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NEW BEDFORD ENVIRONMENTAL INVESTIGATION-
SAMPLING AND ANALYSIS OF HARBOR BOTTOM
SEDIMENT FOR POLYCHLORINATED
BIPHENYLS (PCBs)

Final Report

Volume 1



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SECTION 1

INTRODUCTION

The Environmental Protection Agency is currently conducting a comprehensive evaluation of the occurrences, distribution, transport, and fate of polychlorinated biphenyls (PCBs) and related organic contaminants within the New Bedford area. An integral part of this program is to supplement the existing data base concerning PCB contamination in bottom sediments in the Acushnet River, New Bedford Harbor, and associated regions of Buzzards Bay. GCA/Technology Division in conjunction with the Environmental Protection Agency and staff of Woods Hole Oceanographic Institute and Bridgewater State College designed a sampling program to supplement the existing data base on PCB concentrations in bottom sediments in the New Bedford, Massachusetts region. Sample sites were selected on the basis of both sedimentological data and existing gaps in the available PCB data base. It was anticipated that this comprehensive sampling and analysis effort in conjunction with other available PCB data would provide measurements suitable for eventual incorporation into a contour map profiling PCB contamination in bottom sediments in the New Bedford region. It was further anticipated that the resultant measurements would further define PCB contamination in the study region. As a consequence a comprehensive sampling effort was conducted in early August of 1982 by means of a collaborative effort between GCA/Technology Division, Dr. J. Sulanowski of Bridgewater State College and staff of the Woods Hole Oceanographic Institute. Sixty-six (66) stations were sampled over a region encompassing the Acushnet River Estuary, inner and outer New Bedford Harbor, Clark's Cove and contiguous regions of Buzzard's Bay. Samples were collected at an average rate of 11 stations per day on 6 sampling days; August 3, 4, 5, 6, 11 and 26, 1982.

The locations of the 66 stations sampled are listed as latitude/longitude coordinates in Section 2. In addition, these locations are shown in the site schematic provided as Attachment A.

Sampling protocols, as outlined in Section 2, consisted of the use of a Van Veen type grab sampler, which generally provided an 8 cm vertical grab sample of the bottom surface. Samples were subdivided to represent upper (0-4 cm) and lower (4-8 cm) surfaces, and transported to the GCA laboratory in Bedford, Mass.

Samples collected from stations numbered 1 through 57 were submitted to Versar, Inc., Springfield, Virginia for PCB analysis. Duplicate aliquots of selected samples from stations 1 through 57 were analyzed at the GCA laboratory in Bedford, Massachusetts. Also analyzed at GCA were samples from

stations 58 through 66. Section 3 outlines the analytical protocols used by Versar Inc. and GCA/Technology, respectively, to obtain PCB measurements on the samples. Analyses proceeded in accordance with accepted reference protocols. PCB measurements were provided in all cases using a gas chromatograph fitted with a Ni⁶³ electron capture detector (GC/ECD).

PCB measurements, from all stations sampled, are presented in Section 5. All data are reported on a dry weight basis, as determined by percent moisture measurements.

Section 4 presents all quality control data specifically generated for this program. This includes results of analysis of all "blind" spikes, duplicates and blank samples submitted to Versar Inc. The results of GCA laboratory control spikes and method blanks are also provided.

SECTION 2

SAMPLING PROTOCOLS

INTRODUCTION

The collection of bottom sediment samples from 66 stations was coordinated by GCA/Technology Division during early August 1982. The stations sampled included the Acushnet River Estuary, Clark's Cove and selected sites from the inner and outer sections of New Bedford Harbor.

SAMPLE CONTAINER PREPARATION

Prior to sampling, 9 oz glass sample containers were rinsed successively in methanol, acetone, toluene and pentane.

SAMPLE COLLECTION

Bottom sediment samples as collected from 66 stations are listed with coordinates in Table 1. A map, siting the stations at their approximate geographic locations is provided as Attachment A. Field personnel designations for each of six sampling dates are noted in Table 2.

A 13-foot Boston Whaler was used for sampling efforts in shallow waters, and the Woods Hole Oceanographic Institute research vessel "Asterias" was used in deeper waters. All bottom sediments were collected using the Van Veen grab sampler pictured in Figure 1. This sampler, fabricated from heavy-gauge steel, is designed for sediment sampling in coastal waters. Closure of the sampling compartment jaws is automatic when the lowering rope slackens upon contact with the bottom surface. The jaws sample a surface area of 0.042 m² with a 10 cm vertical capacity and a sampler compartment capacity of 4 liters. Each jaw is fitted with a hinged lid which facilitates sample removal.

Sediment samples collected for this program were subdivided by depth, at the collection station, by transferring two separate sample portions from the upper 8 cm (0-4 and 4-8 cm) to precleaned sample containers. At some stations, where excess shells, stones or vegetation interfered with completely filling the sampler compartment with sediment, only a 0-4 cm sample was collected. Between stations, the sampler was rinsed with seawater. Samples were transferred using broad stainless steel spatulas which had also been rinsed with seawater. Table 1 lists the samples collected at each station.

TABLE 1. BOTTOM SEDIMENT SAMPLES COLLECTED

Sampling date	Station No. ^a	Latitude ^b	Longitude ^b	Depth ^c (cm)	GCA No. ^d
08/03/82	1	41°39.97'	70°55.13'	0-4	24155
				4-8	24156
	2	41°39.97'	70°55.03'	0-4	24157
				4-8	24158
	3	41°39.97'	70°55.00'	0-4	24160
				4-8	24161
	4	41°39.55'	70°55.17'	0-4	24162
				4-8	24163
	5	41°39.40'	70°55.03'	0-4	24164
4-8				24165	
6	41°39.37'	70°54.97'	0-4	24167	
			4-8	24168	
7	41°39.28'	70°54.93'	0-4	24169	
			4-8	24170	
8	41°39.32'	70°55.13'	0-4	24172	
			4-8	24173	
9	41°39.17'	70°55.17'	0-4	24174	
			4-8	24175	
08/04/82	10	41°38.97'	70°55.10'	0-4	24176
				4-8	24177
	11	41°38.92'	70°54.97'	0-4	24179
				4-8	24180
	12	41°38.83'	70°54.88'	0-4	24181
4-8				24182	
13	41°38.75'	70°54.75'	0-4	24184	
			4-8	24185	
14	41°38.57'	70°54.70'	0-4	24186	
			4-8	24187	

(continued)

TABLE 1 (continued)

Sampling date	Station No. ^a	Latitude ^b	Longitude ^b	Depth ^c (cm)	GCA No. ^d
08/04/82 (cont)	15	41°38.30'	70°54.65'	0-4	24188
				4-8	24189
	16	41°38.40'	70°55.12'	0-4	24191
				4-8	24192
	17	41°38.28'	70°55.28'	0-4	24193
				4-8	24194
	18	41°38.23'	70°55.13'	0-4	24196
				4-8	24197
	19	41°38.17'	70°55.17'	0-4	24198
				4-8	24199
	20	41°38.07'	70°55.05'	0-4	24200
				4-8	24201
21	41°38.12'	70°54.88'	0-4	24203	
			4-8	24204	
22	41°38.42'	70°54.67'	0-4	24205	
			4-8	24206	
08/05/82	23	41°37.23'	70°53.62'	0-4	24208
				4-8	24209
	24	41°37.43'	70°54.33'	0-4	24210
				4-8	e
	25	41°37.50'	70°54.47'	0-4	24211
				4-8	24212
	26	41°37.65'	70°54.43'	0-4	24213
				4-8	24214
27	41°37.37'	70°54.70'	0-4	24216	
			4-8	24217	
28	41°37.88'	70°54.72'	0-4	24218	
			4-8	24219	

(continued)

TABLE 1 (continued)

Sampling date	Station No. ^a	Latitude ^b	Longitude ^b	Depth ^c (cm)	GCA No. ^d
08/05/82 (cont)	29	41°38.90'	70°55.02'	0-4	24221
				4-8	24222
	30	41°38.00'	70°54.78'	0-4	24223
4-8				24224	
08/06/82	31	41°38.07'	70°54.68'	0-4	24225
				4-8	24226
	32	41°35.77'	70°53.78'	0-4	24228
4-8				24229	
33	41°35.53'	70°54.90'	0-4	24230	
			4-8	e	
34	41°36.37'	70°55.20'	0-4	24231	
			4-8	24232	
35	41°36.70'	70°55.42'	0-4	24234	
			4-8	24235	
36	41°36.73'	70°55.75'	0-4	24236	
			4-8	24237	
37	41°35.42'	70°55.60'	0-4	24238	
			4-8	e	
38	41°35.20'	70°55.75'	0-4	24240	
			4-8	24241	
08/11/82	39	41°33.91'	70°46.45'	0-4	24242
				4-8	24243
	40	41°34.87'	70°47.40'	0-4	24245
				4-8	24246
41	41°35.35'	70°46.67'	0-4	24247	
			4-8	24248	
42	41°36.18'	70°47.13'	0-4	24249	
			4-8	24250	

(continued)

TABLE 1 (continued)

Sampling date	Station No. ^a	Latitude ^b	Longitude ^b	Depth ^c (cm)	GCA No. ^d
08/11/82 (cont)	43	41°37.04'	70°47.60'	0-4	24252
				4-8	24253
	44	41°36.63'	70°48.53'	0-4	24254
				4-8	24255
	45	41°35.70'	70°47.96'	0-4	24257
				4-8	24258
	46	41°34.02'	70°48.60'	0-4	24259
				4-8	24260
	47	41°33.23'	70°47.84'	0-4	24261
				4-8	24262
	48	41°33.49'	70°49.69'	0-4	24264
				4-8	24265
	49	41°33.27'	70°51.16'	0-4	24266
				4-8	24267
	50	41°33.80'	70°52.13'	0-4	24269
				4-8	24270
	51	41°34.70'	70°52.88'	0-4	24271
				4-8	24272
	52	41°34.67'	70°55.95'	0-4	24273
				4-8	24274
	53	41°34.16'	70°55.49'	0-4	24276
				4-8	24277
	54	41°33.04'	70°54.77'	0-4	24278
				4-8	24279
	55	41°32.89'	70°54.35'	0-4	24280
				4-8	24281
	56	41°35.90'	70°53.62'	0-4	24282
				4-8	24283

(continued)

TABLE 1 (continued)

Sampling date	Station No. ^a	Latitude ^b	Longitude ^b	Depth ^c (cm)	GCA No. ^d
08/11/82 (cont)	57	41°36.65'	70°53.94'	0-4	24284
				4-8	24285
08/26/82	58	41°35.96'	70°52.60'	0-4	27217
				4-8	e
	59	41°35.92'	70°52.31'	0-4	27218
				4-8	e
	60	41°36.40'	70°52.61'	0-4	27219
				4-8	27220
	61	41°36.52'	70°52.27'	0-4	27221
				4-8	e
	62	41°37.48'	70°52.97'	0-4	27222
				4-8	e
63	41°37.47'	70°52.49'	0-4	27223	
			4-8	e	
64	41°34.50'	70°49.18'	0-4	27224	
			4-8	e	
65	41°34.29'	70°49.61'	0-4	27225	
			4-8	e	
66	41°34.02'	70°50.19'	0-4	27226	
			4-8	e	

^aCorresponds to Station No. provided on GCA contour map.

^bBearings for Stations 1 through 38 taken with hand compass on permanent local features noted on topographic maps and navigational charts. Bearings for Stations 39 through 66 taken using Loran fixes.

^cDenotes subsamples provided by Van Veen grab sampler at each station.

^dSample identification assigned from GCA Master Log Book upon receipt at GCA Sample Bank.

^eNo subsample collected from this depth; Van Veen sampler resurfaced partially filled due to bottom conditions not optimum for sampling.

TABLE 1 (continued)

Sampling date	Station No. ^a	Latitude ^b	Longitude ^b	Depth ^c (cm)	GCA No. ^d			
08/11/82 (cont)	57	41°36.65'	70°53.94'	0-4	24284			
				4-8	24285			
08/26/82	58	41°35.96'	70°52.60'	0-4	27217			
				4-8	e			
				59	41°35.92'	70°52.31'	0-4	27218
							4-8	e
				60	41°36.40'	70°52.61'	0-4	27219
							4-8	27220
				61	41°36.52'	70°52.27'	0-4	27221
							4-8	e
				62	41°37.48'	70°52.97'	0-4	27222
							4-8	e
63	41°37.47'	70°52.49'	0-4	27223				
			4-8	e				
64	41°34.50'	70°49.18'	0-4	27224				
			4-8	e				
65	41°34.29'	70°49.61'	0-4	27225				
			4-8	e				
66	41°34.02'	70°50.19'	0-4	27226				
			4-8	e				

^aCorresponds to Station No. provided on GCA contour map.

^bBearings for Stations 1 through 38 taken with hand compass on permanent local features noted on topographic maps and navigational charts. Bearings for Stations 39 through 66 taken using Loran fixes.

^cDenotes subsamples provided by Van Veen grab sampler at each station.

^dSample identification assigned from GCA Master Log Book upon receipt at GCA Sample Bank.

^eNo subsample collected from this depth; Van Veen sampler resurfaced partially filled due to bottom conditions not optimum for sampling.

TABLE 2. SAMPLE COLLECTION DATES/FIELD
PERSONNEL

Sampling date(s)	Sampling personnel	Affiliation
8/03-08/06/82	P. Ford	GCA
	J. Sulanowski	Private subcontractor to GCA
	D. DeLorenzo	Private subcontractor to GCA
8/11/82	P. Ford	GCA
	B. Tripp	Woods Hole Oceanographic Institute
	H. Clifford	Woods Hole Oceanographic Institute
8/26/82	B. Tripp	Woods Hole Oceanographic Institute
	H. Clifford	Woods Hole Oceanographic Institute

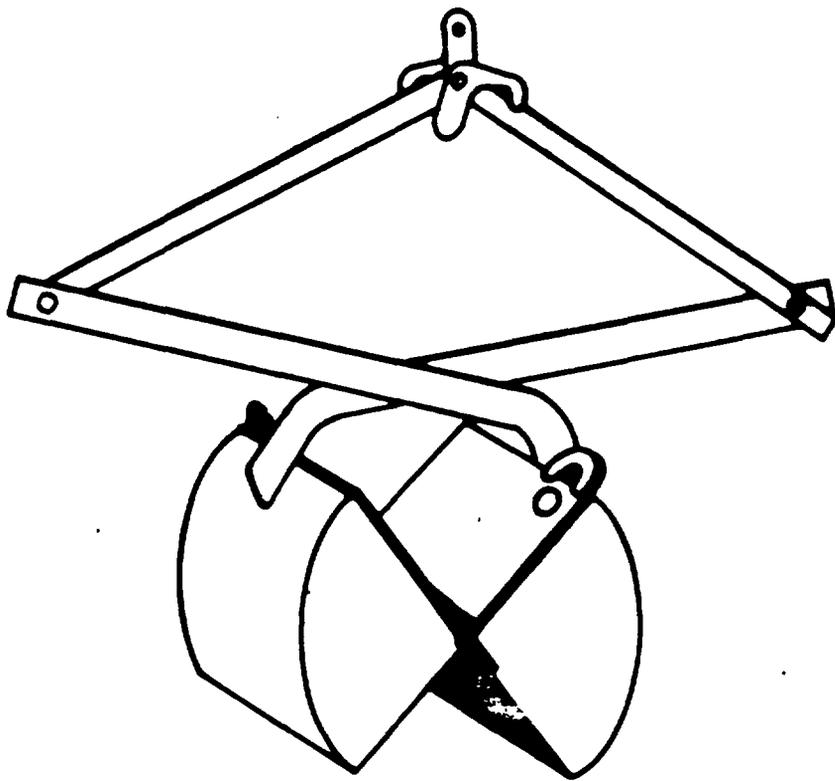


Figure 1. Van Veen Grab Sampler.

CHAIN OF CUSTODY

After samples had been collected and labeled for identification, they were entered in the project field log and on chain-of-custody records. Samples locked in coolers were maintained at less than 4°C at the Woods Hole Oceanographic Institute prior to transfer to the GCA Laboratory.

SECTION 3

ANALYTICAL PROTOCOLS

INTRODUCTION

Sediment samples collected from 66 stations were analyzed by Versar Inc. and/or GCA/Technology Division for PCB content. Procedures used to document chain of custody and to perform PCB analyses are presented below.

SAMPLE BANK RECEIPT AND CHAIN OF CUSTODY

A total of 121 sediment samples were received at the GCA/Technology Division Sample Bank during August and October 1982. The samples, accompanied by chain of custody documentation, were submitted as follows:

<u>Date of receipt</u>	<u>Number of samples</u>
August 9	73
August 13	38
October 4	10

Routine inspection upon receipt of each set revealed all samples to be in good condition, securely tagged, and appropriately chilled. Careful comparison of the sample tags with the chain of custody records verified sample identification. These records were signed by Sample Bank personnel and placed in the permanent project file. The samples were then entered in the Master Log Book where each individual sample was assigned a GCA Control Number. This unique identification was affixed to the respective sample containers and subsequently used throughout the laboratory analysis procedures for positive traceability. Table 1 in Section 2 contains the complete list of samples received and their corresponding assigned GCA Control Numbers.

Chain of custody procedures were maintained in the laboratory through the use of GCA Custody Notebooks. At the time of receipt, a page for each sample was entered sequentially by GCA Control Number in the Custody Notebook, and the samples were transferred to the locked Sample Bank for storage at 4°C until the time of analysis. Subsequent handling of the samples was documented by the recording of signatures and dates in the Custody Notebook. In addition, the transfer of samples or extracts between analysts within the laboratory was documented on Sample Custody Transfer forms which become part of the permanent project file and serve as a supplement to the Custody Notebook record of sample handling.

The transfer of samples from GCA/Technology Division to Versar Inc., Springfield, Virginia, was documented on the appropriate custody notebook pages and on custody forms prepared at GCA. These forms accompanied the samples during shipment, were signed by receiving personnel, and were returned to the GCA Sample Bank for entry in the project file.

SAMPLE PREPARATION AND ANALYSIS

Versar, Inc.

Sample Preparation^{1,2}--

Sediment samples were homogenized and aliquotted into two representative 10.0 gram portions. One aliquot was added to 50 ml of acetone: hexane (1:1) in a stoppered 250 ml erlenmeyer flask. The flask was then placed on a mechanical shaker. After 30 minutes, the extract was decanted through sodium sulfate and an aliquot cleaned up via florisil chromatography. The other aliquot was air-dried to determine the dry weight of the extracted portion.

Sample Quantitation--

Sediment extracts were analyzed for PCB using the instrumental operating conditions described in Reference 3. Aroclor identification was based on a comparison of sample response pattern with those of Aroclor standards. Quantitation was performed by comparing the summed integrated areas of samples with a 3-point standard calibration curve. Samples which resembled but did not strictly match an Aroclor pattern were analyzed using the method of Webb and McCall.⁴

GCA/Technology

Sample Preparation--

From each of the sediment samples, a representative aliquot was removed for determination of moisture content according to procedures outlined in Reference 5. Weighed portions of air-dried sediment were subsequently dried for 16 hours at 103°C and reweighed to obtain the oven-dry weight which is then applied to correct the extracted weight of the sample. The sediment samples were prepared for PCB analysis according to the procedures specified in Reference 5. Aliquots of wet sediment were removed from the samples, air dried in a fume hood, and subsequently weighed into glass thimbles for soxhlet extraction. Calculated dry weights of these extracted sediment aliquots were approximately 5 grams. A 16-hour extraction was performed using 1:1 hexane:acetone solvent. The solvent extract was then concentrated to 10.0 ml via rotary evaporation (40°C). To reduce matrix interferences, the sample extracts were subjected to florisil column chromatography,³ followed by a sulfuric acid partitioning.⁶

Sample Quantitation--

Sample extracts were analyzed for PCB using a Hewlett-Packard 5840A with a Ni⁶³ electron capture detector and HP 7671A automatic sampler. The instrumental operating parameters are listed in Reference 3. Aroclor identification was accomplished by pattern matching techniques. Instrument calibration was accomplished using dilutions of Aroclor standard reference material from the reference repository at EPA/RTP. Four-point calibration

curves were constructed by performing a linear regression analysis on the 5-peak summation of detector response versus the concentrations of the standard mixture. The correlation coefficient on all calibration curves was greater than 0.999. The summed detector response to samples was entered into the appropriate calibration curve in order to determine Aroclor content.

SECTION 4

QUALITY CONTROL

The quality control protocol for this project included the analysis of "blind" QC samples, both spikes and duplicates, laboratory control samples and laboratory method blanks. Reported values for the method blank analyses were all less than 0.10/ μ g. Results of analyses of replicates, spikes, and laboratory control samples are presented in this section.

REPLICATE ANALYSES

Fifteen "blind" duplicate aliquots of samples submitted to Versar, Inc. were relabeled at GCA with new GCA Control Numbers and included with the sample shipment. Thus, their identity as replicates was not known to Versar personnel. Eight of the duplicates were selected from areas suspected of containing PCB residues and seven from areas suspected of having low or undetectable PCB residues. Additionally, 14 duplicate aliquots of samples analyzed by Versar, Inc. were also analyzed by GCA/Technology. These samples were selected after PCB results were submitted to EPA by Versar.

In accordance with the previous approach for replicate analysis, approximately 50 percent of the replicate samples analyzed by GCA were those reported as containing measureable PCB residues. The remaining 50 percent were selected from samples reported as "contaminant free" with respect to PCB residues. The results from Versar and GCA analysis of replicate samples are presented in Table 3.

"BLIND" SAMPLES

Four "blind" samples were submitted to Versar, Inc. along with the program samples. Three of these were EPA/EMSL reference materials (WP 978, PCBs in Sediment), which were aliquotted and dampened with organic free laboratory water to simulate the appearance of program samples. The fourth was a sediment sample which had previously been analyzed by GCA and found to contain <0.5 mg/kg of PCB. The reference materials and uncontaminated sediment were coded in the same manner as actual samples and assigned GCA numbers. The results reported by Versar, Inc. for the above samples are shown in Table 4. A review of reported QC data was performed by personnel at the EPA Region I--NERL in Lexington, MA. The data were found to be within the 95 percent confidence level and approved for release.

TABLE 3. RESULTS OF ANALYSIS OF DUPLICATE SEDIMENT ALIQUOTS

Station	First aliquot (analyzed by Versar Inc.)		Duplicate aliquot ^a			
	Aroclor found	Concen- tration ^b (mg/kg)	GCA No.	Aroclor found	Concen- tration ^b (mg/kg)	Analyzing laboratory
155	1248	18	24171	1248	11	Versar
157	1248	280	24157	1242/1016 ^c 1254	290 160	GCA GCA
158	1248	360	24207	1248 & 1254	360	Versar
160	1248	860	24183	1242	1200	Versar
161	1248	840	24161	1242/1016 ^c 1254	280 280	GCA GCA
162	1248	270	24162	1242/1016 ^c 1254	700 130	GCA GCA
163	1248	250	24220	1248	240	Versar
164	1248	100	24251	1248 & 1254	150	Versar
167	1248	240	24167	1242/1016 ^c 1254	230 100	GCA GCA
168	1248 & 1260	590	24239	1248	520	Versar
169	1248 & 1260	99	24268	1248 & 1254	120	Versar
173	1248	33	24166	1248	25	Versar
180	1248 & 1254	6	24180	1242/1016 ^c 1254	1.6 1.6	GCA GCA
185	1248 & 1254	170	24185	1242/1016 ^c 1254	77 120	GCA GCA
198	1248 & 1254	23	24198	1242/1016 ^c 1254	21 13	GCA GCA

(continued)

TABLE 3 (continued)

GCA No.	First aliquot (analyzed by Versar Inc.)		Duplicate aliquot ^a			Analyzing laboratory
	Aroclor found	Concentration ^b (mg/kg)	GCA No.	Aroclor found	Concentration ^b (mg/kg)	
208		<1	24208		<1	GCA
214		<1	24214		<1	GCA
229	1248 & 1254	<1	24229	1242/1016 ^c 1254	8.3 9.0	GCA GCA
249		<1	24159		<1	Versar
253		<1	24275		<1	Versar
255		<1	24255		<1	GCA
261		<1	24227		<1	Versar
267		<1	24195		<1	Versar
270		<1	24256		<1	Versar
272	1254	4	24272	1242/1016 ^c 1254	1.1 1.3	GCA GCA
277		<1	24202		<1	Versar
278		<1	24233		<1	Versar
280		<1	24280		<1	GCA
285	1248 & 1254	20	24285	1242/1016 ^c 1254	7.7 6.5	GCA GCA

^aDuplicate sample aliquots sent to Versar were assigned a new GCA No.

^bAll values reported on a dry weight basis.

^cAroclors 1242 and/or 1016 identified; quantitation based on Aroclor 1242. See Section 5.

TABLE 4. VERSAR ANALYSIS OF "BLIND" SAMPLES

GCA No.	Sample identification	Reported		Expected		95% Confidence interval
		Aroclor	Concentration (mg/kg)	Aroclor	Concentration (mg/kg)	
24215 (SAS No. 61)	Blank ^a	1248	2	-	-	-
24190 (SAS No. 36)	EPA Group 1 ^b	1242	27	1242	24.6	MDL ^c -51.6
24244 (SAS No. 90)	EPA Group 2 ^b	1254	4	1254	2.34	MDL ^c -5.37
24178 (SAS No. 24)	EPA Group 3 ^b	1248	6 ^d	1242 1254	7.83 6.48	2.47-13.2 3.74-9.22
				TOTAL PCB	14.3	6.2 - 22.4

18

^aThe blank consisted of a sediment sample which had been previously analyzed by GCA and found to contain <0.5 mg/kg PCB.

^bEPA PCBs in Sediment Quality Control Samples--WP978, Environmental Monitoring and Support Laboratory, Cincinnati, OH.

^cMDL - Minimum Detection Limit for a given method and/or instrument

^dThis value falls within the 95% confidence interval since only one significant figure was reported at this level.

LABORATORY CONTROL SAMPLES--GCA

In order to provide some measure of the analytical precision and accuracy of the GCA analytical measurements, a sample of EPA/EMSL Reference Material for PCBs in Sediment (WP 978, Group 1) was included with each group of samples processed. The resulting cumulative data are presented in Table 5. In addition, a single sample of EPA/EMSL WP 978, Group 3 was inserted as an additional laboratory control sample; the results of this analysis are shown in Table 6. It should be noted that the Aroclor identity and corresponding concentrations were unknown to the analyst at the time of analysis.

TABLE 5. GCA CUMULATIVE DATA FOR THE ANALYSIS OF AROCLOR 1242 IN SEDIMENT

Sample identification	Expected Concentration (mg/kg)	Reported (mg/kg) Concentration					\bar{X}	S_x	Relative standard deviation (%)	Average recovery (%)
		QC 042	QC 043	QC 079	QC 080	QC 088				
EPA Group 1 ^a	24.6	27	22	21	22	20	22	2.7	12	89

^aEPA PCBs in Sediment quality control sample--WP978, Environmental Monitoring and Support Laboratory, Cincinnati, OH.

TABLE 5. GCA CUMULATIVE DATA FOR THE ANALYSIS OF AROCLOR 1242 IN SEDIMENT

Sample identification	Expected Concentration (mg/kg)	Reported (mg/kg) Concentration					\bar{X}	S_x	Relative standard deviation (%)	Average recovery (%)
		QC 042	QC 043	QC 079	QC 080	QC 088				
EPA Group 1 ^a	24.6	27	22	21	22	20	22	2.7	12	89

20

^aEPA PCBs in Sediment quality control sample--WP978, Environmental Monitoring and Support Laboratory, Cincinnati, OH.

TABLE 6. GCA ANALYSIS OF LABORATORY CONTROL SAMPLE

Sample identification	Reported		Expected		
	Aroclor	Concentration (mg/kg)	Aroclor	Concentration (mg/kg)	Recovery (%)
QC 127 (EPA Group 3) ^a	1242	8.7	1242	7.83	110
	1254	8.5	1254	6.48	130

^aEPA PCBs in Sediment quality control sample--WP978, Environmental Monitoring and Support Laboratory, Cincinnati, OH.

SECTION 5
RESULTS OF ANALYSIS

Results of the PCB analysis conducted on the 121 submitted sediment samples are presented on Table 7. The geographical location of each sampling station is identified by coordinates of latitude and longitude. The approximate station location can be found on the site schematic provided as Attachment A.

As previously mentioned, samples from Stations 1 through 57 were analyzed by Versar, Inc. Samples from the remaining stations were analyzed by GCA/Technology. All reported values are based on the dry weight of sediment analyzed.

As noted in Table 7, analyses performed at GCA/Technology identified Aroclors 1242 and/or 1016 and Aroclor 1254 as present in several program samples. These samples exhibited an electron-capturing interference in the region of the chromatographic pattern which is essential for discrimination between Aroclors 1242 and 1016. As a result, absolute differentiation between the two Aroclors is not possible. Quantitation of PCB content in this chromatographic region is based on the response of Aroclor 1242. The quantitation of Aroclor 1254 was not affected by these interferences.

TABLE 7. PCB ANALYSIS RESULTS FOR SEDIMENT SAMPLES^a

Station No. ^b	Latitude	Longitude	Depth (cm)	GCA No.	Aroclor found	Concentration ^c (mg/kg)
1	41°39.97'	70°55.13'	0-4	24155	1248	18
			4-8	24156	1248	16
2	41°39.97'	70°55.03'	0-4	24157	1248	280
			4-8	24158	1248	360
3	41°39.97'	70°55.00'	0-4	24160	1248	860
			4-8	24161	1248	840
4	41°39.55'	70°55.17'	0-4	24162	1248	270
			4-8	24163	1248	250
5	41°39.40'	70°55.03'	0-4	24164	1248	100
			4-8	24165	1248	66
6	41°39.37'	70°54.97'	0-4	24167	1248	240
			4-8	24168	1248 & 1260	590
7	41°39.28'	70°54.93'	0-4	24169	1248 & 1260	99
			4-8	24170	1248	56
8	41°39.32'	70°55.13'	0-4	24172	1248	36
			4-8	24173	1248	33
9	41°39.17'	70°55.17'	0-4	24174	1248	20
			4-8	24175	1248	18
10	41°38.97'	70°55.10'	0-4	24176	1248	60
			4-8	24177	1248	53
11	41°38.92'	70°54.97'	0-4	24179	1248	1
			4-8	24180	1248 & 1254	6
12	41°38.83'	70°54.88'	0-4	24181	1248 & 1254	64
			4-8	24182	1248 & 1254	77
13	41°38.75'	70°54.75'	0-4	24184	1248 & 1254	130
			4-8	24185	1248 & 1254	170
14	41°38.57'	70°54.70'	0-4	24186	1248 & 1254	8
			4-8	24187	1248 & 1254	8

(continued)

TABLE 7 (continued)

Station No. ^b	Latitude	Longitude	Depth (cm)	GCA No.	Aroclor found	Concentration ^c (mg/kg)
15	41°38.30'	70°54.65'	0-4	24188	1248 & 1254	24
			4-8	24189	1248 & 1254	43
16	41°38.40'	70°55.12'	0-4	24191	1248 & 1254	35
			4-8	24192	1248	25
17	41°38.28'	70°55.28'	0-4	24193	1248 & 1254	45
			4-8	24194	1248 & 1254	53
18	41°38.23'	70°55.13'	0-4	24196	1248 & 1254	15
			4-8	24197	1248 & 1254	15
19	41°38.17'	70°55.17'	0-4	24198	1248 & 1254	23
			4-8	24199	1248 & 1254	33
20	41°38.07'	70°55.05'	0-4	24200	1248 & 1254	40
			4-8	24201	1248 & 1254	40
21	41°38.12'	70°54.88'	0-4	24203	1248	28
			4-8	24204	1248 & 1254	45
22	41°38.42'	70°54.67'	0-4	24205	1248 & 1254	56
			4-8	24206	1248 & 1254	60
23	41°37.23'	70°53.62'	0-4	24208		<1
			4-8	24209		<1
24	41°37.43'	70°54.33'	0-4	24210		<1
			4-8	d		<1
25	41°37.50'	70°54.47'	0-4	24211	1248 & 1254	20
			4-8	24212	1248 & 1254	26
26	41°37.65'	70°54.43'	0-4	24213		<1
			4-8	24214		<1
27	41°37.37'	70°54.70'	0-4	24216	1248 & 1254	34
			4-8	24217	1248 & 1254	35
28	41°37.88'	70°54.72'	0-4	24218	1248 & 1254	26
			4-8	24219	1248 & 1254	32

(continued)

TABLE 7 (continued)

Station No. ^b	Latitude	Longitude	Depth (cm)	GCA No.	Aroclor found	Concentration ^c (mg/kg)
29	41°38.90'	70°55.02'	0-4	24221	1248 & 1254	26
			4-8	24222	1248 & 1254	28
30	41°38.00'	70°54.78'	0-4	24223	1248 & 1254	29
			4-8	24224	1248 & 1254	24
31	41°38.07'	70°54.68'	0-4	24225	1248 & 1254	20
			4-8	24226	1248 & 1254	20
32	41°35.77'	70°53.78'	0-4	24228	1248	98
			4-8	24229	1248 & 1254	10
33	41°35.53'	70°54.90'	0-4	24230		<1
			4-8	d		
34	41°36.37'	70°55.20'	0-4	24231	1248 & 1254	6
			4-8	24232	1254	5
35	41°36.70'	70°55.42'	0-4	24234	1254	5
			4-8	24235	1254	4
36	41°36.73'	70°55.75'	0-4	24236	1254	8
			4-8	24237		<1
37	41°35.42'	70°55.60'	0-4	24238		<1
			4-8	d		
38	41°35.20'	70°55.75'	0-4	24240		<1
			4-8	24241		<1
39	41°33.91'	70°46.45'	0-4	24242		<1
			4-8	24243		<1
40	41°34.87'	70°47.40'	0-4	24245		<1
			4-8	24246		<1
41	41°35.35'	70°46.67'	0-4	24247		<1
			4-8	24248		<1
42	41°36.18'	70°47.13'	0-4	24249		<1
			4-8	24250		<1

(continued)

TABLE 7 (continued)

Station No. ^b	Latitude	Longitude	Depth (cm)	GCA No.	Aroclor found	Concentration ^c (mg/kg)
43	41°37.04'	70°47.60'	0-4	24252		<1
			4-8	24253		<1
44	41°36.63'	70°48.53'	0-4	24254		<1
			4-8	24255		<1
45	41°35.70'	70°47.96'	0-4	24257		<1
			4-8	24258		<1
46	41°34.02'	70°48.60'	0-4	24259		<1
			4-8	24260		<1
47	41°33.23'	70°47.84'	0-4	24261		<1
			4-8	24262		<1
48	41°33.49'	70°49.69'	0-4	24264		<1
			4-8	24265		<1
49	41°33.27'	70°51.16'	0-4	24266		<1
			4-8	24267		<1
50	41°33.80'	70°52.13'	0-4	24269		<1
			4-8	24270		<1
51	41°34.70'	70°52.88'	0-4	24271	1242	5
			4-8	24272	1254	4
52	41°34.67'	70°55.95'	0-4	24273	1254	5
			4-8	24274	1254	5
53	41°34.16'	70°55.49'	0-4	24276		<1
			4-8	24277		<1
54	41°33.04'	70°54.77'	0-4	24278		<1
			4-8	24279		<1
55	41°32.89'	70°54.35'	0-4	24280		<1
			4-8	24281		<1
56	41°35.90'	70°53.62'	0-4	24282	1254	8
			4-8	24283	1254	6

(continued)

TABLE 7 (continued)

Station No. ^b	Latitude	Longitude	Depth (cm)	GCA No.	Aroclor found	Concentration ^c (mg/kg)
57	41°36.65'	70°53.94'	0-4	24284	1254	5
			4-8	24285	1248 & 1254	20
58	41°35.96'	70°52.60'	0-4	27217		<1
			4-8	d		
59	41°35.92'	70°52.31'	0-4	27218		<1
			4-8	d		
60	41°36.40'	70°52.61'	0-4	27219	1254	1.7
			4-8	27220		<1
61	41°36.52'	70°52.27'	0-4	27221		<1
			4-8	d		
62	41°37.48'	70°52.97'	0-4	27222	1242/1016 ^e	2.4
			4-8	d	1254	2.1
63	41°37.47'	70°52.49'	0-4	27223		<1
			4-8	d		
64	41°34.50'	70°49.18'	0-4	27224		<1
			4-8	d		
65	41°34.29'	70°49.61'	0-4	27225		<1
			4-8	d		
66	41°34.02'	70°50.19'	0-4	27226		<1
			4-8	d		

^aSamples from Stations 1 through 57 analyzed by Versar Inc.
Samples from Stations 58 through 66 analyzed by GCA/Technology Division.

^bCorresponds to Station No. provided on GCA contour map.

^cAll values reported on a dry weight basis.

^dNo subsample collected from this depth; Van Veen sampler resurfaced partially filled due to bottom conditions not optimum for sampling.

^eAroclors 1242 and/or 1016 identified; quantitation is based on Aroclor 1242. See text.

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Cambridge Analytical Associates

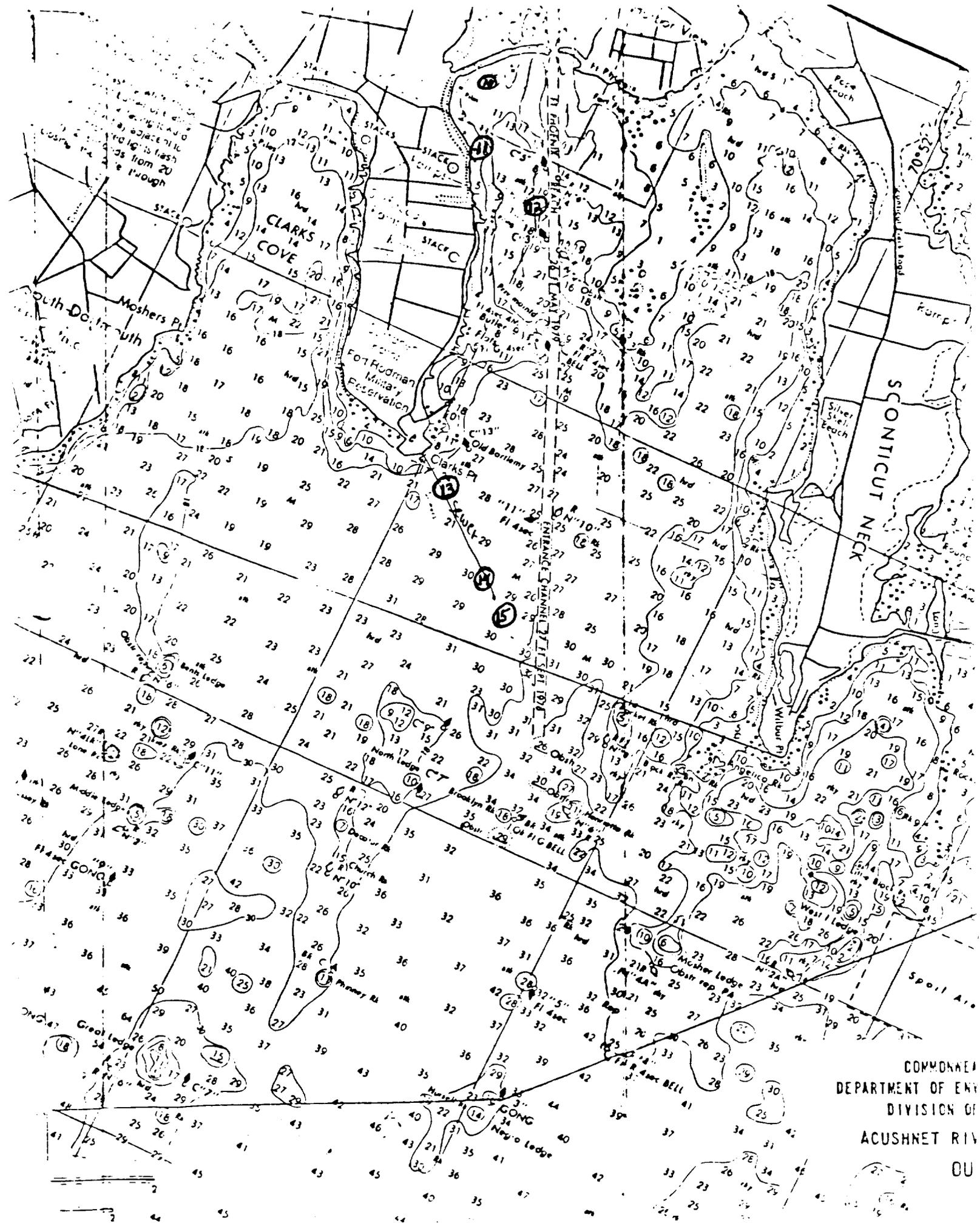
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SUMMARY OF RESULTS

DEQE#	CAA#	Concentration in ppb ¹						
		425 1016	419 1221	420 1232	421 1242	422 1248	1254	1260
7/17/81	1731-F 810720-8	ND ²	ND	ND	ND	4.0	ND	ND
	2 731-F 810720-9	ND	ND	ND	ND	2.7	ND	ND
	3 731-F 810720-10	ND	ND	ND	ND	2.4	ND	ND
	4 733-F 810720-11	ND	ND	ND	1.2	ND	ND	ND
	5 734-F 810720-12	ND	ND	ND	1.2	ND	ND	ND
	6 735-F 810720-13	ND	ND	ND	ND	ND	ND	ND
	7 737-F 810720-14	ND	ND	ND	ND	ND	ND	ND
	8 738-F 810720-15	ND	ND	ND	ND	ND	ND	ND
	9 739-F 810720-16	ND	ND	ND	ND	ND	ND	ND
	10 740-F 810720-17	ND	ND	ND	ND	ND	ND	ND
	11 741-F 810720-18	ND	ND	ND	ND	ND	ND	ND
	12 742-F 810720-19	ND	ND	ND	ND	ND	ND	ND
	13 743-F 810720-20	ND	ND	ND	ND	ND	ND	ND
	14 744-F 810720-21	ND	ND	ND	ND	ND	ND	ND
	15 745-F 810720-22	ND	ND	ND	ND	ND	ND	ND
7/21	Main St. Bridge South #4 745-F 810722-4	ND	ND	ND	ND	ND	ND	ND
	Hanlin Rd. Pond outlet #5 746-F 810722-5	ND	ND	ND	ND	ND	ND	ND
	Coggle shell Bridge North #6 1321-F 810722-6	ND	ND	ND	trace ³	ND	ND	ND

1. Concentration of polychlorinated biphenyls in the sample in parts-per-billion (ng/ml).
2. ND - none detected. Lower limit of detection 0.5 ppb.
3. Trace - less than 2 times the lower limit of detection.



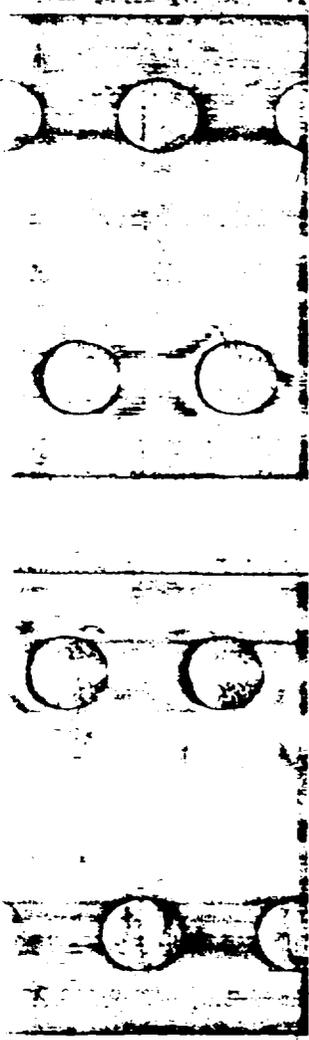
COMMONWEALTH
DEPARTMENT OF ENVIRONMENTAL AFFAIRS
DIVISION OF MASSACHUSETTS
ACUSHNET RIVER
MASSACHUSETTS

Ref: 95A

RESULTS OF SEDIMENT SAMPLE ANALYSES
FOR PCB'S IN NEW BEDFORD HARBOR

July and October 1981
Gerald Szal, DWPC, Westboro

Chemical Analysis by Cambridge Analytical Associates



(#-F)	CAA NO	STATION NO.	DATE	TYPE OF SAMPLE	DEPTH OF SAMPLE (inches)	PCB CONCENTRATION (ppm wet wt.)		% DRY WEIGHT
						1248	1254	
625	I	a	7/21	Pd	approx. 0-4	34	34	70
640		a'	7/22	sc	0-4	35	--	*
641		a'	7/22	sc	4-8	1.4	--	*
624		b	7/21	Pd	approx. 0-4	14	18	78
633		c	7/21	Pd	" "	230	200	71
637		c'	7/22	sc	0-4	1300	--	*
638		c'	"	sc	4-8	100	--	67
639		c'	"	sc	8-12	10	--	*
642	II	a	"	sc	0-4	1140	--	*
630		a'	"	Pd	approx. 0-4	130	--	43
640		b	"	"	0-4	670	--	*
631		b'	"	Pd	approx. 0-4	1080	--	41
643		c	"	"	0-4	460	--	*
644		c	"	"	4-8	10	--	*
645		c	"	"	8-12	4.0	--	17
647	III	a	"	"	0-4	2300	--	*
648		a'	"	"	4-8	100	--	*
649		b	"	"	0-4	500	--	*
632		b'	"	Pd	approx. 0-4	1300	--	42
649		c	"	"	0-4	150	--	67
650		c	"	"	4-8	5.6	--	*
651		c	"	"	8-12	3.6	--	52
634	IV	a	"	"	0-4	190	--	*
636		a'	"	Pd	approx. 0-4	135	--	33
655		b	7/23	"	0-5	460	--	36
656		b	"	"	5-9 1/2	60	--	46
657		b	"	"	9 1/2-14	1.5	--	48
653		c	"	"	0-5	36	--	79
654		c	"	"	5-10	.02	--	74
658	V	a	"	"	0-7	80	--	38
659		a	"	"	15-22	0.8	--	42
660		b	"	"	0-7	30	--	41
661		b	"	"	7-14	1.0	--	46
662		c	"	"	0-8	34	--	38
663		c	"	"	8-16	70	--	44
664		d	"	"	0-7	4.2	4.4	*
665		d	"	"	7-14	100	26	*

Results of Sediment Sampling Analyses
For PCB's in New Bedford Harbor (Cont.)

STATION NO.	DATE	OF SAMPLE	DEPTH OF SAMPLE (inches)	PCB CONCENTRATION (ppm wet wt.)		% DRY WEIGHT	
				1248	1254		
666	VI	a 810724-22 "	"	0-6½	170	22	*
667		a -23 "	"	6½-13	1.3	--	*
668		b -24 "	Pd	approx. 0-4	12	--	*
669		c -25 "	"	"	8.0	--	*
677	VII	a 810729-13 7/28	1c	0-4	12	5.3	*
678		b -14 "	"	"	8.0	3.6	*
679		c -16 "	"	"	13	10	40
680	VII.1a	-17 "	"	"	11	3.3	*
681	b	-18 "	"	"	24	34	39
682	c	-19 "	"	"	10	13	35
712	VIII	a 811005-34A 10/2	"	"	6.7	7.0	45
713		b 811005-35A "	"	"	7.5	6.0	37
711	IX	a 811005-33A 10/2	"	"	0.1	0.3	64
710		b 811005-32A "	"	"	5.0	5.6	63
709		c 811005-31A "	"	"	7.6	6.5	48
675	X	b 810721-11 7/28	"	"	8.6	13	*
676		a 810721-12 "	"	"	5.4	2.3	*
626	XI	a 810722-7 7/21	Pd	approx. 0-4	1.1	2.4	73
627		b 810722-8 "	"	"	2.3	3.7	69
628		c 810722-9 "	"	"	0.9	0.69	68
629		d 810722-10 "	"	"	2.6	2.4	57
707	XII	a 811005-21A 10/2	1c	0-4	1.8	2.8	62
708		b 811005-20A "	"	"	4.2	4.0	59
706		c 811005-19A "	"	"	1.4	3.2	57
1327	XIIIa	811005-21A 10/2	"	"	25	5.5	50
705	b	811005-20A 10/2	"	"	23	6.2	55
670	XIV	a 810721-1 7/28	"	"	--	--	*
701		a 811005-22A 10/1	"	"	6.4	6.8	64
671		b 810721-2 7/28	"	"	5.0	5.7	52
699		b 811005-20A 10/1	"	"	1.2	1.5	64
672		c 810721-3 7/28	"	"	1.4	3.3	*
700		c 811005-21A 10/1	"	"	0.6	6.6	69
673	XV	a 810721-4 7/28	"	"	2.6	3.2	*
702		a 811005-21A 10/2	"	"	2.0	5.0	65
674		b 810721-7 7/28	"	"	0.7	4.4	*
703		b 811005-21A 10/2	"	"	4.5	2.0	68

Results of Sediment Sampling Analyses
For PCB's in New Bedford Harbor (Cont.)

STATION NO.	DATE	TYPE OF SAMPLE	DEPTH OF SAMPLE (inches)	PCB CONCENTRATION (ppm wet wt.)		% DRY WEIGHT		
				1248	1254			
652	XV c	B10729-9	7/28	1c	0-4	5.5	4.0	*
704	c'	B11005-2A	10/2	"	"	2.1	3.0	67
683	XVI a	B10724-70	7/27	"	"	9.0	14	43
684	b	-22	"	"	"	--	15	57
685	c	-24	"	"	"	3.4	22	50
698	c'	B11005-19A	10/1	"	"	3.4	4.7	*
696	XVII a	B10724-27	7/27	"	"	1.3	45	50
695	a'	B11005-16A	10/1	"	"	7.0	16	42
687	b	B10724-29	7/27	"	"	7.7	25	50
696	b'	B11005-17A	10/1	"	"	2.5	7.3	76
698	c	B10724-27	7/27	"	"	3.0	4.0	65
697	c'	B11005-16A	10/1	"	"	2.2	1.8	62
691	XVIII a	B11005-12A	10/1	"	"	0.7	1.1	68
692	b	"-13A	10/1	"	"	0.5	1.2	69
690	a'	B10729-22	7/27	"	"	1.7	2.2	74
693	c	B11005-14A	10/1	"	"	0.3	0.4	81
694	c'	"-12A	"	"	"	0.2	0.5	61

Legend:

- Pd = Peterson dredge
- sc = 24" hand-held core
- 1c = winch-operated 4' core

Note: An apostrophe after a station represents a second sample taken at that station.

$$\% \text{ Dry Weight} = \frac{\text{dry weight (g)}}{\text{wet weight (g)}} \times 100$$

*insufficient volume of sample to calculate % dry weight

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RESULTS OF ~~ANALYSES~~ ANALYSES
FOR PCB's IN NEW BEDFORD HARBOR

Page 95a

July and October 1981

Gerald Szal, DWPC, Westboro

Chemical Analysis by Cambridge Analytical Associates

STATION NO.	DATE	TYPE OF SAMPLE	DEPTH OF SAMPLE (inches)	PCB CONCENTRATION (ppm wet wt.)		
				1248	1254	
I	a	7/21	Pd	approx. 0-4	34	34
	a'	7/22	sc	0-4	35	--
	a'	7/22	sc	4-8	1.4	--
	b	7/21	Pd	approx. 0-4	14	18
	c	7/21	Pd	" "	230	200
	c'	7/22	sc	0-4	1300	--
	c'	"	sc	4-8	100	--
	c'	"	sc	8-12	10	--
	II	a	"	sc	0-4	1140
a'		"	Pd	approx. 0-4	130	--
b		"	"	0-4	670	--
b'		"	Pd	approx. 0-4	1080	--
c		"	"	0-4	460	--
c		"	"	4-8	10	--
c		"	"	8-12	4.0	--
III	a	"	"	0-4	2300	--
	a	"	"	4-8	100	--
	b	"	"	0-4	500	--
	b'	"	Pd	approx. 0-4	1300	--
	c	"	"	0-4	150	--
	c	"	"	4-8	5.6	--
	c	"	"	8-12	3.6	--
IV	a	"	"	0-4	190	--
	a'	"	Pd	approx. 0-4	135	--
	b	7/23	"	0-5	460	--
	b	"	"	5-9½	60	--
	b	"	"	9½-14	1.5	--
	c	"	"	0-5	36	--
	c	"	"	5-10	.02	--
V	a	"	"	0-7	80	--
	a	"	"	15-22	0.8	--
	b	"	"	0-7	30	--
	b	"	"	7-14	1.0	--
	c	"	"	0-8	34	--
	c	"	"	8-16	70	--
	d	"	"	0-7	4.2	4.4
	d	"	"	7-14	100	26

Results of Sediment Sampling Analyses
For PCB's in New Bedford Harbor (Cont.)

STATION NO.	DATE	OF SAMPLE	DEPTH OF SAMPLE (inches)	PCB CONCENTRATION (ppm wet wt.)	
				1248	1254
VI a	"	"	0-6½	170	22
a	"	"	6½-13	1.3	--
b	"	Pd	approx. 0-4	12	--
c	"	"	"	8.0	--
VII a	7/28	1c	0-4	12	5.3
b	"	"	"	8.0	3.6
c	"	"	"	13	10
VII.1a	"	"	"	11	3.3
b	"	"	"	24	34
c	"	"	"	10	13
VIII a	10/2	"	"	6.7	7.0
b	"	"	"	7.5	6.0
IX a	10/2	"	"	0.1	0.3
b	"	"	"	5.0	5.6
c	"	"	"	7.6	6.5
X b	7/28	"	"	8.6	13
a	"	"	"	5.4	2.3
XI a	7/21	Pd	approx. 0-4	1.1	2.4
b	"	"	"	2.3	3.7
c	"	"	"	0.9	0.69
d	"	"	"	2.6	2.4
XII a	10/2	1c	0-4	1.8	2.8
b	"	"	"	4.2	4.0
c	"	"	"	1.4	3.2
XIIIa	10/2	"	"	25	5.5
b	10/2	"	"	23	6.2
XIV a	7/28	"	"	--	--
a'	10/1	"	"	6.4	6.8
b	7/28	"	"	5.0	5.7
b'	10/1	"	"	1.2	1.5
c	7/28	"	"	1.4	3.3
c'	10/1	"	"	0.6	6.6
XV a	7/28	"	"	2.6	3.2
a'	10/2	"	"	2.0	5.0
b	7/28	"	"	0.7	4.4
b'	10/2	"	"	4.5	2.0

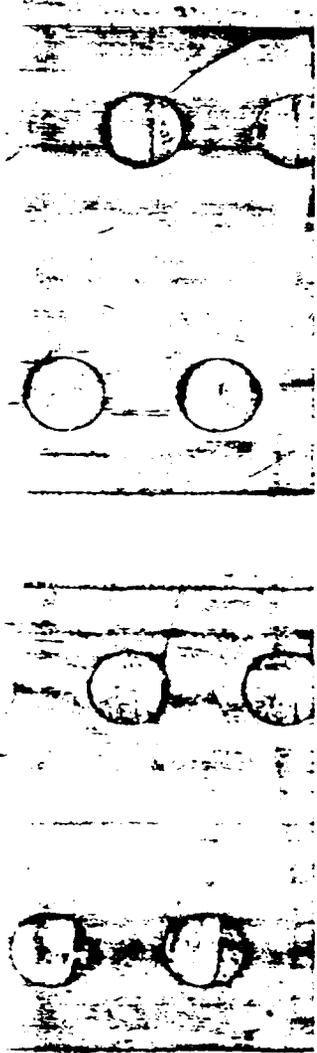
Results of Sediment Sampling Analyses
For PCB's in New Bedford Harbor (Cont.)

STATION NO.	DATE	TYPE OF SAMPLE	DEPTH OF SAMPLE (inches)	PCB CONCENTRATION (ppm wet wt.)	
				1248	1254
XV c	7/28	1c	0-4	5.5	4.0
	10/2	"	"	2.1	3.0
XVI a	7/27	"	"	9.0	14
	"	"	"	--	15
	"	"	"	3.4	22
	10/1	"	"	3.4	4.7
XVII a	7/27	"	"	1.3	45
	10/1	"	"	7.0	16
	7/27	"	"	7.7	25
	10/1	"	"	2.5	7.3
	7/27	"	"	3.0	4.0
	10/1	"	"	2.2	1.8
XVIII a	10/1	"	"	0.7	1.1
	10/1	"	"	0.5	1.2
	7/27	"	"	1.7	2.2
	10/1	"	"	0.3	0.4
"	"	"	"	0.2	0.5

Legend:

- Pd = Peterson dredge
- sc = 24" hand-held core
- 1c = winch-operated 4' core

Note: An apostrophe after a station represents a second sample taken at that station.



RUNAL CEMETERY

FAIR HAVEN

RFI 154
100 1 1 2

Request By: W. Leigh Bridges
Date: 6/20/80

ANALYTIC CHEMISTRY REPORT

U.S. v. AVX Original Litigation Document

Sample Name or Code: Lobsters
Analysis For: PCB's
Methods Used: G.C. (E.C.)

No. of Analyses: 16 (see attached sheet) *Entered 1-1-81*

Results:	Lab No.	Specimen	Location	PCB (ppm) wet wt.*
			(New Bedford)	
	P318	Lobster	UU-80-1	0.45
	P322	"	UU-80-3	4.63
	P321	"	UU-80-6	6.66
	P320	"	UU-80-4	5.66
	P323	"	VV-80-1	0.46
	P319	"	VV-80-3	4.79
	P301	"	YY-80-1	3.24

Comments: *Results indicated are lower than actual PCB levels due to excessive decay prior to extractions.

Date: 8/13/80
Title: Supplemental Report
Chemist: _____

127 154

P.C.C. 2-1-1

Request By: W. Leigh BridgesDate: 6/20/80ANALYTIC CHEMISTRY REPORTSample Name or Code: LobstersAnalysis For: PCB'sMethods Used: G.C. (E.C.)No. of Analyses: 16 (see attached sheet)E. D. 21-11-80

Results:	Lab. No.	Specimen	Location	PCB (ppm)	wet wt.*
	P312	Lobster	(New Bedford) VV-80-2	1.66	
	P300	"	UU-80-5	1.40	
	P302	"	KKK-80-1	5.64	
	P299	"	UU-80-2	1.13	
	P313	"	ZZ-80-3	3.18	
	P314	"	ZZ-80-4	0.54	
	P315	"	ZZ-80-2	0.61 0.57	
	P316	"	WW-80-3	7.06 6.06	
	P317	"	KKK-80-2	0.65	

Comments: *Results indicated are lower than actual PCB levels due to excessive decay prior to extractions

Date: 8/13/80

Timothy Cunningham & William Herbert
Chemist

Request By: Leigh Bridges

Date: 7/7/80

ANALYTIC CHEMISTRY REPORT

Sample Name or Code: Lobster

Analysis For: PCBs

Methods Used: G.C. (E.C.)

No. of Analyses: 9

Results: Lab No.	Specimen	Location	PCBs (ppm)	ppb
P303	Lobster	YY-80-2	17'	2.93
P304	Lobster	YY-80-3		5.18 271
P305	Lobster	KKK-80-3		5.47 201
P306	Lobster	JJJ-80-1		4.26
P307	Lobster	JJJ-80-2		5.45
P308	Lobster	JJJ-80-3		7.61 301
P309	Lobster	MMM-80-1		6.05
P310	Lobster	MMM-80-2		4.74 211
P311	Lobster	MMM-80-3		2.65 101

Comments: _____

Date: 7/25/80

Timothy Cunningham
Analyst Chemist

NEW BEDFORD LITIGATION DOCUMENT

Request By: Leigh Bridges (DMF)

Date: 7/4/80

ANALYTIC CHEMISTRY REPORT

Sample Name or Code: Lobsters, Tautog (New Bedford)

Analysis For: PCB's

Methods Used: G.C. (E.C.)

No. of Analyses: 13

Results: Lab No.	Specimen	Location	PCB's (ppm) wet wt.
P324	Lobster	VV-80-4	4.06
P325	Lobster	VV-80-5	1.44
P326	Lobster	VV-80-6	2.02 307
P327	Lobster	ZZ-80-5	2.58
P328	Lobster	ZZ-80-6	2.04
P329	Lobster	ZZ-80-7	4.70 314
P331	Lobster	KKK-80-4	11.03
P332	Lobster	KKK-80-5	3.83 312
P333	Lobster	UU-80-7	2.14
P334	Lobster	UU-80-8	3.27
P335	Lobster	UU-80-9	3.10 311
P336	Lobster	KKK-80-6	2.43 310
P337	Tautog	No Number	0.25

Comments:

Date: 8/31/80

Timothy Cunningham
Chemist

251 157

#2

Request By: W. L. Bridges

Date: June, 1982

ANALYTIC CHEMISTRY REPORT

Sample Name or Code: Lobster--New Bedford sites S and T

Analysis For: PCB

Methods Used: G.C.-E.C.

No. of Analyses: 4

Results:	Sample #	PCB (in ppm)
	S-82-1	1.8
	S-82-2	3.0
	T-82-1	8.5
	T-82-2	3.6

Comments: _____

Date: November 1, 1982

Jean Schlosstein
Chemist

Request By: W. L. Bridges

Date: _____

ANALYTIC CHEMISTRY REPORT

Sample Name or Code: Flounder samples - Fall River

Analysis For: PCB

Methods Used: GC - EC

No. of Analyses: 9

Results: Lab#	Field #	PCB (in ppm)
P535	FR-82-1	trace *
P536	FR-82-2	trace
P537	FR-82-3	trace
P538	FR-82-4	trace
P539	FR-82-5	trace
P540	FR-82-6	trace
P541	FR-82-7	trace
P542	FR-82-8	trace
P543	FR-82-9	trace

Comments: *trace amounts less than 0.01 ppm

Date: December 8, 1982

Joan Schlosstein
Chemist

Request By: W. L. Bridges

Date: _____

ANALYTIC CHEMISTRY REPORT

Sample Name or Code: Flounder samples - Fall River

Analysis For: PCB

Methods Used: GC - EC

No. of Analyses: 9

<u>Lab #</u>	<u>Field #</u>	<u>PCB (in ppm)</u>
<u>P544</u>	<u>FR-82-10</u>	<u>trace *</u>
<u>P545</u>	<u>FR-82-11</u>	<u>trace</u>
<u>P546</u>	<u>FR-82-12</u>	<u>trace</u>
<u>P547</u>	<u>FR-82-13</u>	<u>trace</u>
<u>P548</u>	<u>FR-82-14</u>	<u>trace</u>
<u>P549</u>	<u>FR-82-15</u>	<u>trace</u>
<u>P550</u>	<u>FR-82-16</u>	<u>trace</u>
<u>P551</u>	<u>FR-82-17</u>	<u>trace</u>
<u>P552</u>	<u>FR-82-18</u>	<u>trace</u>

Comments: *trace amounts less than 0.01 ppm

Date: December 8, 1982

Joan Schlosstein
Chemist

Request By: W. L. Bridges

Date: _____

ANALYTIC CHEMISTRY REPORT

Sample Name or Code: Flounder samples - Fall River

Analysis For: PCB

Methods Used: GC - EC

No. of Analyses: 9

Results: Lab #	Field #	PCB (in ppm)
<u>P553</u>	<u>FR-82-19</u>	<u>trace *</u>
<u>P554</u>	<u>FR-82-20</u>	<u>trace</u>
<u>P555</u>	<u>FR-82-21</u>	<u>trace</u>
<u>P556</u>	<u>FR-82-22</u>	<u>trace</u>
<u>P557</u>	<u>FR-82-23</u>	<u>trace</u>
<u>P558</u>	<u>FR-82-24</u>	<u>trace</u>
<u>P559</u>	<u>FR-82-25</u>	<u>trace</u>
<u>P560</u>	<u>FR-82-26</u>	<u>trace</u>
<u>P561</u>	<u>FR-82-27</u>	<u>trace</u>

Comments: *trace amounts less than 0.01 ppm

Date: December 8, 1982

Joan Schlosstein
Chemist