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Gould Island, McAllister Point & Allen Harbor

Sediment & Mussel Sampling

January 1988

Prepared By
The Water Quality Laboratory
Engineering Division

Department of the Army
New England Division, Corps of Engineers
Hubbardston, Massachusetts

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Introduction

This report discusses the sampling survey, including methods and procedure, which was conducted at the Naval Education Center, Gould Island and McAllister Point, RI, and Allen Harbor, U.S. CBC, Davisville, RI.

Gould Island and McAllister Point were sampled on January 19th and 20th respectively. Allen Harbor was sampled on March 2nd and 3rd.

All sampling was planned and conducted by the U.S. Army Corps of Engineers, New England Division, Water Quality Laboratory personnel.

The original scope of work for this project requested three (3) sediment and three (3) soft shell clam samples from Gould Island, six (6) sediment and six (6) soft shell clam samples from McAllister Point and six (6) sediment and six (6) soft shell clam samples from Allen Harbor. Because of the logistics involved in coordinating transportation to Gould Island, the field personnel decided to take six (6) sediment and clam samples at Gould Island to insure that an adequate amount of material was available to the analyst in the event of future request for more analysis. Seven (7) sediment and clam samples were taken from the McAllister Point locus. Six samples were taken from McAllister Point and one sample, to be used as a control sample, was taken at a distance of 895 feet north of sample #6. Sample point number 7 is outside the immediate area affected by the dump site. Six sediment and clam samples were taken at Allen Harbor.

The total number of sampling points for the three sample locations, Gould Island, McAllister Point and Allen Harbor, is nineteen (19). Weather conditions during the sampling effort are recorded on Table 3.

Purpose

The purpose of this sampling effort was to fulfill the request by the Dept. of the Navy, Naval Education Center, Newport, RI. For an interim study of Gould Island, McAllister Point and Allen Harbor. The interim study is to be utilized to assist in the characterization of chemical and biological conditions in the above mentioned locations.

Gould Island and McAllister Point, Sediment Sampling

Well defined sedimentary deposits could not be found at Gould Island and McAllister Point. The material which was sampled at these locations is considered beach sand. There appears to be a vigorous scouring of the beach at both sites, due to current, wave and tidal action.

Samples were taken in the inter-tidal zone and sampling began approximately one hour before low tide and seized at the approximate time of low tide to one (1) hour after low tide. Refer to Table 1.

At Gould Island seven wooden stakes were set over a linear distance of four hundred and fifty (450') feet. Stake number one (1) being the southern-most stake and stake number seven (7) being the northern-most stake. Stake number one was placed approximately twenty (20) feet north of the abandoned peer, and subsequent stakes were set sixty five feet (65') apart. Stakes were set in the soil east of the winter tidal berm at the toe of the embankment.

At McAllister Point eight (8) wooden stakes were set over a linear distance of eleven hundred (1100) feet. Stake number one was set one hundred and seventy (170) feet Northwest of the fence post on the edge of the embankment. This fence post is the western-most post of the section of fence which runs perpendicular between the beach and the railroad track. Stake number one was set at the toe of the bank, east of the winter tidal berm. All subsequent stakes were set one hundred and fifty (150) feet apart, at the break of the bank or immediately above the riprap, with the exception of stake number eight which was set two hundred (200) feet north of stake number seven (7). Two concrete blocks used as anchors for the utility pole guide wires were used as reference points for sample number seven.

All samples were taken as close to the waters edge as possible during the low tide period (See table 1). A linear distance from the sample hole to two points (stakes) was measured after the sample was taken. Refer to table 2 for distances from sample points to stakes.

The original intent of this sampling survey was to sample a core of sediment from a depth of one (1) foot. However, due to the natural and man made conditions of this site, any attempt to obtain a core sample without the facility of an elaborate hydraulic or electric coring device is impractical.

Sample holes were dug with a steel garden shovel and a crow bar. A sample depth of twelve inches was not attainable because of the presence of large stones, boulders, debris from the dump site and water infiltration. All sample material was taken at a depth of four (4) inches to eight (8) inches.

After the sample hole was dug a stainless steel spoon was used to clean out the hole. The inside of the hole was swiped with the spoon from a depth of 4"-8" to obtain the sample. The samples were placed in wide mouth amber glass jars, cleaned to EPA protocols, with teflon lined closures. The jars were appropriately labeled, placed in coolers and iced.

All tools and sampling devices were appropriately washed with hexane after the sampling of each hole. The hexane was collected in a tray, poured off in a teflon bottle and returned to the Water Quality Laboratory for proper disposal.

Allen Harbor, Sediment Sampling

An established sedimentary horizon exists in Allen Harbor in the tidal flats and at the toe of the landfill below mean low water.

A coring device as shown in figure 3 was used to obtain sediment samples, at the required depth of 9"-15", from all six (6) sample locations in Allen Harbor.

Sampling began approximately two (2) hours before low tide and was completed one (1) hour after low tide on March 2, 1988, reference Table 4.

Sample numbers 2 through 6 were taken from a boat and, sample area number 1 was accessed by foot. All samples remained undisturbed in the original tube used to push the core. The tube was immediately cut, capped, and placed in a cooler, on ice. Reference Figure No. 4 for sample site locations.

Allen Harbor, Clam Sampling

Six clam samples were taken from Allen harbor on March 3, 1988. Five of the samples consist of hard shell clams which were raked from the harbor bottom in the areas of sample points 2-6. Soft shell and hard shell clams were taken from the area of sample #1, which is an exposed tidal flat during periods of low tide.

The clams were kept alive in containers filled with seawater from Allen Harbor and transported to the Water Quality Laboratory. Reference Figure No. 4 for sample site locations.

Gould Island and McAllister Point, Mussel Sampling

Mussels were collected by hand within a fifteen (15) to twenty (20) foot radius of the sample hole. All blue mussels collected were approximately 2" in length. Approximately 25-30 mussels were collected from each sample hole area. They were placed (live) in zip lock plastic bags, sealed, placed in coolers and kept on ice until they were returned to the laboratory and froze.

Chain of Custody

A chain of custody record was kept for all samples which were collected on January 19th and 20th. All samples were under the custody of a sample crew member and kept in a locked utility van at all times. Upon arrival at the Water Quality Laboratory, Hubbardston, MA, the samples were immediately placed and locked in the laboratory's walk in cooler and chest freezer. The samples were relinquished to the laboratory's sample custodian on the morning of January 21, 1988. Chain of custody record is enclosed with this report (Appendix A).

Table No. 1
Gould Island Sample Site Locations and Time of Sampling*

Sample Site No.	Stake Numbers	Distance from stake to hole	Compass Direction of sample from stakes	Time of sample
1	1	57'	W N/W	1245
	2	65'	S/W	
2	1	78'	N/W	1256
	2	48'	W	
3	2	69'	N/W	1304
	3	39'	W S/W	
4	3	73'	N/W	1313
	4	26'	W	
5	4	71'	N/W	1324
	5	19'	W S/W	
6	6	50'	W N/W	1357
	7	24'	W S/W	

* Low Tide, January 19th, 1988, 1332 hrs
Tide tables taken from, Tide Tables 1988 East Coast of North America, U.S. Department of Commerce, NOAA

Table No. 2
McAllister Point Sample Site Locations and Time of Sampling*

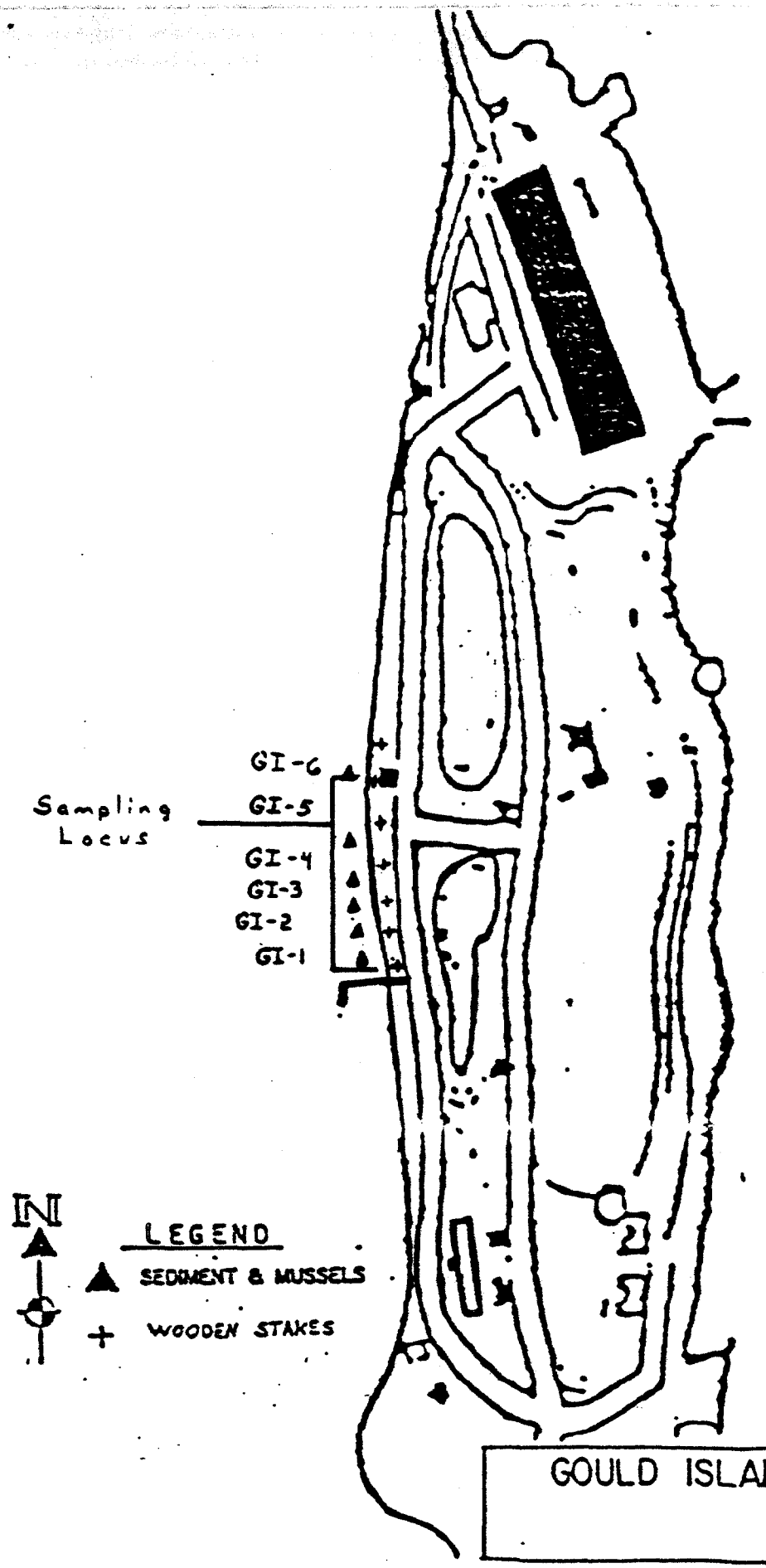
Sample Site No.	Stake Numbers	Distance from stake to hole	Compass Direction of sample from stakes	Time of sample
1	1	67'	W	1530
	Fence Post	207'	N/W	
2	1	150'	N/W	1500
	2	47'	N/W	
3	3	142'	N/W	1440
	4	38'	W	
4	4	122'	N/W	1420
	5	46'	W	
5	5	126'	N/W	1400
	6	49'	S/W	
6	6	146'	N/W	1340
	7	26'	W	
7	Anchors for guide wires	57'	W N/W	1317
		[illegible]	N/W	

* Low tide, January 20th, 1988, 1420 hrs

Table No. 3
Weather Conditions During Sampling Activity

Weather conditions on the sampling dates were as follows:

	Clear	Overcast	Rain	Temp.	Wind Velocity
January 19th	*	-	-	20-30°F	10-15 mph
January 20th	-	*	Heavy	34-38°F	5-10 mph
March 2nd	*	-	-	45°F	$\leq$ 5 mph
March 3rd	-	*	-	45-50°F	0



GOULD ISLAND DISPOSAL AREA

NOT TO SCALE

JAN. 22, 1988

FIG. NO. 1

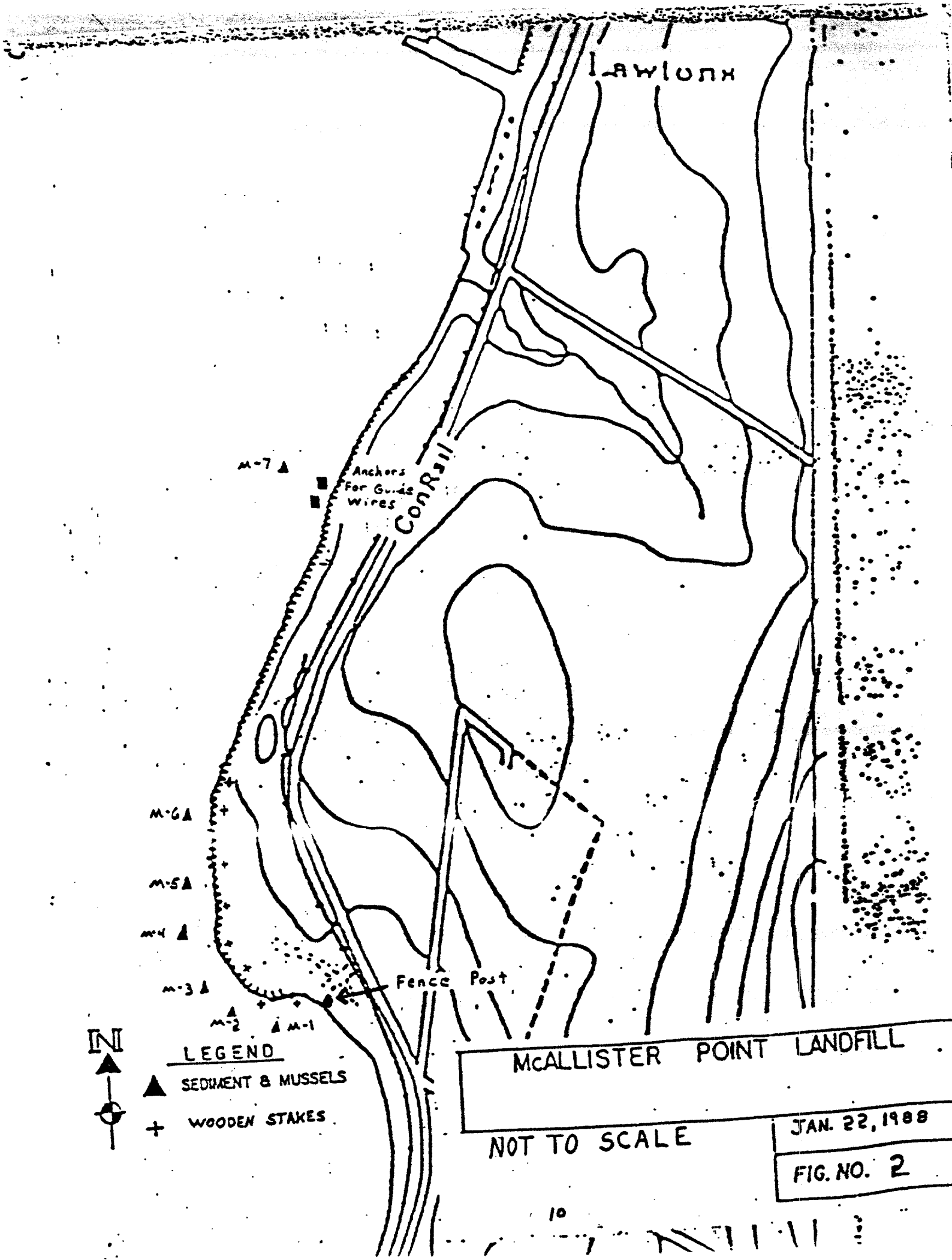
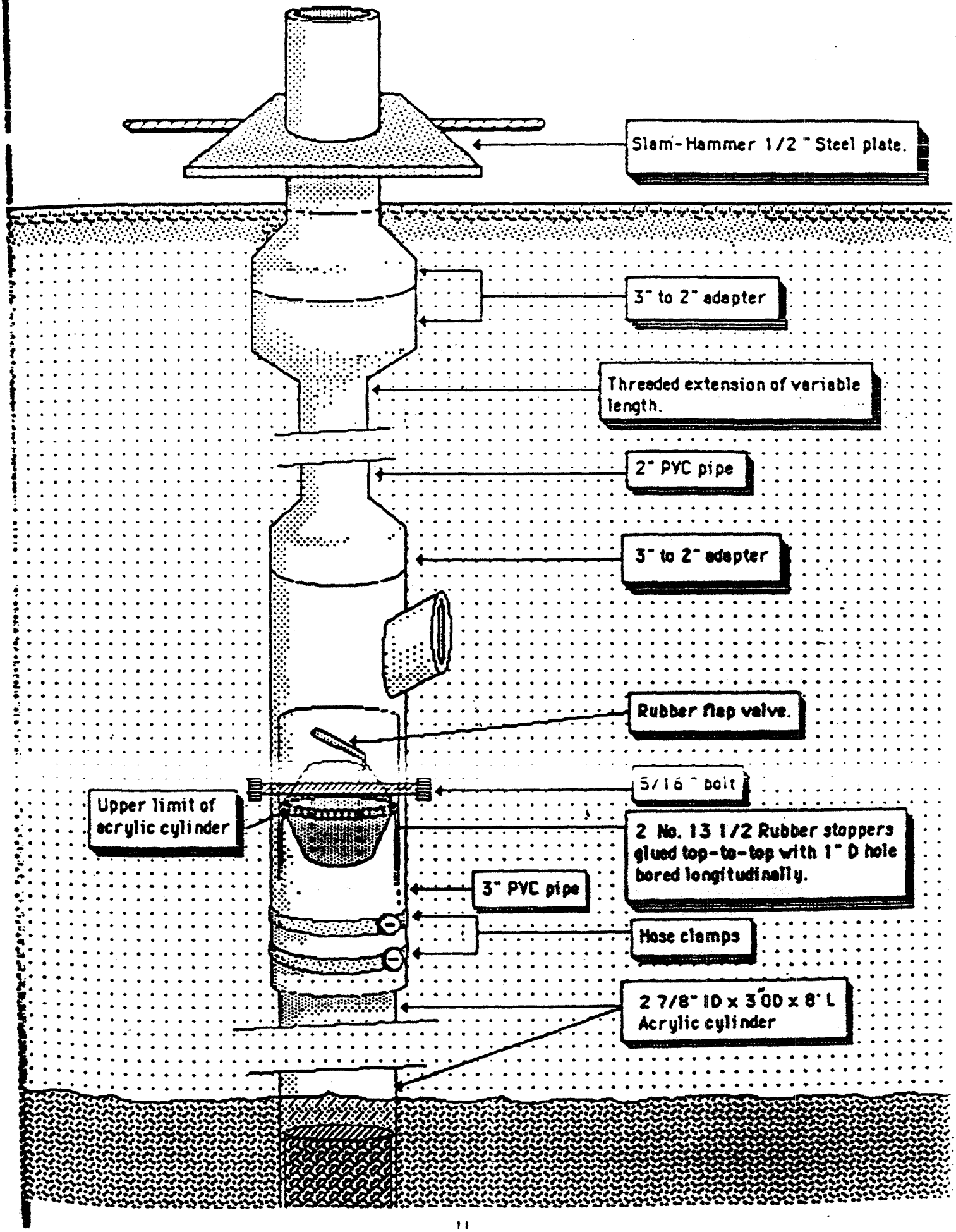
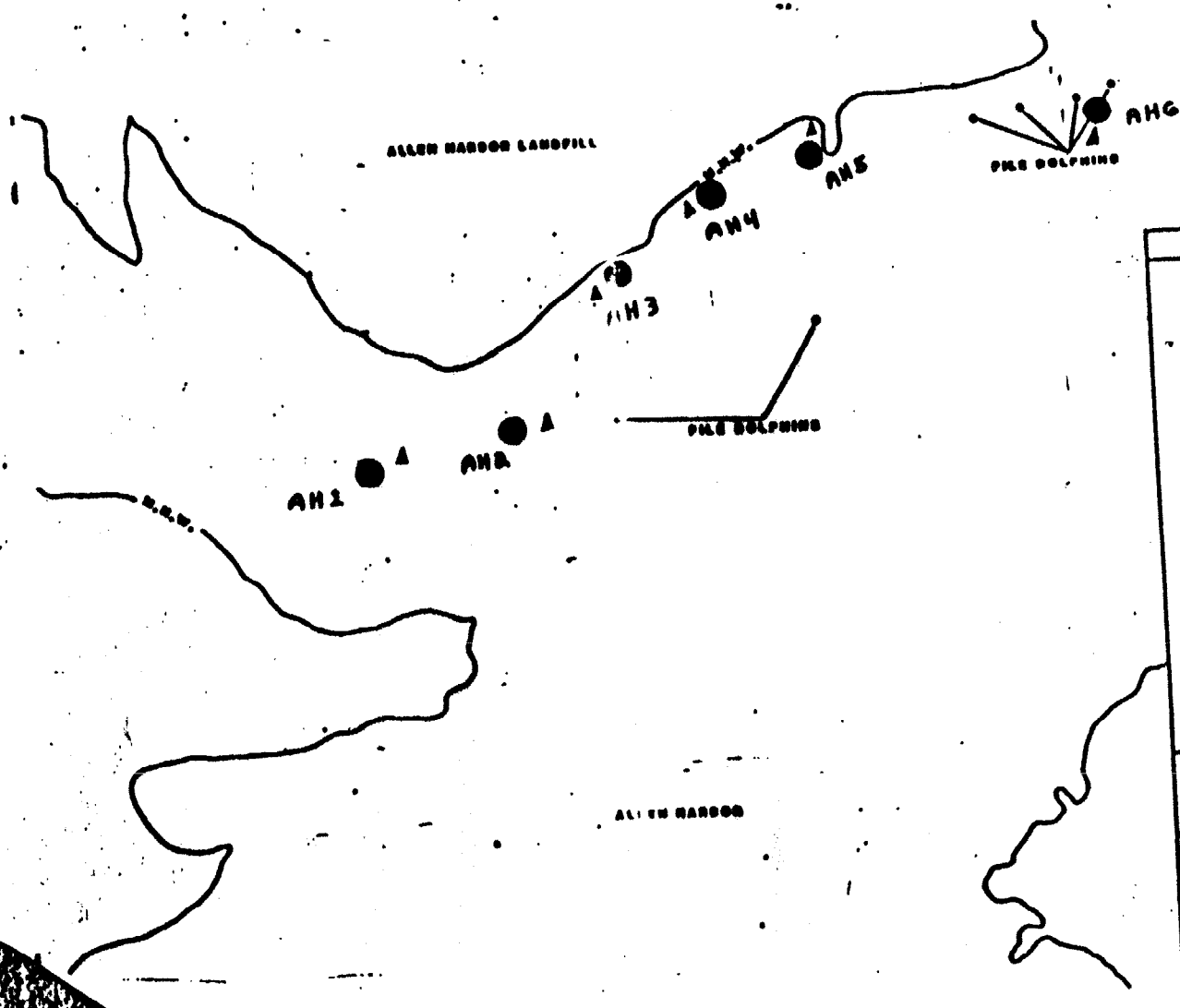

Lawlonx
ConRail
Anchors For Guide Wires
M-7
M-6
M-5
M-4
M-3
M-2
M-1
Fence Post
N
LEGEND
SEDIMENT & MUSSELS
WOODEN STAKES
McALLISTER POINT LANDFILL
NOT TO SCALE
JAN. 22, 1988
FIG. NO. 2

FIGURE 3


Slam-Hammer 1/2" Steel plate.
3" to 2" adapter
Threaded extension of variable length.
2" PVC pipe
3" to 2" adapter
Rubber flap valve.
5/16" bolt
Upper limit of acrylic cylinder
2 No. 13 1/2 Rubber stoppers glued top-to-top with 1" D hole bored longitudinally.
3" PVC pipe
Hose clamps
2 7/8" ID x 3"OD x 8' L Acrylic cylinder



LEGEND

▲ SEDIMENT SAMPLE LOCATION

● CLAM SAMPLE LOCATION

NAVAL CONSTRUCTION BATTALION CENTER
DAVISVILLE, RHODE ISLAND

FIGURE 4
SAMPLING LOCATION PLAN
SITE - ALLEN HARBOR LANDFILL

CHAIN OF CUSTODY RECORD

PROJ. NO.

PROJECT NAME: Allen Harbor

SAMPLERS: (Signature) Paul Spano / Nancy L. Amsden

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	Metals: Cd, Cr, Cu, Ni, Pb, Zn	PCBs	Total Petroleum Hydrocarbons				REMARKS
AHS #1	3-2-88				Refer to Allen Harbor Sample location Plan	1	✓	✓	✓				1 Tube of sediment
AHS #2	3-2-88				" "	1	✓	✓	✓				" "
AHS #3	3-2-88				" "	1	✓	✓	✓				" "
AHS #4	3-2-88				" "	1	✓	✓	✓				" "
AHS #5	3-2-88				" "	1	✓	✓	✓				" "
AHS #6	3-2-88				" "	1	✓	✓	✓				" "
AHC #1	3-3-88				" "	3	✓	✓	✓				1 doz. soft shell clams "
AHC #1	3-3-88				" "	3	✓	✓	✓				1 doz. Quahogs
AHC #2	3-3-88				" "	4	✓	✓	✓				1 doz. Quahogs
AHC #3	3-3-88				" "	2	✓	✓	✓				" "
AHC #4	3-3-88				" "	2	✓	✓	✓				" "
AHC #5	3-3-88				" "	4	✓	✓	✓				" "
AHC #6	3-3-88				" "	3	✓	✓	✓				" "

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Paul J. Spano	3-4-88 0800	Patricia Gonade			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

Appendix H

U.S. ARMY CORPS OF ENGINEERS

CHAIN OF CUSTODY RECORD

PROJ. NO.

PROJECT NAME: Goulds Is. + McAllister Point R.I.

SAMPLERS: (Signature) Paul A. Spano, Nancy Y. Amida

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	Metals: Cd, Cr, Cu, Ni, Pb, Zn	PCBs	Total Petroleum Hydrocarbons				REMARKS
GI1	01-19-88	1245		✓	Newport Goulds Is. #1 see sample plan	2	✓	✓	✓				1 bottle of soil, 1 bag of mussels
GI2		1256		✓	" " #2	2	✓	✓	✓				1 bottle of soil, 1 bag of mussels
GI3		1304		✓	" " #3	2	✓	✓	✓				" "
GI4		1313		✓	" " #4	2	✓	✓	✓				" "
GI5		1324		✓	" " #5	2	✓	✓	✓				" "
GI6		1337		✓	" " #6	2	✓	✓	✓				" "
M-1	01-20-88	1530		✓	McAllister Point #1	2	✓	✓	✓				1 bottle of soil, 1 bag of Mussels
M-2		1500		✓	" " #2	2	✓	✓	✓				" "
M-3		1440		✓	" " 3	2	✓	✓	✓				" "
M-4		1420		✓	" " 4	2	✓	✓	✓				" "
M-5		1400		✓	" " 5	2	✓	✓	✓				" "
M-6		1340		✓	" " 6	2	✓	✓	✓				" "
M-7		1317		✓	" " 7	2	✓	✓	✓				" "

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Paul A. Spano	01/21/88 0800	RW Gamache			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

NEW ENGLAND DIVISION WATER QUALITY LABORATORY

REPORT PRODUCED ON 08/24/88 14:07:47

GOULD ISLAND, MCALLISTER POINT AND ALLENS HARBOR
SEDIMENT SAMPLES
Negative values are detection limits and indicate that substance was not detected.

SAMPLE	FIELD DESCRIPTION	Cd (ppm)	Cr (ppm)	Cu (ppm)	Ni (ppm)	Pb (ppm)	Zn (ppm)
3316	GI #1 - SEE PLAN	-2.0	18.0	151.0	-29.0	168.0	126.0
3317	GI #2 - SEE PLAN	3.0	16.0	308.0	-29.0	335.0	253.0
3318	GI #3 - SEE PLAN	6.0	35.0	738.0	31.0	2080.0	251.0
3319	GI #4 - SEE PLAN	3.0	32.0	2270.0	-29.0	1520.0	285.0
3320	GI #5 - SEE PLAN	15.0	34.0	7400.0	37.0	2270.0	515.0
3321	GI #6 - SEE PLAN	-2.0	13.0	160.0	-29.0	126.0	73.0
3322	MP #1 - SEE PLAN	3.0	57.0	1370.0	1340.0	3130.0	2440.0
3323	MP #2 - SEE PLAN	-2.0	69.0	556.0	90.0	814.0	814.0
3324	MP #3 - SEE PLAN	11.0	98.0	25000.0	225.0	4410.0	2410.0
3325	MP #4 - SEE PLAN	12.0	94.0	1220.0	154.0	2290.0	1790.0
3326	MP #5 - SEE PLAN	7.0	2190.0	2810.0	1310.0	587.0	587.0
3327	MP #6 - SEE PLAN	8.0	86.0	3981.0	440.0	3680.0	1760.0
3328	MP #7 - SEE PLAN	-2.0	11.0	16.0	33.0	16.0	67.0
3396	AHS #1 - SEE PLAN	-2.0	10.0	14.0	-30.0	-15.0	39.0
3397	AHS #2 - SEE PLAN	-2.0	10.0	19.0	-30.0	28.0	46.0
3398	AHS #3 - SEE PLAN	3.0	27.0	233.0	42.0	249.0	916.0
3399	AHS #4 - SEE PLAN	5.0	58.0	431.0	106.0	452.0	1290.0
3400	AHS #5 - SEE PLAN	6.0	101.0	299.0	107.0	502.0	1160.0
3401	AHS #6 - SEE PLAN	-2.0	9.0	21.0	-28.0	26.0	2300.0

NEW ENGLAND DIVISION WATER QUALITY LABORATORY

REPORT PRODUCED ON 08/24/88 14:08:47

GOULD ISLAND, MCALLISTER POINT AND ALLENS HARBOR
SEDIMENT SAMPLES

Negative values are detection limits and indicate that substance was not detected.

SAMPLE	FIELD DESCRIPTION	Total PCBs (ppm)	Petroleum Hydrocarbons (ppm)
3316	GI #1 - SEE PLAN	0.02	100.0
3317	GI #2 - SEE PLAN	0.02	100.0
3318	GI #3 - SEE PLAN	0.04	160.0
3319	GI #4 - SEE PLAN	0.30	300.0
3320	GI #5 - SEE PLAN	0.13	230.0
3321	GI #6 - SEE PLAN	0.04	160.0
3322	MP #1 - SEE PLAN	0.49	480.0
3323	MP #2 - SEE PLAN	0.66	300.0
3324	MP #3 - SEE PLAN	2.03	400.0
3325	MP #4 - SEE PLAN	1.58	330.0
3326	MP #5 - SEE PLAN	0.07	170.0
3327	MP #6 - SEE PLAN	0.86	1100.0
3328	MP #7 - SEE PLAN	0.01	30.0
3396	AHS #1 - SEE PLAN	0.02	50.0
3397	AHS #2 - SEE PLAN	0.03	120.0
3398	AHS #3 - SEE PLAN	1.02	290.0
3399	AHS #4 - SEE PLAN	5.26	1800.0
3400	AHS #5 - SEE PLAN	1.16	2100.0
3401	AHS #6 - SEE PLAN	0.08	150.0

NEW ENGLAND DIVISION WATER QUALITY LABORATORY

REPORT PRODUCED ON 08/24/88 14:09:58

GOULD ISLAND, MCALLISTER POINT AND ALLENS HARBOR
TISSUE SAMPLES

Negative values are detection limits and indicate that substance was not detected.

SAMPLE	FIELD DESCRIPTION	Cd (ppm)	Cr (ppm)	Cu (ppm)	Ni (ppm)	Pb (ppm)	Zn (ppm)
3329	GI #1 - SEE PLAN	-0.4	-2.0	2.0	-6.0	-3.0	19.0
3330	GI #2 - SEE PLAN	-0.4	-2.0	1.9	-6.0	-3.0	25.0
3331	GI #3 - SEE PLAN	-0.4	-2.0	2.4	-0.6	-3.0	25.0
3332	GI #4 - SEE PLAN	-0.4	-2.0	4.6	-7.0	-3.0	21.0
3333	GI #5 - SEE PLAN	-0.4	-2.0	3.3	-6.0	-3.0	20.0
3334	GI #6 - SEE PLAN	-0.4	-2.0	2.0	-7.0	-3.0	21.0
3335	MP #1 - SEE PLAN	-0.4	-2.0	1.4	-6.0	-3.0	18.0
3336	MP #2 - SEE PLAN	-0.4	-2.0	2.8	-6.0	-3.0	23.0
3337	MP #3 - SEE PLAN	-0.4	-2.0	1.6	-6.0	-3.0	23.0
3338	MP #4 - SEE PLAN	-0.4	2.0	1.5	-7.0	-3.0	18.0
3339	MP #5 - SEE PLAN	-0.4	-2.0	-1.4	-7.0	-3.0	16.0
3340	MP #6 - SEE PLAN	-0.4	-2.0	-1.4	-6.0	-3.0	14.0
3341	MP #7 - SEE PLAN	-0.4	-2.0	-1.4	-7.0	-3.0	15.0
3402	AHC #1 - SEE PLAN-SS	-0.4	4.9	6.3	-7.0	-3.0	21.0
3403	AHC #1 - SEE PLAN	-0.4	-2.0	2.2	-6.0	-3.0	12.0
3404	AHC #2 - SEE PLAN	-0.4	-2.0	4.3	-6.0	-3.0	19.0
3405	AHC #3 - SEE PLAN	-0.4	-2.0	5.4	-6.0	-3.0	16.0
3406	AHC #4 - SEE PLAN	-0.4	-2.0	4.9	-7.0	-3.0	17.0
3407	AHC #5 - SEE PLAN	-0.4	-2.0	3.5	-6.0	-3.0	19.0
3408	AHC #6 - SEE PLAN	-0.4	-2.0	3.2	-7.0	-3.0	12.0

NEW ENGLAND DIVISION WATER QUALITY LABORATORY

REPORT PRODUCED ON 08/24/88 14:10:53

GOULD ISLAND, MCALLISTER POINT AND ALLENS HARBOR
TISSUE SAMPLES
Negative values are detection limits and indicate that substance was not detected.

SAMPLE	FIELD DESCRIPTION	Total PCBs (ppm)	Petroleum Hydrocarbons (ppm)
3329	GI #1 - SEE PLAN	0.36	
3330	GI #2 - SEE PLAN	0.20	
3331	GI #3 - SEE PLAN	0.15	
3332	GI #4 - SEE PLAN	0.04	
3333	GI #5 - SEE PLAN	0.07	
3334	GI #6 - SEE PLAN	0.14	
3335	MP #1 - SEE PLAN	0.12	
3336	MP #2 - SEE PLAN	0.05	
3337	MP #3 - SEE PLAN	0.01	
3338	MP #4 - SEE PLAN	0.30	
3339	MP #5 - SEE PLAN	0.03	
3340	MP #6 - SEE PLAN	0.05	
3341	MP #7 - SEE PLAN	0.04	
3402	AHC #1 - SEE PLAN-SS	0.03	
3403	AHC #1 - SEE PLAN	0.04	
3404	AHC #2 - SEE PLAN	0.04	
3405	AHC #3 - SEE PLAN	0.02	
3406	AHC #4 - SEE PLAN	0.02	
3407	AHC #5 - SEE PLAN	0.01	
3408	AHC #6 - SEE PLAN	0.02	

Gould Island, McAllister Point & Allen Harbor

Sediment & Mussel Sampling

January 1988

Prepared By
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Gould Island and McAllister Point, Sediment Sampling

Well defined sedimentary deposits could not be found at Gould Island and McAllister Point. The material which was sampled at these locations is considered beach sand. There appears to be a vigorous scouring of the beach at both sites, due to current, wave and tidal action.

Samples were taken in the inter-tidal zone and sampling began approximately one hour before low tide and seized at the approximate time of low tide to one (1) hour after low tide. Refer to Table 1.

At Gould Island seven wooden stakes were set over a linear distance of four hundred and fifty (450') feet. Stake number one (1) being the southern-most stake and stake number seven (7) being the northern-most stake. Stake number one was placed approximately twenty (20) feet north of the abandoned peer, and subsequent stakes were set sixty five feet (65') apart. Stakes were set in the soil east of the winter tidal berm at the toe of the embankment.

At McAllister Point eight (8) wooden stakes were set over a linear distance of eleven hundred (1100) feet. Stake number one was set one hundred and seventy (170) feet Northwest of the fence post on the edge of the embankment. This fence post is the western-most post of the section of fence which runs perpendicular between the beach and the railroad track. Stake number one was set at the toe of the bank, east of the winter tidal berm. All subsequent stakes were set one hundred and fifty (150) feet apart, at the break of the bank or immediately above the riprap, with the exception of stake number eight which was set two hundred (200) feet north of stake number seven (7). Two concrete blocks used as anchors for the utility pole guide wires were used as reference points for sample number seven.

All samples were taken as close to the waters edge as possible during the low tide period (See table 1). A linear distance from the sample hole to two points (stakes) was measured after the sample was taken. Refer to table 2 for distances from sample points to stakes.

The original intent of this sampling survey was to sample a core of sediment from a depth of one (1) foot. However, due to the natural and man made conditions of this site any attempt to obtain a core sample without the facility of an elaborate hydraulic or electric coring device is impractical.

Sample holes were dug with a steel garden shovel and a crow bar. A sample depth of twelve inches was not attainable because of the presence of large stones, boulders, debris from the dump site and water infiltration. All sample material was taken at a depth of four (4) inches to eight (8) inches.

After the sample hole was dug a stainless steel spoon was used to clean out the hole. The inside of the hole was swiped with the spoon from a depth of 4"-8" to obtain the sample. The samples were placed in wide mouth amber glass jars, cleaned to EPA protocols, with teflon lined closures. The jars were appropriately labeled, placed in coolers and iced.

All tools and sampling devices were appropriately washed with hexane after the sampling of each hole. The hexane was collected in a tray, poured off in a teflon bottle and returned to the Water Quality Laboratory for proper disposal.

Allen Harbor, Sediment Sampling

An established sedimentary horizon exists in Allen Harbor in the tidal flats and at the toe of the landfill below mean low water.

A coring device as shown in figure 3 was used to obtain sediment samples, at the required depth of 9"-15", from all six (6) sample locations in Allen Harbor.

Sampling began approximately two (2) hours before low tide and was completed one (1) hour after low tide on March 2, 1988, reference Table 4.

Sample numbers 2 through 6 were taken from a boat and, sample area number 1 was accessed by foot. All samples remained undisturbed in the original tube used to push the core. The tube was immediately cut, capped, and placed in a cooler, on ice. Reference Figure No. 4 for sample site locations.

Allen Harbor, Clam Sampling

Six clam samples were taken from Allen harbor on March 3, 1988. Five of the samples consist of hard shell clams which were raked from the harbor bottom in the areas of sample points 2-6. Soft shell and hard shell clams were taken from the area of sample #1, which is an exposed tidal flat during periods of low tide.

The clams were kept alive in containers filled with seawater from Allen Harbor and transported to the Water Quality Laboratory. Reference Figure No. 4 for sample site locations.

Gould Island and McAllister Point, Mussel Sampling

Mussels were collected by hand within a fifteen (15) to twenty (20) foot radius of the sample hole. All blue mussels collected were approximately 2" in length. Approximately 25-30 mussels were collected from each sample hole area. They were placed (live) in zip lock plastic bags, sealed, placed in coolers and kept on ice until they were returned to the laboratory and froze.

Chain of Custody

A chain of custody record was kept for all samples which were collected on January 19th and 20th. All samples were under the custody of a sample crew member and kept in a locked utility van at all times. Upon arrival at the Water Quality Laboratory, Hubbardston, MA, the samples were immediately placed and locked in the laboratory's walk in cooler and chest freezer. The samples were relinquished to the laboratory's sample custodian on the morning of January 21, 1988. Chain of custody record is enclosed with this report (Appendix A).

Table No. 1
Gould Island Sample Site Locations and Time of Sampling*

Sample Site No.	Stake Numbers	Distance from stake to hole	Compass Direction of sample from stakes	Time of sample
1	1	57'	W N/W	1245
	2	65'	S/W	
2	1	78'	N/W	1256
	2	48'	W	
3	2	69'	N/W	1304
	3	39'	W S/W	
4	3	73'	N/W	1313
	4	26'	W	
5	4	71'	N/W	1324
	5	19'	W S/W	
6	6	50'	W N/W	1357
	7	24'	W S/W	

* Low Tide, January 19th, 1988, 1332 hrs
Tide tables taken from, Tide Tables 1988 East Coast of North America, U.S. Department of Commerce, NOAA

Table No. 2
McAllister Point Sample Site Locations and Time of Sampling*

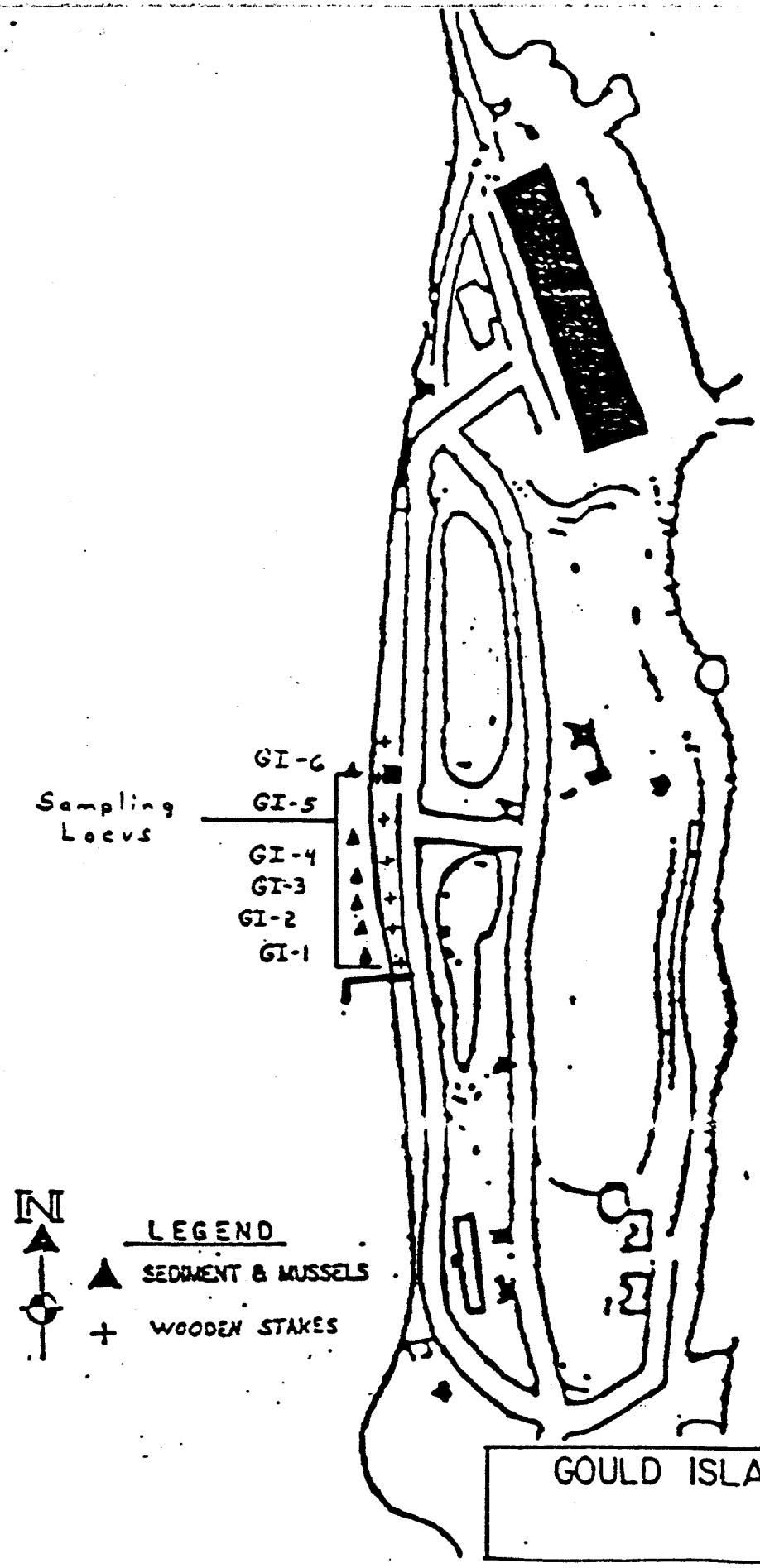
Sample Site No.	Stake Numbers	Distance from stake to hole	Compass Direction of sample from stakes	Time of sample
1	1	67'	W	1530
	Fence Post	207'	N/W	
2	1	150'	N/W	1500
	2	47'	N/W	
3	3	142'	N/W	1440
	4	38'	W	
4	4	122'	N/W	1420
	5	46'	W	
5	5	126'	N/W	1400
	6	49'	S/W	
6	6	146'	N/W	1340
	7	26'	W	
7	Anchors for guide wires	57'	W N/W	1317
		[illegible]	N/W	

* Low tide, January 20th, 1988, 1420 hrs

Table No. 3
Weather Conditions During Sampling Activity

Weather conditions on the sampling dates were as follows:

	Clear	Overcast	Rain	Temp.	Wind Velocity
January 19th	*	-	-	20-30°F	10-15 mph
January 20th	-	*	Heavy	34-38°F	5-10 mph
March 2nd	*	-	-	45°F	$\leq$ 5 mph
March 3rd	-	*	-	45-50°F	0



GOULD ISLAND DISPOSAL AREA

NOT TO SCALE

JAN. 22, 1988

FIG. NO. 1

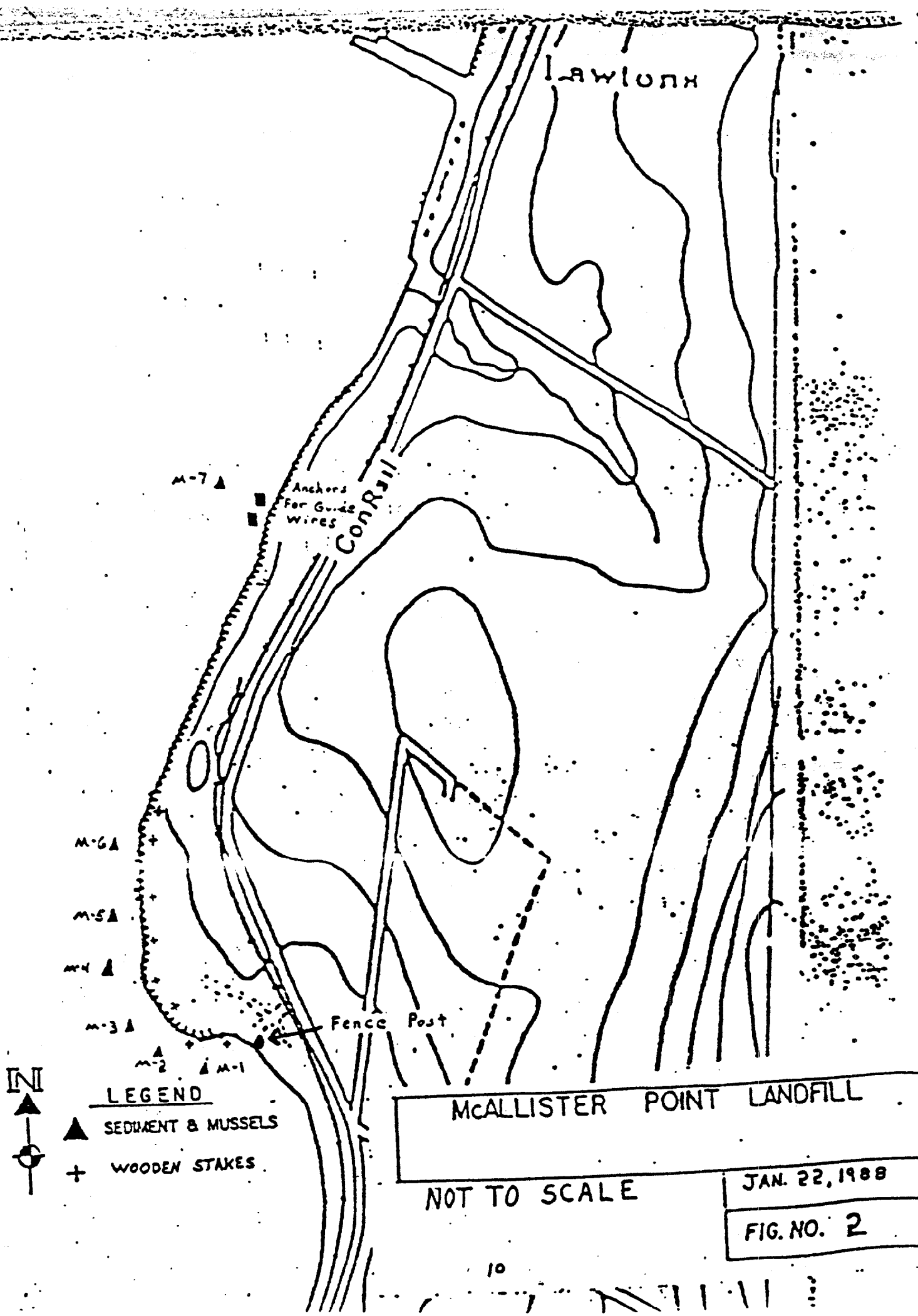
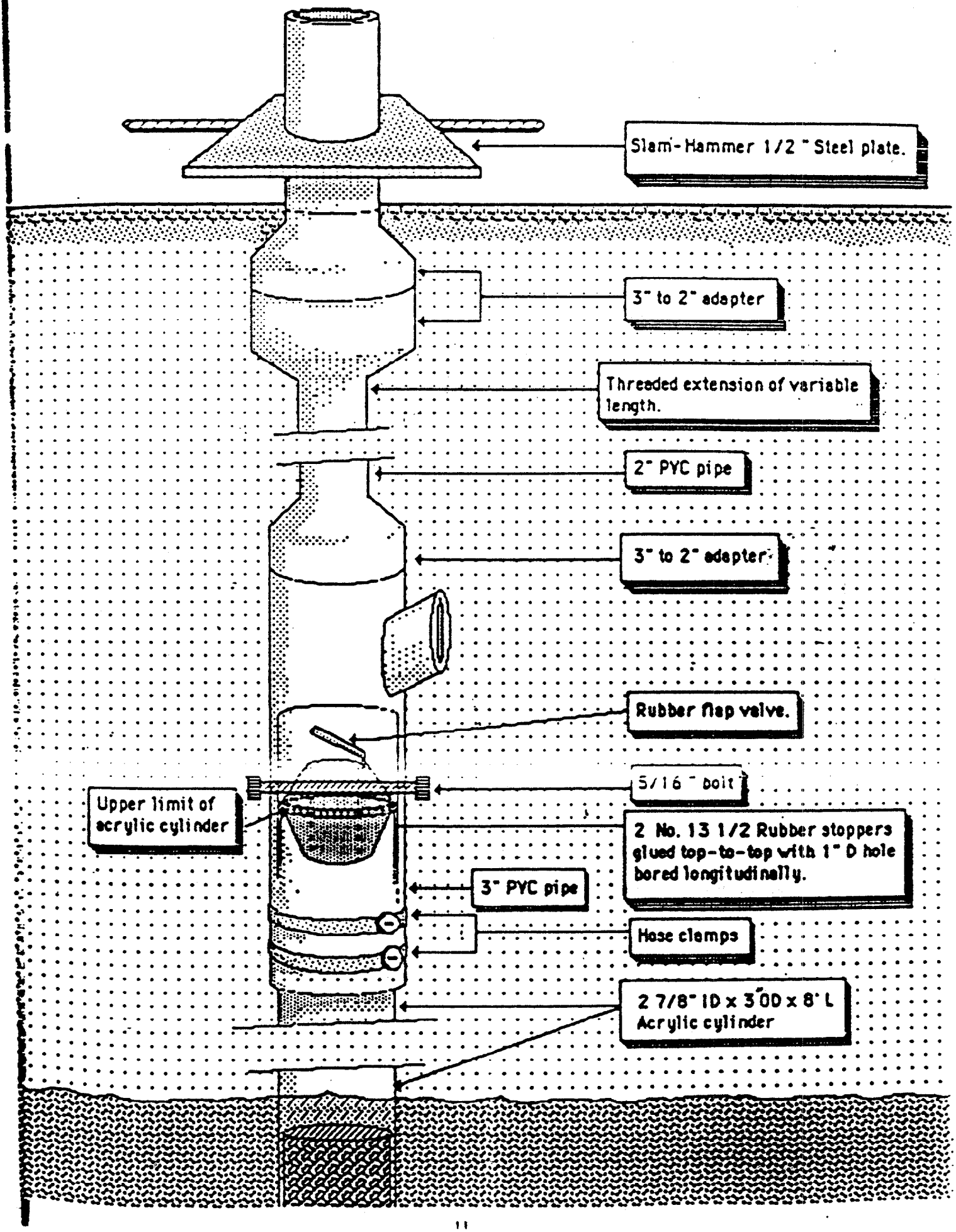
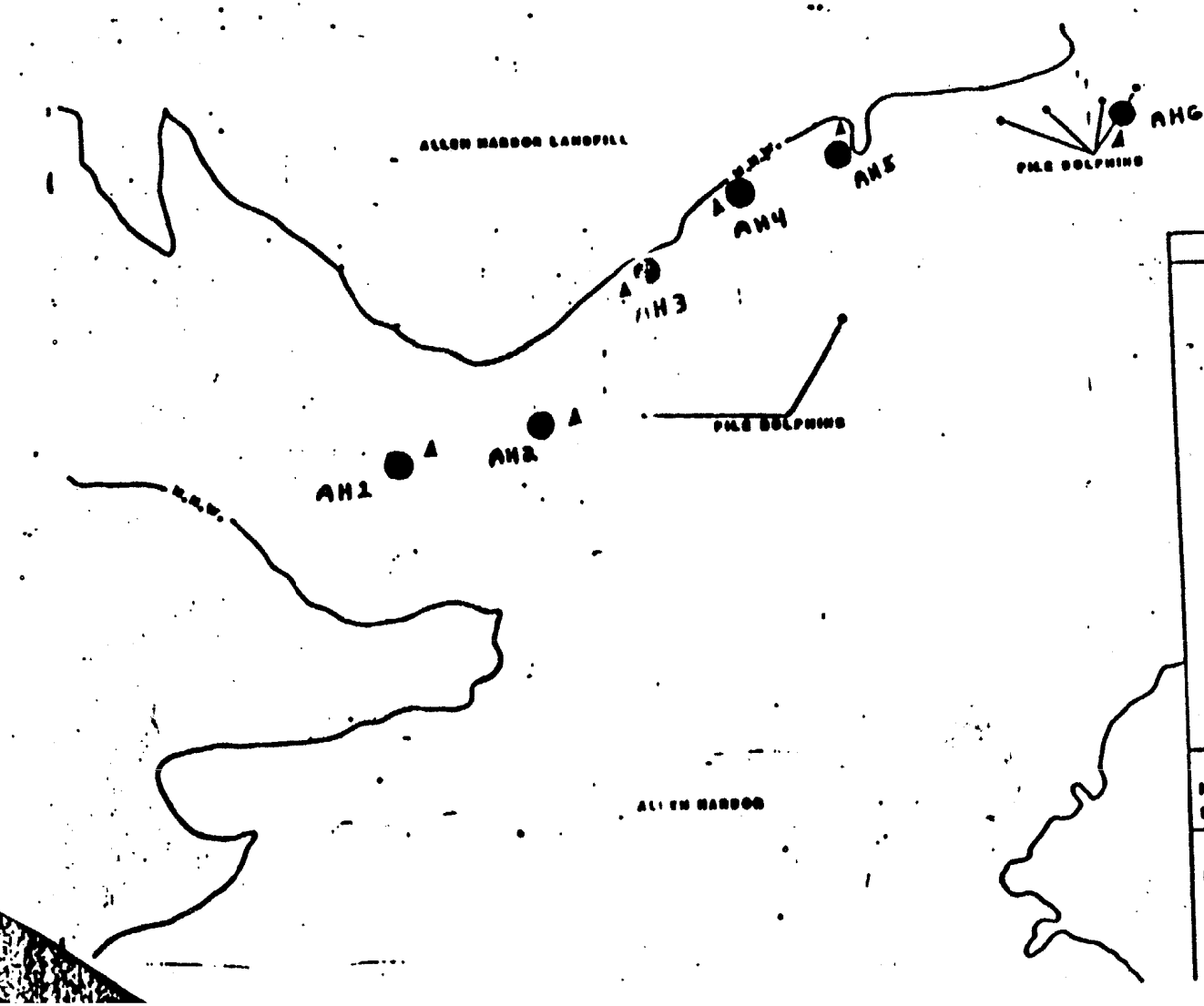

Lawton
M-7
Anchors For Guide Wires
ConRail
M-6
M-5
M-4
M-3
M-2
M-1
Fence Post
N
LEGEND
SEDIMENT & MUSSELS
WOODEN STAKES
McALLISTER POINT LANDFILL
NOT TO SCALE
JAN. 22, 1988
FIG. NO. 2

FIGURE 3


Slam-Hammer 1/2 " Steel plate.
3" to 2" adapter
Threaded extension of variable length.
2" PVC pipe
3" to 2" adapter
Rubber flap valve.
5/16 " bolt
Upper limit of acrylic cylinder
2 No. 13 1/2 Rubber stoppers glued top-to-top with 1" D hole bored longitudinally.
3" PVC pipe
Hose clamps
2 7/8" ID x 3"OD x 8' L Acrylic cylinder



LEGEND

▲ SEDIMENT SAMPLE LOCATION

● CLAM SAMPLE LOCATION

NAVAL CONSTRUCTION BATTALION CENTER
DAVISVILLE, RHODE ISLAND

FIGURE 4
SAMPLING LOCATION PLAN
SITE - ALLEN HARBOR LANDFILL

CHAIN OF CUSTODY RECORD

PROJ. NO.

PROJECT NAME: Allen Harbor

SAMPLERS (Signature): Paul Spano / Nancy L. Amsden

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	Metals: Cd, Cr, Cu, Ni, Pb, Zn	PCBs	Total Petroleum Hydrocarbons				REMARKS
AHS #1	3-2-88				Refer to Allen Harbor Sample location Plan	1	✓	✓	✓				1 Tube of sediment
AHS #2	3-2-88				" "	1	✓	✓	✓				" "
AHS #3	3-2-88				" "	1	✓	✓	✓				" "
AHS #4	3-2-88				" "	1	✓	✓	✓				" "
AHS #5	3-2-88				" "	1	✓	✓	✓				" "
AHS #6	3-2-88				" "	1	✓	✓	✓				" "
AHC #1	3-3-88				" "	3	✓	✓	✓				1 doz. soft shell clams "
AHC #1	3-3-88				" "	3	✓	✓	✓				1 doz. Quahogs
AHC #2	3-3-88				" "	4	✓	✓	✓				1 doz. quahogs
AHC #3	3-3-88				" "	2	✓	✓	✓				" "
AHC #4	3-3-88				" "	2	✓	✓	✓				" "
AHC #5	3-3-88				" "	4	✓	✓	✓				" "
AHC #6	3-3-88				" "	3	✓	✓	✓				" "

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Paul J. Spano	3-4-88 0800	Patricia Grande			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

U.S. ARMY CORPS OF ENGINEERS

Appendix A

CHAIN OF CUSTODY RECORD

PROJ. NO.

PROJECT NAME: Goulds Is. + McAllister Point R.I.

SAMPLERS: (Signature) Paul A. Spano, Nancy Y. Amida

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	Metals: Cd, Cr, Cu, Ni, Pb, Zn	PCBs	Total Petroleum Hydrocarbons				REMARKS
GI1	01-19-88	1245		✓	Newport Goulds I.S. #1 see sample plan	2	✓	✓	✓				1 bottle of soil, 1 bag of mussels
GI2		1256		✓	" " #2	2	✓	✓	✓				1 bottle of soil, 1 bag of mussels
GI3		1304		✓	" " #3	2	✓	✓	✓				" "
GI4		1313		✓	" " #4	2	✓	✓	✓				" "
GI5		1324		✓	" " #5	2	✓	✓	✓				" "
GI6		1337		✓	" " #6	2	✓	✓	✓				" "
M-1	01-20-88	1530		✓	McAllister Point #1	2	✓	✓	✓				1 bottle of soil, 1 bag of Mussels
M-2		1500		✓	" " #2	2	✓	✓	✓				" "
M-3		1440		✓	" " 3	2	✓	✓	✓				" "
M-4		1420		✓	" " 4	2	✓	✓	✓				" "
M-5		1400		✓	" " 5	2	✓	✓	✓				" "
M-6		1340		✓	" " 6	2	✓	✓	✓				" "
M-7		1317		✓	" " 7	2	✓	✓	✓				" "

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Paul A. Spano	01/21/88 0800	RW Gamache			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

NEW ENGLAND DIVISION WATER QUALITY LABORATORY

REPORT PRODUCED ON 08/24/88 14:07:47

GOULD ISLAND, MCALLISTER POINT AND ALLENS HARBOR
SEDIMENT SAMPLES

Negative values are detection limits and indicate that substance was not detected.

SAMPLE	FIELD DESCRIPTION	Cd (ppm)	Cr (ppm)	Cu (ppm)	Ni (ppm)	Pb (ppm)	Zn (ppm)
3316	GI #1 - SEE PLAN	-2.0	18.0	151.0	-29.0	168.0	126.0
3317	GI #2 - SEE PLAN	3.0	16.0	308.0	-29.0	335.0	253.0
3318	GI #3 - SEE PLAN	6.0	35.0	738.0	31.0	2080.0	251.0
3319	GI #4 - SEE PLAN	3.0	32.0	2270.0	-29.0	1520.0	285.0
3320	GI #5 - SEE PLAN	15.0	34.0	7400.0	37.0	2270.0	515.0
3321	GI #6 - SEE PLAN	-2.0	13.0	160.0	-29.0	126.0	73.0
3322	MP #1 - SEE PLAN	3.0	57.0	1370.0	1340.0	3130.0	2440.0
3323	MP #2 - SEE PLAN	-2.0	69.0	556.0	90.0	814.0	814.0
3324	MP #3 - SEE PLAN	11.0	98.0	25000.0	225.0	4410.0	2410.0
3325	MP #4 - SEE PLAN	12.0	94.0	1220.0	154.0	2290.0	1790.0
3326	MP #5 - SEE PLAN	7.0	2190.0	2810.0	1310.0	587.0	587.0
3327	MP #6 - SEE PLAN	8.0	86.0	3981.0	440.0	3680.0	1760.0
3328	MP #7 - SEE PLAN	-2.0	11.0	16.0	33.0	16.0	67.0
3396	AHS #1 - SEE PLAN	-2.0	10.0	14.0	-30.0	-15.0	39.0
3397	AHS #2 - SEE PLAN	-2.0	10.0	19.0	-30.0	28.0	46.0
3398	AHS #3 - SEE PLAN	3.0	27.0	233.0	42.0	249.0	916.0
3399	AHS #4 - SEE PLAN	5.0	58.0	431.0	106.0	452.0	1290.0
3400	AHS #5 - SEE PLAN	6.0	101.0	299.0	107.0	502.0	1160.0
3401	AHS #6 - SEE PLAN	-2.0	9.0	21.0	-28.0	26.0	2300.0

NEW ENGLAND DIVISION WATER QUALITY LABORATORY

REPORT PRODUCED ON 08/24/88 14:08:47

GOULD ISLAND, MCALLISTER POINT AND ALLENS HARBOR
SEDIMENT SAMPLES

Negative values are detection limits and indicate that substance was not detected.

SAMPLE	FIELD DESCRIPTION	Total PCBs (ppm)	Petroleum Hydrocarbons (ppm)
3316	GI #1 - SEE PLAN	0.02	100.0
3317	GI #2 - SEE PLAN	0.02	100.0
3318	GI #3 - SEE PLAN	0.04	160.0
3319	GI #4 - SEE PLAN	0.30	300.0
3320	GI #5 - SEE PLAN	0.13	230.0
3321	GI #6 - SEE PLAN	0.04	160.0
3322	MP #1 - SEE PLAN	0.49	480.0
3323	MP #2 - SEE PLAN	0.66	300.0
3324	MP #3 - SEE PLAN	2.03	400.0
3325	MP #4 - SEE PLAN	1.58	330.0
3326	MP #5 - SEE PLAN	0.07	170.0
3327	MP #6 - SEE PLAN	0.86	1100.0
3328	MP #7 - SEE PLAN	0.01	30.0
3396	AHS #1 - SEE PLAN	0.02	50.0
3397	AHS #2 - SEE PLAN	0.03	120.0
3398	AHS #3 - SEE PLAN	1.02	290.0
3399	AHS #4 - SEE PLAN	5.26	1800.0
3400	AHS #5 - SEE PLAN	1.16	2100.0
3401	AHS #6 - SEE PLAN	0.08	150.0

NEW ENGLAND DIVISION WATER QUALITY LABORATORY

REPORT PRODUCED ON 08/24/88 14:09:58

GOULD ISLAND, MCALLISTER POINT AND ALLENS HARBOR
TISSUE SAMPLES
Negative values are detection limits and indicate that substance was not detected.

SAMPLE	FIELD DESCRIPTION	Cd (ppm)	Cr (ppm)	Cu (ppm)	Ni (ppm)	Pb (ppm)	Zn (ppm)
3329	GI #1 - SEE PLAN	-0.4	-2.0	2.0	-6.0	-3.0	19.0
3330	GI #2 - SEE PLAN	-0.4	-2.0	1.9	-6.0	-3.0	25.0
3331	GI #3 - SEE PLAN	-0.4	-2.0	2.4	-0.6	-3.0	25.0
3332	GI #4 - SEE PLAN	-0.4	-2.0	4.6	-7.0	-3.0	21.0
3333	GI #5 - SEE PLAN	-0.4	-2.0	3.3	-6.0	-3.0	20.0
3334	GI #6 - SEE PLAN	-0.4	-2.0	2.0	-7.0	-3.0	21.0
3335	MP #1 - SEE PLAN	-0.4	-2.0	1.4	-6.0	-3.0	18.0
3336	MP #2 - SEE PLAN	-0.4	-2.0	2.8	-6.0	-3.0	23.0
3337	MP #3 - SEE PLAN	-0.4	-2.0	1.6	-6.0	-3.0	23.0
3338	MP #4 - SEE PLAN	-0.4	2.0	1.5	-7.0	-3.0	18.0
3339	MP #5 - SEE PLAN	-0.4	-2.0	-1.4	-7.0	-3.0	16.0
3340	MP #6 - SEE PLAN	-0.4	-2.0	-1.4	-6.0	-3.0	14.0
3341	MP #7 - SEE PLAN	-0.4	-2.0	-1.4	-7.0	-3.0	15.0
3402	AHC #1 - SEE PLAN-SS	-0.4	4.9	6.3	-7.0	-3.0	21.0
3403	AHC #1 - SEE PLAN	-0.4	-2.0	2.2	-6.0	-3.0	12.0
3404	AHC #2 - SEE PLAN	-0.4	-2.0	4.3	-6.0	-3.0	19.0
3405	AHC #3 - SEE PLAN	-0.4	-2.0	5.4	-6.0	-3.0	16.0
3406	AHC #4 - SEE PLAN	-0.4	-2.0	4.9	-7.0	-3.0	17.0
3407	AHC #5 - SEE PLAN	-0.4	-2.0	3.5	-6.0	-3.0	19.0
3408	AHC #6 - SEE PLAN	-0.4	-2.0	3.2	-7.0	-3.0	12.0

NEW ENGLAND DIVISION WATER QUALITY LABORATORY

REPORT PRODUCED ON 08/24/88 14:10:53

GOULD ISLAND, MCALLISTER POINT AND ALLENS HARBOR
TISSUE SAMPLES
Negative values are detection limits and indicate that substance was not detected.

SAMPLE	FIELD DESCRIPTION	Total PCBs (ppm)	Petroleum Hydrocarbons (ppm)
3329	GI #1 - SEE PLAN	0.36	
3330	GI #2 - SEE PLAN	0.20	
3331	GI #3 - SEE PLAN	0.15	
3332	GI #4 - SEE PLAN	0.04	
3333	GI #5 - SEE PLAN	0.07	
3334	GI #6 - SEE PLAN	0.14	
3335	MP #1 - SEE PLAN	0.12	
3336	MP #2 - SEE PLAN	0.05	
3337	MP #3 - SEE PLAN	0.01	
3338	MP #4 - SEE PLAN	0.30	
3339	MP #5 - SEE PLAN	0.03	
3340	MP #6 - SEE PLAN	0.05	
3341	MP #7 - SEE PLAN	0.04	
3402	AHC #1 - SEE PLAN-SS	0.03	
3403	AHC #1 - SEE PLAN	0.04	
3404	AHC #2 - SEE PLAN	0.04	
3405	AHC #3 - SEE PLAN	0.02	
3406	AHC #4 - SEE PLAN	0.02	
3407	AHC #5 - SEE PLAN	0.01	
3408	AHC #6 - SEE PLAN	0.02	