/2/81	3/5/81	3/5/81	3/5/81		
DATE ANALYZED	3/15/81	3/15/81	3/15/81	3/15/81		
ug/kg PCB as AROCHLOR #1016	609	165	173	117		
ug/kg PCB as AROCHLOR 1254	407	16	N. D.	25		
	1 1 L.	1 0 1 4	9 0 1	1 0 1		

REMARKS Dry wt basis

THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING

SPECIAL ANALYSIS

MAR 20 1981

SOURCE A S.T.P. effluent, composite - 301 (H)
SOURCE B S.T.P. Centrate-grab, 301 (H)
SOURCE C S.T.P. Influent-composite, 301 (H)
SOURCE D " Effluent-Composite, 301 (H)
SOURCE E " Incinerator Ash-grab
SOURCE F Dewatered study before incineration-grab

CITY/TOWN NEW BEDFORD
COLLECTOR J. Ackerman

	A	B	C	D	E	F
SAMPLE NUMBER	003728	003729	003730	003731	003676	003777
DATE OF COLLECTION	3/4/81	3/4/81	3/5/81	3/5/81	2/26/81	~~2/6/81~~
DATE OF RECEIPT	3/5/81	3/5/81	3/5/81	3/5/81	2/27/81	2/27/81
DATE ANALYZED	3/13/81	3/14/81	3/14/81	3/14/81	3/15/81	3/15/81
ug/l PCB as AROCHLOR #1016	N. D.*	N. D.	N. D.	N. D.	N. D.	114 ug/kg *
ug/l PCB as AROCHLOR #1254	N. D.	N. D.	N. D.	N. D.	N. D.	N. D.

REMARKS * N. D. = None Detected

* dry wt. basis

The Commonwealth of Massachusetts

Department of Environmental Quality Engineering

Special Analysis

Market Samples

Collector: Food & Drug

Source A WH-111 (Unknown)

Source B WH-112, Quahog

Source C WH-113, "

Source D WH-115, EEL

Source E WH-116, Quahog

Source F WH-117, "

	A	B	C	D	E	F
Sample No.	540729	730	731	732	733	734
Date of Collection						
Date of Receipt						
Date of Analysis	12/17/76					
PCB as 1254 (ppm)	0.38	0.30	0.63	0.95	1.41	1.08
M+E No.	105	106	107	108	109	110

REMARKS: Coordinated study of methodology & analysis by analysts from the Lawrence Experiment Station - D.E.Q.E., Food and Drug and Cat Cove, Marine Fisheries.

The Commonwealth of Massachusetts

Department of Environmental Quality Engineering

Special Analysis

Collector: _____

Source A WH-118, Fish

Source B WH-119, Quahog

Source C WH-120, Lobster

Source D WH-121, "

Source E WH-122, "

Source F WH-123, "

	A	B	C	D	E	F
Sample No.	540735	736	737	738	739	740
Date of Collection						
Date of Receipt						
Date of Analysis	12/20/76					
PCB as 1254 (ppm)	< 0.1	0.39	0.21	1.12	0.32	< 0.1
Lab No.	110	112	111	113	114	115

REMARKS:

The Commonwealth of Massachusetts

Department of Environmental Quality Engineering

Special Analysis

Collector: _____

Source A WH-118, Fish

Source B WH-127, "

Source C WH-128, "

Source D WH-129, "

Source E Water Sample "A" & "B"

Source F Boston Harbor, Smelt

	A	B	C	D	E	F
Sample No.	540741	742	743	744	745	747
Date of Collection						
Date of Receipt						
Date of Analysis	12/21/76					
PCB as 1254 (ppm)	< 0.1	0.76	0.21	0.1	< 0.1 Both	8.9
114 N.		117	118	119	120	121

REMARKS:

The Commonwealth of Massachusetts

Department of Environmental Quality Engineering

Special Analysis

New Bedford

Collector: Packard

Source A — New Bedford Harbor Sediments, Station #7 - (Top 0"-4")

Source B — " " " " " #7 - (Bot 4"-8")

Source C — " " " " " #8 - (Top 0"-3")

Source D — " " " " " #8 - (Bot 3"-6")

Source E — " " " " " #9 - (Top 0"-4")

Source F — " " " " " #9 - (Mid 4"-7")

	A	B	C	D	E	F
mple No.	545667	668	669	670	671	672
Date of Collection	5-8-78					
Date of Receipt	5-10-78					
PCB'S as 1254 mg/kg dry wgt. basis	20.4	31.6	19.9	14.3	13.1	13.7

REMARKS: Samples extracted and analyzed 5/10/78 and 6/2/78

The Commonwealth of Massachusetts

Department of Environmental Quality Engineering

Special Analysis

New Bedford

Collector: Packard

Source A New Bedford Harbor, Sediment, Station #9 (Bot. 7" - 10"

Source B " " " " " #10 (Top 0" - 4"

Source C " " " " " #11 (Top 0" - 3"

Source D " " " " " #11 (Bot. 3" - 6"

Source E " " " " " #12 (Top 0" - 3"

Source F " " " " " #12 (Bot. 3" - 6"

	A	B	C	D	E	F
Sample No.	545673	674	675	676	677	678
Date of Collection	3/8/78					
Date of Receipt	5/10/78					
PCB's as 1254 mg/kg Dry Wgt. Basis	29.8	2.4	4.9	4.0	3.3	7.4

REMARKS:

The Commonwealth of Massachusetts

Department of Environmental Quality Engineering

Special Analysis

New Bedford

Collector: Packard

Source A New Bedford Harbor, Sediment, Station #13 (Top 0" - 5"

Source B " " " " " #13 (Bot 5" - 8"

Source C " " " " " #14 (Top 0" - 4"

Source D " " " " " #14 (Bot 4" - 6"

Source E " " " " " #17 (Top 0" - 3"

Source F " " " " " #19 (Top 0" - 2"

	A	B	C	D	E	F
ple No.	545679	680	681	682	683	684
Date of Collection	5/8/78					
Date of Receipt	5/10/78					
PCB's as 1254 mg/kg Dry Wgt. Basis	12.0	5.2	1.8	3.6	7.9	7.4

REMARKS:

The Commonwealth of Massachusetts

Department of Environmental Quality Engineering

Special Analysis

New Bedford

Collector: ~~Packard & Dupheneo~~

Source A New Bedford Harbor Sediments, Station #20 (Top 0"-2")

Source B " " " " " #22 (Top 0"-11/2')

Source C " " " " " #22A (Top 0"-4")

Source D " " " " " #22A (Bot 4"-8")

Source E " " " " " #23 (Top 0"-2")

Source F " " " " " #1 (Top 0"-4")

	A	B	C	D	E	F
Sample No.	545685	686	687	688	689	773
Date of Collection	5-8-78					5-10-78
Date of Receipt	5-10-78					5-10-78
PCB'S as 1254 mg/kg dry wgt. basis	5.2	7.2	6.8	8.4	0.4	7.4
[illegible]	40[illegible]	40[illegible]	40[illegible]	[illegible]	41	

REMARKS:

The Commonwealth of Massachusetts

Department of Environmental Quality Engineering

Special Analysis

New Bedford

Packard & Orphanos

Collector:

Source A — New Bedford Harbor, Sediments, Station #1 (Bot 4"-8")

Source B — " " " " " #1A (Top 0"-3")

Source C — " " " " " #1A (Bot 3"-6")

Source D — " " " " " #2 (Top 0"-3")

Source E — " " " " " #2 (Bot 3"-6")

Source F — " " " " " #3 (Top 0"-3")

	A	B	C	D	E	F
Sample No.	545734	735	736	737	738	739
Date of Collection	5-10-78					
Date of Receipt	5-10-78					
~~PCB'S as 1254 mg/kg~~ dry wgt basis	10.4	~~none~~ detected	~~none~~ detected	1.9	3.9	2.5

REMARKS:

The Commonwealth of Massachusetts

Department of Environmental Quality Engineering

Special Analysis

New Bedford

Packard & Orphanos

Collector: _____

Source A New Bedford Harbor Sediments, Station #3 (Bot 3"-6")

Source B " " " " " #4 (Top 0"-3")

Source C " " " " " #4 (Bot 3"-6")

Source D " " " " " #5 (Top 0"-4")

Source E " " " " " #5 (Bot 4"-8")

Source F " " " " " #1 (Top 0"-4")

	A	B	C	D	E	F
ample No.	545740	741	742	743	744	745
Date of Collection	5-10-78					
Date of Receipt	5-10-78					
PCB'S as 1254 mg/kg dry wgt. basis	4.7	6.3	2.9	3.4	8.3	4.2
11-3 11	13	31				

REMARKS:

The Commonwealth of Massachusetts

Department of Environmental Quality Engineering

Special Analysis

New Bedford

Collector: Packard & Orphanos

Source A New Bedford Harbor Sediments, Station #6 (Bot 4"-8")

Source B " " " " " #12A (Top 0"-4")

Source C " " " " " #12A (Bot 4"-8")

Source D " " " " " #15 (Top 0"-3")

Source E " " " " " #15 (Bot 3"-6")

Source F " " " " " #16 (Top 0"-5")

	A	B	C	D	E	F
Sample No.	545746	747	748	749	750	751
Date of Collection	5-10-78					
Date of Receipt	5-10-78					
PCB'S as 1254 mg/kg dry Wgt. basis	5.1	6.8	12.7	7.1	7.2	9.7

REMARKS:

DEPARTMENT OF TRANSPORTATION
U. S. COAST GUARD
CG-3883 (Rev. 5-77)

RAPIDRAFT LETTER

MAY BE TYPED OR HANDWRITTEN

INSTRUCTIONS

ORIGINATOR – Use for routine correspondence not requiring action, review, or comment by officers in the chain of command. Send original and blue copy to addressee. Retain yellow copy for file.

ADDRESSEE – Reply hereon, returning original to originator. Retain blue copy for file.

TO:

- METCALF & EDDY
  54 STANIFORD ST.
  BOSTON MA.
  02114

STAFF SYMBOL/SSIC NO.

16460

DATE

27 DEC 82

ATTN: MR. ARTHUR MICHELINI

AS PER OUR TELEPHONE CONVERSATION ON 24 DEC 82, PLEASE FIND THE INFORMATION YOU REQUESTED ENCLOSED. WE WILL FORWARD ANY OTHER INFORMATION AS WE OBTAIN IT. IF WE CAN BE OF ANY FURTHER ASSISTANCE, PLEASE DO NOT HESITATE TO CALL.

Ted Huntington
LTJG USCG

FROM:

- CAPTAIN OF THE PORT
  U. S. COAST GUARD
  FEDERAL BUILDING & USPO
  EXCHANGE STREET
  PROVIDENCE, R.I. 02903

DO NOT USE FOR CLASSIFIED CORRESPONDENCE

PREVIOUS EDITIONS ARE OBSOLETE
SN-7530-00-FO1-5310

The Commonwealth of Massachusetts

Department of Environmental Quality Engineering

Special Analysis

New Bedford

Collector: Packard & Orphanos

Source A New Bedford Harbor Sediments, Station #16 (Dot. 5"-10")

Source B

Source C

Source D

Source E

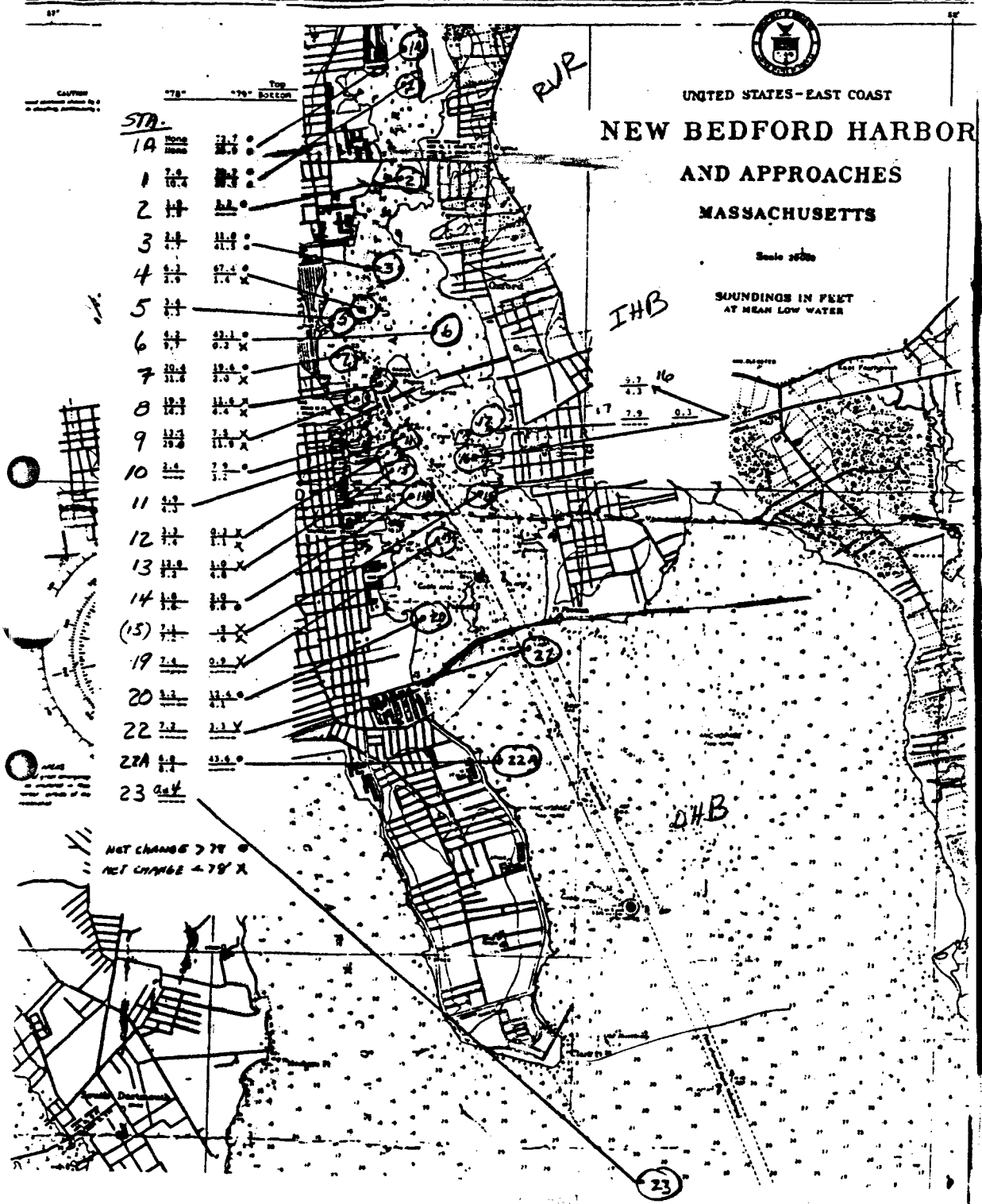
Source F

	A	B	C	D	E	F
Sample No.	545752					
Date of Collection	5-10-78					
Date of Receipt	5-10-78					
PCB'S as 1254 mg/kg dry wgt basis	4.3					

REMARKS:

123

1 SEDIMENT DATA



Kf # 124

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

EDISON, NEW JERSEY 08837

August 18, 1982

Captain George Ireland, On-Scene Coordinator
Captain Of The Port - Providence
John O. Pastore Federal Bldg.
Providence, Rhode Island 02903

Dear Captain Ireland,

Attached is a draft scope of work for the three month study discussed in the RRT meeting of August 4, 1982. The scope will investigate the migration of PCB's from the Upper Harbor to Lower New Bedford harbor and approximates the level of effort needed to perform the tasks within the time frame needed to meet the late October target date.

Our goal is to utilize as many existing public agency resources as necessary to accomplish the tasks, the bulk of the effort will be shared by EPA and the Coast Guard, with some support from the outside e.g., ERT's operating contractor to provide logistical support for conducting the tidal cycle studies etc.

Once we receive the feedback we want regarding the technicalities of the study we then can fine tune our proposed efforts. We should conduct the field studies in early September immediately followed by the laboratory effort in order that the chemists be given enough time to perform the PCB and associated analyses.

We should plan to meet to discuss this proposal as soon as possible, especially if the Coast Guard R&D laboratory can perform the laboratory study plus the chemical analyses.

We should try to coordinate our efforts with EPA Region I's Air Monitoring survey proposed for this site.

Sincerely,

Royal J. Nadeau, Ph.D.
Acting Chief
Environmental Impact Section

cc:Ken Biglane - Hazardous Response Support Division
Gerald Sotolongo - Superfund Program-Region I
Ed Conley - Environmental Services Division-Region I

ENCLOSURE (44a)

SCOPE OF WORK

PCB'S IN UPPER NEW BEDFORD HARBOR
NEW BEDFORD, MASSACHUSETTS

BACKGROUND

At the last Coastal Regional Response Team meeting (USCG District I Office, August 4th, 1982) Captain George Ireland (COTP-Providence) presented data from the latest sampling effort in the Acushnet River in the area adjacent to the Aerovox property.

The results of the sediment analyses indicate the presence of high concentrations of PCB's throughout the sampling area (>1,000 ppm) and extremely high concentrations (>10,000 ppm) in the area directly adjacent to Aerovox.

The levels in the sediments were so high that the RRT felt that the immediate action status should be maintained until further information could be developed for deciding future actions for the site.

A main concern of the RRT was that PCB's may be leaching out of these sediments at such a rate as to create and maintain a threat to the water quality of New Bedford Harbor and Buzzards Bay.

RECOMMENDATION

The RRT recommended that a short term study (no longer than three months) be conducted to determine:

(1) A partition coefficient for PCB's being released from the surface of the contaminated sediments into the overlying waters.

(2) A net movement, if any, of PCB from the highly contaminated sediments in the upper harbor to the lower harbor area.

The results of these studies could then be used in the longer term studies being funded by EPA to be initiated later in the fall for characterizing the circulation and sediment transport pattern within New Bedford Harbor and Buzzards Bay.

APPROACH

A two pronged approach is most appropriate for generating data for addressing the objective set forth above.

ENCLOSURE (44b)

LABORATORY STUDY

The purpose of this study is to characterize the phenomenon of PCB's being released by the sediments to the incoming water of each tide. This will require the generation of a partition coefficient for intact samples collected along a gradient of ambient level to highly contaminated sediments. This coefficient can then be used to characterize the release rate of PCB's to the over-lying water as described in Branson (1978).* Only the uppermost layer of sediments will be used for these tests as this is the layer that will most likely be contributing the PCB's to the water column.

A worst case leaching test will be performed using a test procedure similiar to the one developed for the Section 103 permit program for discharging dredged materials (see Attachment A). This procedure involves complete mixing of sediment in water and would be representative of what possibly might occur within the top layer of sediments during periods of high flow e.g., after-storm event.

Another test representative of more quiescent, low turbulence conditions should be performed using large diameter contaminated soil cores. In this test, precautions will be taken to avoid radical disturbance of sediments while adding sea water to the test containers.

FIELD STUDIES

Dr. David Bella (Marine Division-ORD, Corvallis), after a site visit (August 5th) recommended that samples be collected during a tidal cycle to determine net movement of PCB's from the upper harbor area. This could be accomplished by monitoring the water column at the Mullins Bridge for PCB transport. Large detrital materials would also be sampled for PCB content.

Flow measurements coupled with tide height reading would be taken at regular intervals. The cross sectional area will be determined for the Acushnet River between the bridge embankments.

Turbidity measurements would be made as well and correlated with the PCB suspended particulate phase. If good correlation is found between turbidity and PCB content, turbidity could be monitored in the future to provide some indication for PCB's in the water column.

*"In Estimating the Hazards of Chemical Substance to Aquatic Life" ASTM STP 657, 1978 - PP 55-70 - Branson, D. R.

ENCLOSURE (44c)

RESOURCES REQUIRED

LABORATORY STUDIES

	ACTIVITY	ANALYTICAL PARAMETER	PROPOSED NUMBER OF SAMPLES
I.	Worst Case Leaching	PCB's [Suspended Particulate] [Total]	3 Sediments
		Suspended Materials [Percent Volatile Solids] [Total]	3 Samples/Sediment
			TOTAL 30 ANALYSES/PARAMETER
II.	Quiescent Condition	PCB's [Total]	3 Sediments
			2 Samples/Sediment
			TOTAL 6 ANALYSES

FIELD STUDIES

	ACTIVITY	ANALYTICAL PARAMETER	PROPOSED NUMBER OF SAMPLES
		(Water Column)	
I.	Tidal Cycle	PCB's [Suspended Particulate] [Total] [Bedload]	1 complete set every hour for the tidal cycle-13 hrs.
		Turbidity	
		Suspended Matter [Percent Volative Solids] [Tidal] [Bedload]	
		Salinity	
		Flow measurements	
			TOTAL 40 ANALYSES/PARAMETER

ENCLOSURE (44d)

ACTIVITY	ANALYTICAL PARAMETER	PROPOSED NUMBER OF SAMPLES
II. Snapshot Survey	PCB's [Suspended Particulate] [Total]	Four Locations
	Turbidity	
	Salinity	
	Suspended Matter [Percent Volatile Solids]	

TOTAL 8 ANALYSES

TIME PERIOD

It is expected that the studies will require the entire three month time period.

Phase I (Planning)

During this phase, planning activities consisting of formulating and finalizing the study approach will take place. Principal investigators and resource managers will be solicited for their input regarding committment of resources e.g., equipment, analyst and technician time. Tasks will be scheduled to accomodate logistics and other critical considerations.

Phase II (Implementation)

During this phase, the actual studies will take place. Actual start up is contingent upon the logistics of conducting the study having been accomplished.

Phase III (Analytical)

During this phase, the samples collected during the tidal cycle and laboratory bench studies will be analyzed and later tabulated. The culminating activity of this phase is to submit the data for interpretation.

Phase IV (Data interpretation and report preparation)

All the prinicipal participants will likely be involved in this phase. Data will be assembled and packets will be prepared (as a synoptic report) for distribution to the RRT.

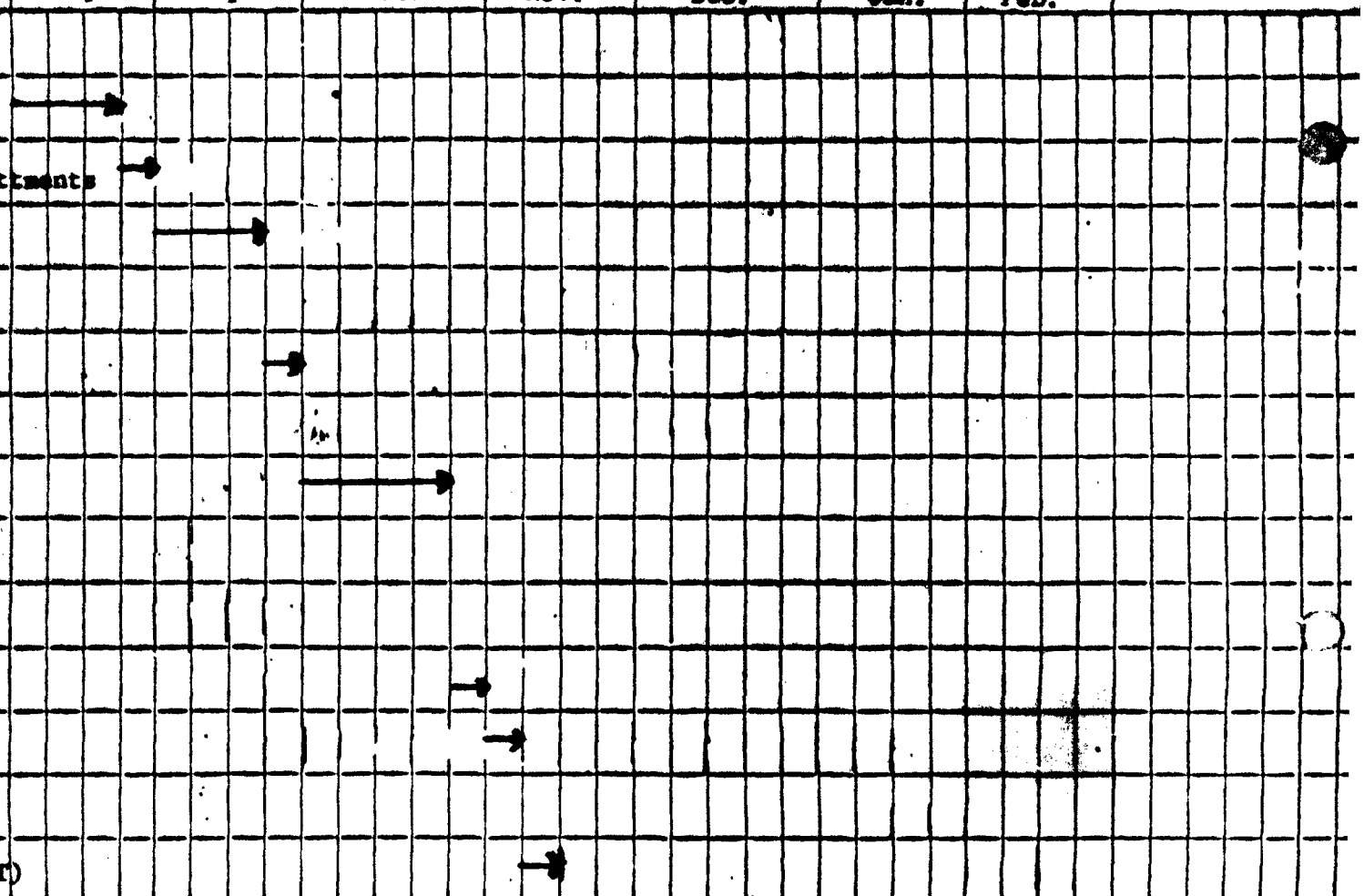
Phase V Presentation to RRT

All activities will pinnacle at the RRT meeting when the study results will be presented and discussed.

ENCLOSURE (44e)

ENCLOSURE (4)

Environmental Response Team



REMARKS:

MADE BY: Royal J. Nadeau

DATE: 8-20-82

LAST REV. DATE:

PROJECT SCHEDULE

FOR:

Release & Movement of PCB's
from Upper New Bedford Harbor

Ref #125

	INFO	ACT		I... O	ACT
XO			MIB		
ACI			MIB		
P/O		✓	OCC		
SIP			SEC		
APX			YN		
MIH			SK		

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
COMMANDING OFFICER
USCG R&D CENTER
AVERY POINT
GROTON, CT. 06340

724154.3
11 JUN 1982

From: Commanding Officer, CG Research and Development Center
To: Commanding Officer, CG Marine Safety Office, Providence, RI

Subj: Acushnet River sediment sample analysis report

Ref: (a) COMDT (G-DMT-4/54) ltr 3913 Ser: 4-1202V of 11 Mar 1982

1. Reference (a) directed the R&D Center to provide chemical analytical support to MSO Providence which was involved in an emergency investigation concerning polychlorinated biphenyl (PCB) contamination in the Acushnet River estuary. Six sediment samples were received at the R&D Center on Friday, 12 March 1982 for determination of PCB concentrations. Chemical analyses were completed on 14 March 1982. Chemical analytical methods used and PCB concentration levels found were reported to MSO Providence by message on Monday, 15 March 1982. As a follow on to our initial quick turn-around response, continued support for the PCB contamination investigation was provided to MSO Providence.

2. Sediment core samples collected between 14 April and 21 April 1982, from the Acushnet River at 33 sampling locations, 3 cores per each location (A,B,C) were analyzed for their PCB contamination by liquid chromatography (LC), thin-layer chromatography (TLC) and gas chromatography (GC).

3. Prior to analysis, the samples were prepared in the following manner. The top inch, the slice between 5½ and 6½ inches and the bottom 2 inches of the 3 core samples from each of the 33 sampling locations were combined and homogenized. The resulting samples were then air dried for approximately 24 hours. Eight (8) mL of solvent were added to 4 g of dried sediment from each sample and sonified for 3 minutes in a test tube. Methanol was used as the solvent to extract PCB from the sediment for LC and TLC; a mixture of 10% acetone in hexane was used as the solvent to extract PCB from the sediment for GC.

4. The chemical analyses were conducted in the following manner.

a. For GC, the samples were analyzed on a 2 foot 3% OV-101 column by electron capture detection. The separation was conducted isothermally at 165°C for 15 minutes, followed by temperature programming at 10°/min to 215°C with a 1 minute hold to bake out the column. Sulfur-containing impurities which interfered with the GC analysis were readily removed with tetrabutylamomium sulfite reagent prior to analysis.

b. For TLC analysis, 5 µL aliquots of methanol extracts were spotted on thin layer chromatographic plates coated with silica gel. Ten (10) samples, i.e., 3 reference standards at concentration levels from 200 ppm to 1000 ppm and 7 sediment samples, were applied to each plate. The plates were air dried for 15 minutes and then developed for 30 to 35 minutes in a vertical chamber containing hexane. The dried plates were then analyzed using a Farrand Optical, Inc. VIS/UV Chromatographic Plate Analyzer in the absorption mode at a fixed wavelength of 235 nm. All plates

ENCLOSURE (32a)

Subj: Acushnet River sediment sample analysis report

were measured at a scan speed of 1 cm per minute. Quantitative values for environmental samples were determined by comparing the response to that of the calibration standards present on each plate.

c. LC analysis was carried out on a ODS Zorbax (DuPont) column with a Whatman guard column at 1 mL/min flow rate with methanol. 20µL standard injection volumes were used measuring UV absorption at 254 nm. All components eluting between 3.5 and 10 minutes were quantitated by measuring peak areas using an electronic integrator.

5. The standards employed for all three analytical methods was Aroclor 1254. Therefore, the tabulation which is attached as Enclosure (1), lists the PCB concentration as ppm 1254 levels. Only one value per sample is reported even though three different analytical methods were applied. The reported concentrations represent a consensus value of the three methods. The depth of the bottom slice analyzed from each core sample varied and is indicated in the last column of the table. (Sediment material for the bottom slice was not available from all core samples.)

6. In order to evaluate the capability of our mobile laboratory to respond in real time on scene to provide chemical analytical support, a field deployment to the Acushnet River in the New Bedford, MA area commenced on 7 June 1982. This deployment is in accordance with project plan 4154, "Sampling, Chemical Classification and Quantification for Pollution Response". The same analytical techniques are applied for this field test as were used in the laboratory investigation, the only difference being the real world environment of a remotely-located field condition on scene. Results of this study will benefit our research endeavor as well as the operational investigation by MSO Providence. Results will be reported when completed.

R. R. BRESLAU
By direction

Encl: (1) PCB Concentration In PPM

Copy: COMDT (G-DMT-4/54)
COMDT (G-WER-2/12)
Commander, First CG District (m)

ENCLOSURE (32b)

PCB CONCENTRATION IN PPM

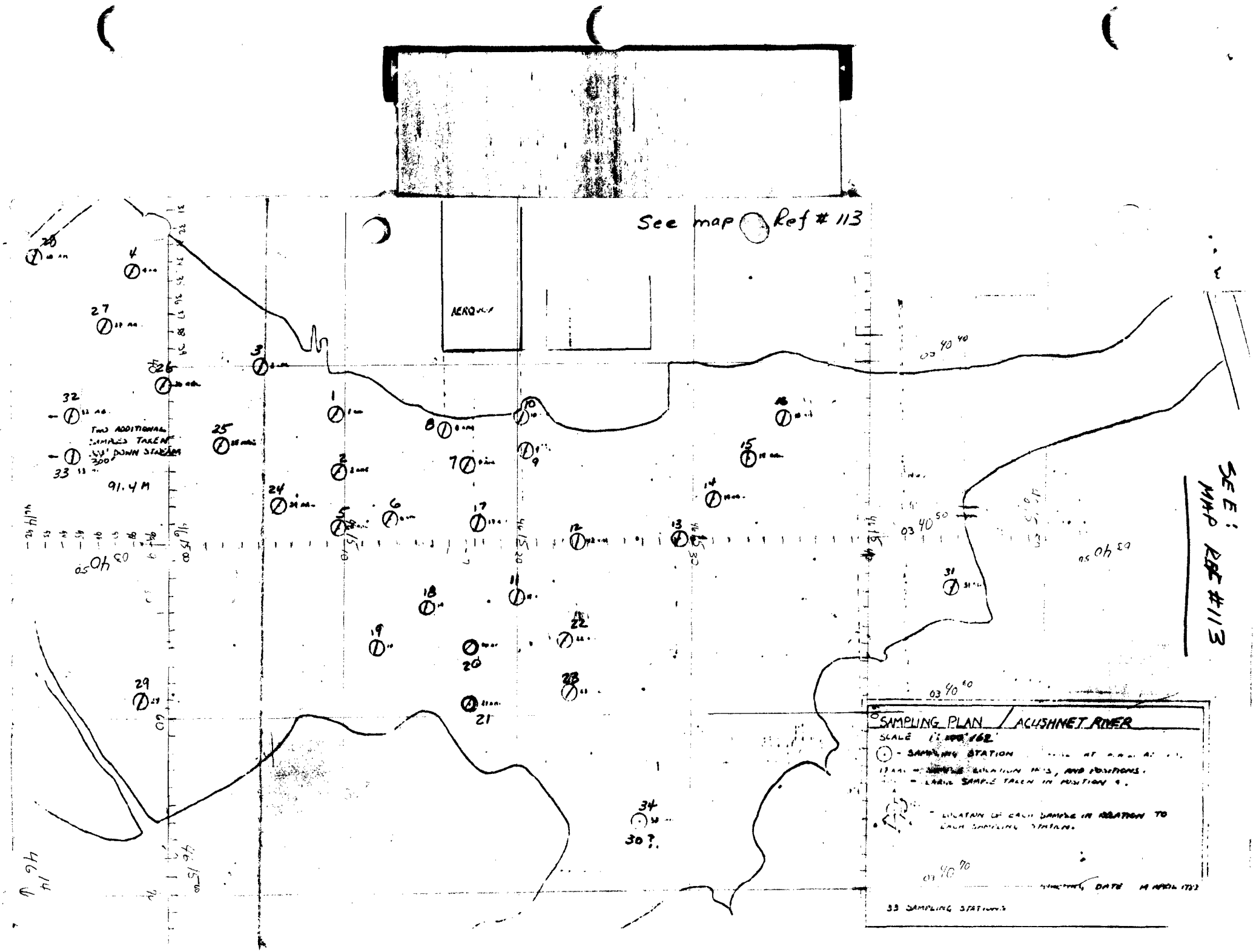
(Calculated against Aroclor 1254 as standard)

MTE No. 11 red

SAMPLE NO.		SUR 0-1"		SHA 5½-6½"		DEP Bottom	Depth of Bottom Slice in Inches
1	1715	1880	2150	1716	830	1717	11-12 (B, C)
2	1718	1920	30700	1719	40	1720	14-15 (A, C)
3	1721	2720	1000	1722	49	1723	16-17 (A,C)
4	1724	1790	670	1725	13	1726	13½-14½ (A,B,C)
5	1727	620	340	1728	26	1729	11-13 (C)
6	1730	850	370	1731	13	1732	12-13 (A,B,C)
7	1733	2520	4150	1734	20	1735	24½-25½ (A)
8	1736	3550	11750	1737	275	1738	13½-14½ (B)
9	1739	16700	38370	1740 Chang	no sample		----------
10	1741	4250	5870	(1741A)	19650	1742	8½-9½ (A,B)
11	1743	1200	320	1744	28	1745	11-13 (A)
12	1746	670	260	1747	78	1748	6½-7½ (C)
13	1749	670	1750	1750	44	1751	11-12 (A,B,C)
14	1752	710	620	1753	6	1754	11-12½ (C)
15	1755	910	600	1756	3	1757	14-15 (B,C)
16	1758	190	20	1759	2	1760	10-12 (A)
17	1761	1910	5180	1762	69	1763	10½-11½ (A,C)
18	1764	1280	1060	1765	20	1766	10-11 (A,B)
19	1767	1250	950	1768	14	1769	12½-13½ (B,C)
20	1770	450	760	1771	420	1772	9-10 (A,C)
21	1773	750	1290	1774	150	1775	8½-9 (A,B,C)
22	1776	600	2770	1777	48	1778	11-12 (B,C)
23	1779	1200	42	1780	79	781	10½-11½ (B,C)
24	1782	1070	480	1783	---		10½-11½ (A,B,C)
25	1784	1690	4740	1785	200	1786	12½-13½ (A,B)
26	1787	1440	7230	1788	810	1789	11-12 (B,C)
27	1790	1980	66500	1791	27	1792	12-13 (A,B,C)
28	1793	1920	47000	1794	25	1795	13½-15½ (C)
29	1796	1130	1430	1797	9	1798	25-26 (B)
30	1799	1920	490	1800	25	1801	12-14 (A,C)
31	1802	2900	1860	1803	2	1804	9-10 (A,B,C)
32	1805	780	5100	1806	3810	1807	8-10 (A,B,C)
33	1808	830	4350	1809	20	(1809A)	11-12 (A,B)

ENCLOSURE (32c)

Enclosure (1)


See map Ref # 113
AERO
TWO ADDITIONAL SAMPLES TAKEN 500' DOWN STREAM
91.4 M
SAMPLING PLAN / ACUSHNET RIVER
SCALE
- SAMPLING STATION
- LOCATION OF EACH SAMPLE IN RELATION TO EACH SAMPLING STATION.
33 SAMPLING STATIONS
SEE MAP Ref #113

L/F126

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
COMMANDING OFFICER
USCG R&D CENTER
AVERY POINT
GROTON, CT 06340

724154.3

From: Commanding Officer, CG Research and Development Center
To: Commanding Officer, CG Marine Safety Office, Providence, RI

Subj: Acushnet River Sediment Sample Analysis Report, Mobile Laboratory Deployment

Ref: (a) CO, R&DC ltr 724154.3 of 11 Jun 1982

1. As stated in reference (a), the R&D Center's Mobile Laboratory was deployed to New Bedford, MA on 7 June 1982 to conduct additional analysis on Acushnet River sediment samples for levels of PCB contamination.

2. A total of ten sites (two samples per site) were sampled on 7 June 1982 along two transects across the Acushnet River approximately midway between Nash Road and Coggleshell Street. The criteria used in selecting these sites was to determine the extent of PCB dispersion and deposition by bottom river bed transport mechanisms. Attempts to collect additional samples at the mouth of the Acushnet River, inside and outside the Hurricane Barrier, were delayed by weather conditions and high winds until 10 June 1982. Hard sandy and rocky bottom conditions prevented sample collection on the western side of the Acushnet River inside and outside the Hurricane Barrier on 10 June 1982. Three samples were taken on the eastern side of the Acushnet River between the channel and the Hurricane Barrier. The exact locations of sampling sites were documented on the map which is in the possession of QM1 J. O'CONNOR from MSO Providence who participated in both sampling trips.

3. The samples collected on 7 June 1982 were prepared and analyzed as described in reference (a) with the following two exceptions:

a. Samples were air dried at a temperature of 25-35^{o}C inside the Mobile Laboratory by passing warm, dry air over the wet sediment samples.

b. A 90% hexane/10% acetone (spectroquality reagents) mixture was used to extract all sediment samples and was used in the determination of PCB levels by the three analytical techniques described in reference (a). Samples collected on 10 June 1982 were returned to the R&D Center and analyzed as described in reference (a) with the exception that a 90% hexane/10% acetone mixture was again used in sample analyses.

4. Analytical determinations of PCB levels commenced on the afternoon of 9 June 1982 and were completed on the afternoon of 11 June 1982. A total of thirty-five (35) samples was analyzed. The results of these analyses were reported to MSO Providence on the morning of 14 June 1982 via telephone. The analytical results of all samples collected on this deployment, i.e., on 7 and 10 June 1982 are tabulated in Table 1 which is attached as Enclosure (1). As stated in reference (a), all PCB levels are reported as ppm Aroclor 1254.

ENCLOSURE (39a)

724154.3
01 JUL 1982

Subj: Acushnet River Sediment Sample Analysis Report, Mobile Laboratory Deployment

5. Since the PCB contamination investigation in the Acushnet River estuary constitutes a response action by MSO Providence under the mandate of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), the following detail is provided to the On-Scene Coordinator (OSC) for informational purposes only. The total expenditure borne by the R&D Center for our assistance in this investigation amounted to $6070.00. Specifically, $3000.00 was paid out for chemicals and materials and $3070.00 for the deployment of the Mobile Laboratory and associated travel (TAD).

Lloyd Breslau

L. R. BRESLAU
By direction

Encl: (1) PCB Concentration in PPM

Copy: COMDT (G-DMT-4/54)
COMDT (G-WER-2/12)
Commander, First CG District (m)

ENCLOSURE (396)

TABLE 1 - PCB CONCENTRATION IN PPM

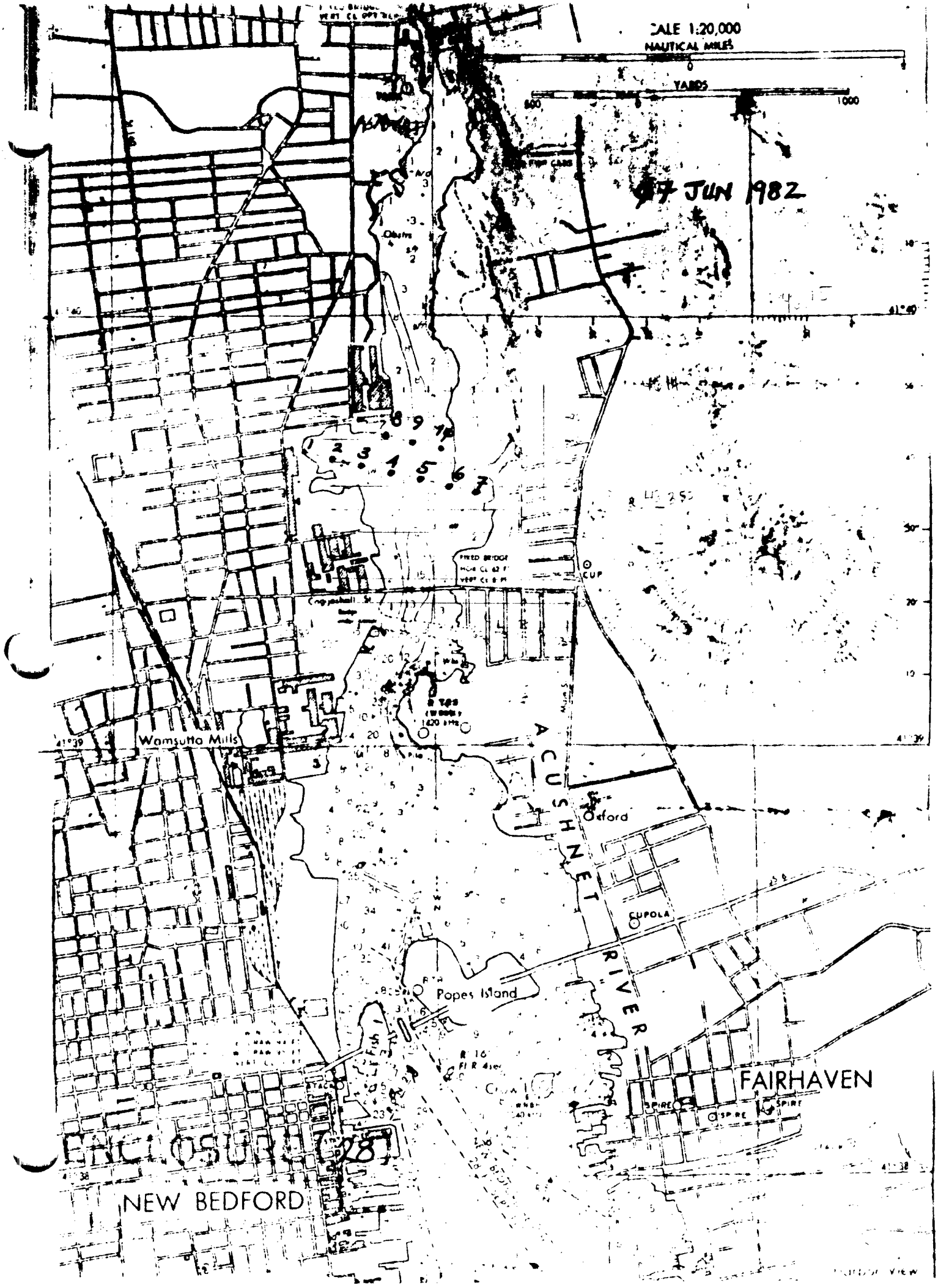
(Calculated against Aroclor 1254 as standard)

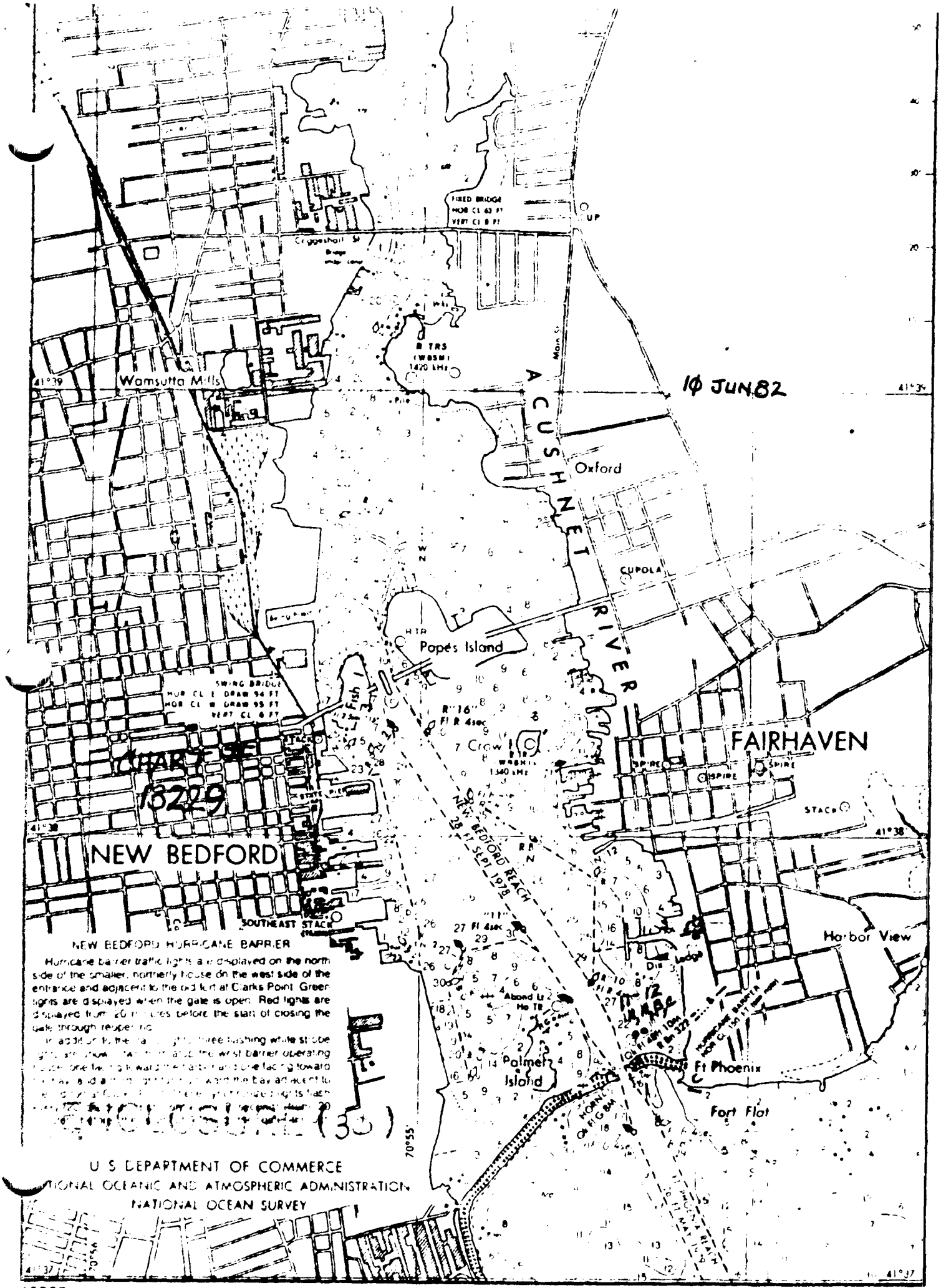
SAMPLE NO.	0-1"	5½-6½"	BOTTOM	DEPTH OF BOTTOM SLICE IN INCHES
1	300	55	25	7-8"
2	400	150	5	10-11"
3	300	160	35	8½-9½"
4	50	NO SAMPLE	45	2-4"
5	70	95	50	15-17"
6	70	10	10	8-9"
7*	40	NO SAMPLE	NO SAMPLE	---
7a*	60	30	10	16-18"
8	190	320	85	7-9"
9	50	330	125	8-9"
10	110	70	30	7-8"
11**	50	70	18	9-11"
12**	SHORT CORE 0-2" 25; 2-4" 10			

* NOTE: Two samples were collected at site seven; one being a core containing 18" of sediment (7a); the second sample contained only sediment left in the core cutter (7).

** NOTE : The two core samples collected on 10 June 1982 are listed as sample number 11. The third sample collected on 10 June 1982, a very short core, is listed as sample number 12.

ENCLOSURE (39c)


SCALE 1:20,000
NAUTICAL MILES
0
YARDS
600
1000
27 JUN 1982
Wamsutta Mills
Oxford
CUSHNET RIVER
CUPOLA
Popes Island
FAIRHAVEN
SPIRE
NEW BEDFORD
ENCLOSURE (28)


Wamsutta Mills
Oxford
ACUSHNET RIVER
Popes Island
NEW BEDFORD
FAIRHAVEN
Harbor View
Palmers Island
Ft Phoenix
Fort Flat
CUPOLA
SPIRE
STACK
SOUTHEAST STACK
NEW BEDFORD REACH
SEP 1979
10 JUN 82
CHART 13229
NEW BEDFORD HURRICANE BARRIER
Hurricane barrier traffic lights are displayed on the north side of the smaller, northerly house on the west side of the entrance and adjacent to the old light at Clarks Point. Green lights are displayed when the gate is open. Red lights are displayed from 20 minutes before the start of closing the gate through reopening.
U S DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

NB6 Appendix A
refs 115-126

DATE	ISSUED TO
GAYLORD 40	