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A Halliburton Company

PROJECT FOR PERFORMANCE OF REMEDIAL RESPONSE ACTIVITIES AT UNCONTROLLED HAZARDOUS SUBSTANCE FACILITIES—ZONE 1

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FIELD INVESTIGATION
OF
ACUSHNET COMPANY
NEW BEDFORD, MASSACHUSETTS

PREPARED UNDER

TECHNICAL DIRECTIVE DOCUMENT NO. F1-8302-01
NUS JOB NO. 3200
CONTRACT NO. 68-01-6699

FOR THE
REGION I
U.S. ENVIRONMENTAL PROTECTION AGENCY
SITE RESPONSE SECTION

May 23, 1983

NUS CORPORATION
SUPERFUND DIVISION

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SUBMITTED BY

Gregory A. Roscoe

GREGORY A. ROSCOE
TOXICOLOGIST

APPROVED BY

Paul F. Clay

PAUL F. CLAY
REGION I FIT MANAGER

Anthony DeMarco Jr

ANTHONY J. DEMARCO
QUALITY ASSURANCE OFFICER

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EXECUTIVE SUMMARY

NUS/FIT conducted sampling of surface soil, river sediments, and surface water at Acushnet Company, New Bedford, Massachusetts. The findings are summarized as follows:

- Analysis of soil and sediment samples for PCBs has revealed the presence of Aroclors 1242 and 1254.
- The most highly contaminated area investigated, appeared to be a partially impounded area containing Acushnet River sediments. This assessment was made based upon the results of PCB and metals analysis.
- There is lesser contamination of the property directly adjacent to the Acushnet Company manufacturing plant. Contaminants identified include lead and Aroclor 1254.

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1.0 INTRODUCTION

1.1 Summary Of FIT Involvement

NUS/FIT was tasked in February, 1983 to conduct sampling at three locations bordering the Acushnet River in New Bedford, Massachusetts. In addition, NUS/FIT was tasked to map industrial properties bordering New Bedford Harbor. In partial fulfillment of Technical Directive Document (TDD) 8302-01 (Appendix C) issued by EPA, NUS is submitting a report which summarizes sampling activities at the Acushnet Company, New Bedford, Massachusetts.

1.2 Scope Of Work

The purpose of this investigation was to conduct sampling and analysis of surface samples at the Acushnet Company for polychlorinated biphenyls (PCBs) and metals. Sampling was to take place around the Acushnet Company manufacturing plant and from intertidal sediments bordering the Acushnet River. A water sample was to be collected if any pipes were found discharging effluent into the river.

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2.0 ACUSHNET COMPANY INVESTIGATION

On March 10, 1983, NUS/FIT conducted sampling activities at Acushnet Company, Rubber Division, New Bedford, Massachusetts (see Figure 1). On the day of sampling, ambient air temperature was 35° to 45° F with intermittent precipitation. Five grab soil samples, three intertidal samples, and one water sample were obtained (see Figure 2). Soil samples were taken from the top six inches of top soil with a stainless steel trowel and placed in glass 8 oz. wide mouth containers. The trowel was decontaminated between each sample with an Alcanox wash, water rinse, methanol rinse, water rinse. The water sample for organics analysis was collected in two 1/2 gallon amber glass containers. The water sample for heavy metals analysis was collected in two 1-pint polyethylene containers.

2.1 Soil Samples

The surficial soil samples were obtained from five locations around the Acushnet Co., manufacturing plant (see Figure 2). Three of these samples were collected from an area between the property fence and the south parking lot. These samples were designated A_2, A_3, and A_4. The remaining soil samples (A1, A6) were collected adjacent to the Acushnet manufacturing plant along the north wall at the east corner and along the east wall respectively. Sample C_4 represents a field blank taken from Bedford, Massachusetts.

2.2 Intertidal Samples

Three intertidal samples were collected from the Acushnet Co. vicinity (see Figure 2). Sample A7 represented a surficial sample from the shoreline adjacent to the manufacturing plant. This sample was collected from the harbor-shore interface. Samples A8 and A9 represent intertidal sediment samples collected from an area which is enclosed on three sides by the shoreline, a breakwater, and an outcropping of land which extends into the Acushnet River. This partially enclosed area contained an abundance of silty organic harbor sediments, the consistency of which was in contrast to the gravel-like nature of

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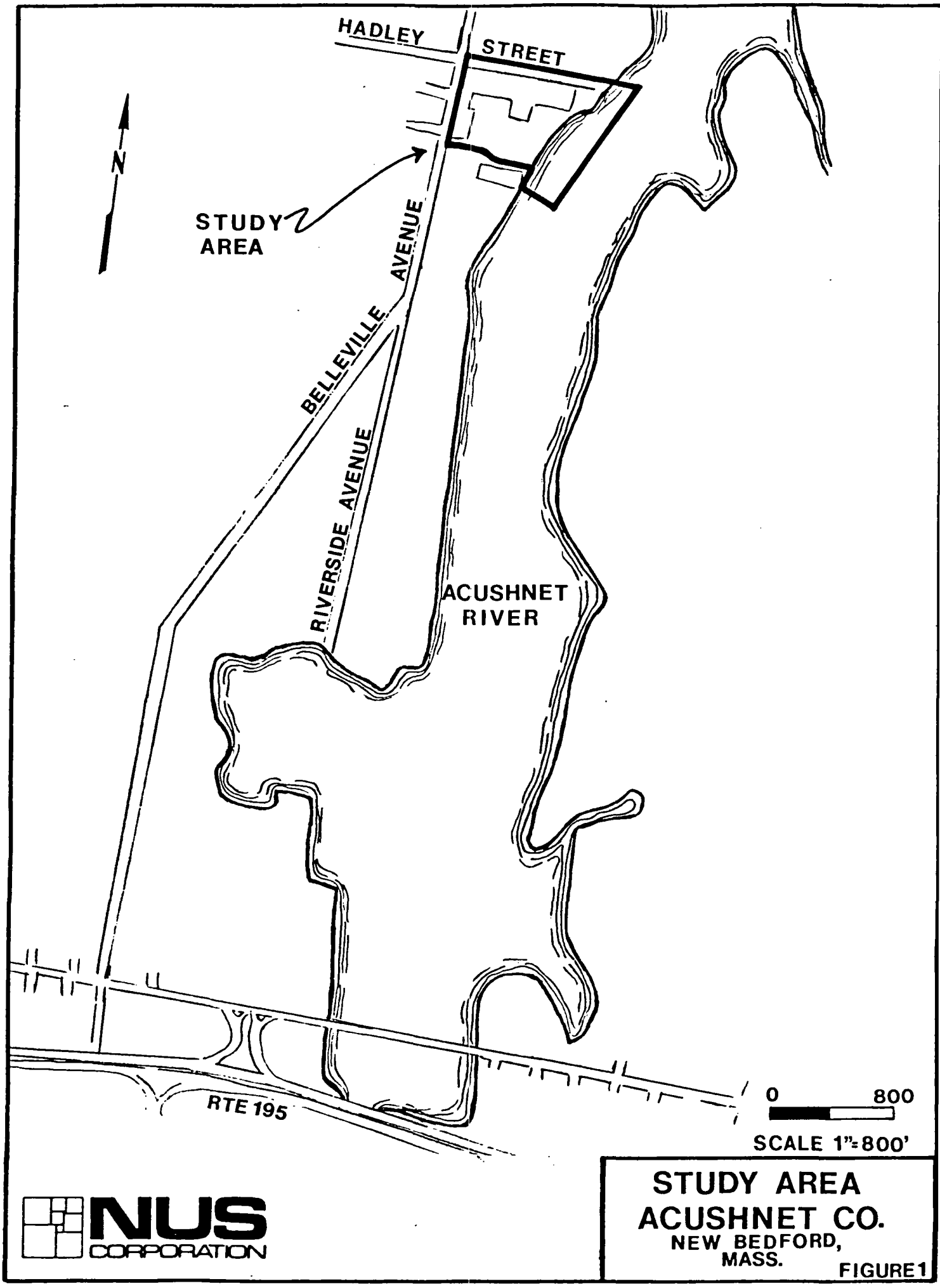
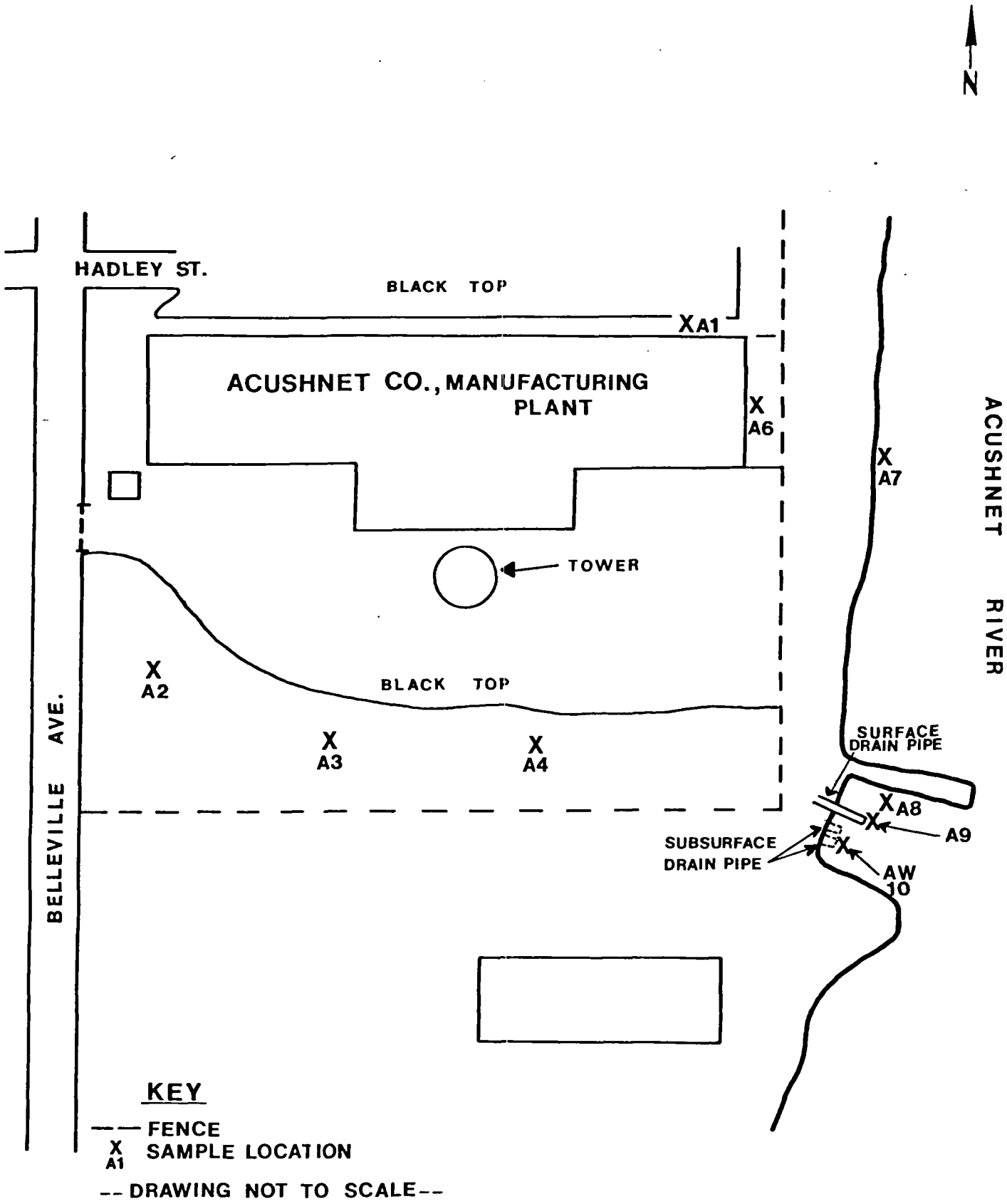

HADLEY
STREET
N
STUDY
AREA
BELLEVILLE AVENUE
RIVERSIDE AVENUE
ACUSHNET
RIVER
RTE 195
0
800
SCALE 1"=800'
NUS
CORPORATION
STUDY AREA
ACUSHNET CO.
NEW BEDFORD,
MASS.
FIGURE 1



SAMPLING LOCATIONS
ACUSHNET COMPANY

FIGURE 2

NUS CORPORATION

the shoreline to the immediate north of this area. Sample A8 was collected approximatley 20' off-shore and A9 was collected opposite the end of a surface drain-pipe. Examination of the drain-pipe revealed that the interior-bottom of the pipe had completely corroded. Therefore, current drainage was now taking place posterior to the physical opening of the pipe. The sediment sample (A9) was collected directly opposite the outer-most portion of the pipe (not where current drainage was observed).

2.3 Water Sample

The area adjacent to the surface drainage pipe (see Figure 2) contained two pipes located below the surface of the water. Turbulence was observed at the outlet of the southernmost submerged pipe. The water sample, AW10, was collected approximately 1 foot below the water surface at the approximate outlet of this pipe. A second submerged pipe which exhibited no visual evidence of discharge was not sampled as the EPA Project Manager requested samples only be taken from pipes which were actively discharging effluent.

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3.0 RESULTS

3.1 PCB Analyses

The results of PCB analysis on the soil and water samples are presented in Table 1. The results are presented both on a wet and dry weight basis for comparison of in situ levels and comparison of dry-weight levels. Also detection limits are reported on a wet-weight basis. The analyses suggest that Aroclors 1242 and 1254 were the predominant mixtures present at this site. The highest total PCB levels were found in New Bedford Harbor sediments taken from the area which is partially enclosed and contains the drain-pipes (Figure 2). Of the two harbor sediment samples taken at this location, the highest PCB levels were found in the sample taken opposite the end of the surface drain-pipe (sample A9). Aroclor 1242 was presnt at levels twice that of Aroclor 1254 at this location. The combined PCB concentration at sample location A9 on a dry weight basis was 1220 ppm. Sample A8, collected slightly north-east of A9, also exhibited approximately the same ratio of Aroclor 1242 to 1254 (2:1), and contained a total PCB concentration of 598 ppm (dry weight). The water sample had non-detectable levels of PCB (1 mcg/L detection limit). A sample taken from the shore line north of the partially impounded area exhibited levels of Aroclor 1254 which could not be accurately quantified. This sample also differed physically from the intertidal samples A8 and A9, apparently containing much less organic material than A8 and A9 and having a sand-like consistency (see Table 2).

The soil samples taken from around the Acushnet Co., manufacturing plant showed detectable levels of Aroclor 1254 only. The PCB levels associated with sampling locations directly adjacent to the plant (sample locations A6 and A1) were higher than those located away from the plant (sediment samples excluded). These locations exhibited Aroclor 1254 levels of 30 and 19 ppm, dry weight. Three soil samples taken from a grassy area on the south side of the plant exhibited detectable levels of Aroclor 1254; however, two of these samples were at levels which could not be accurately quantified, the third sample was reported to contain 3.0 ppm Aroclor 1254 (dry weight).

TABLE 1
SUMMARY OF PCB ANALYSES

STA	LAB ID	%M	Concentration PCB, ppm WET Aroclor 1242	WET Aroclor 1254	DRY Aroclor 1242	DRY Aroclor 1254
A1	A 1401	17.9	ND[1]	16	ND	19
A2	A 1395	10.4	ND[1]	0.4[a]	ND	0.4[a]
A3	A 1398	17.1	ND[1]	0.3[a]	ND	0.4[a]
A4	A 1394	22.3	ND[1]	2.3	ND	3.0
A6	A 1400	17.6	ND[2]	25	ND	30
A7	A 1399	16.2	ND[2]	11[a]	ND	13.2[a]
A8	A 1397	63.2	160	60	435	163
A9	A 1396	50.0	410	200	820	400
AW10*	A 1393	---	ND[3]	ND[3]	---	---
C4	A 1405	10.2	ND[1]	ND[1]	ND	ND

*AW10 - surface water sample
STA - station number

LAB ID - contract lab sample identification number of detection
%M - moisture content of sample, percent

WET - concentration, wet weight basis
DRY - concentration, dry weight basis

ND - not detectable
1 at 0.2 ppm limit of detection
2 at 5.0 ppm limit

3 at 1 mcg/L level of detection

a - detected below GC/MS contractual detection limit

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TABLE 2. SAMPLE DESCRIPTION

STA	DESCRIPTION
A1	brown fine to coarse SAND, trace fine cobble, trace organic material
A2	brown fine to coarse SAND, trace silt
A3	brown fine SAND, trace fine gravel
A4	black fine SAND
A6	brown fine to medium SAND, some silt, trace coarse sand, organic material
A7	brown fine to medium SAND
A8	black, wet, PEAT
A9	black, wet PEAT and silt
AW10	water sample
C4	soil blank, Bedford, Massachusetts

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3.2 Metals Analyses

The results of the metals analysis are presented in Table 3 and are on a wet weight basis.

From Table 3 it can be seen that the lead levels in the Acushnet Co. samples appear considerably elevated over the Bedford, Massachusetts soil blanks. The highest lead levels were found in the New Bedford Harbor sediment samples taken from the partially impounded area containing the drain-pipes (Figure 2). These locations (A8 and A9) exhibited lead levels of 830 and 630 ppm respectively (wet-weight). Chromium levels also appeared elevated at these two locations being 313 and 108 ppm (wet weight) respectively. See Table 3 for reported levels of other metals.

The water sample exhibited 75 ppb lead and 700 ppb boron. The water sample was collected at the outlet of an actively discharging submerged drain pipe.

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TABLE 3. SUMMARY OF METALS ANALYSES

	Concentration * at Location									
Metal	A1	A2	A3	A4	A6	A7	A8	A9	AW10+	C4
Al	2420	7310	2200	3050	2900	54.6	4460	4580	200+	4310
Ba	15	15	10	115	65	0.5	65	240	ND	10
Be	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
B	ND	ND	ND	ND	ND	0.1	10	10	700+	ND
Cr	4.5	23	3	7.5	14	0.18	313	108	ND	5.5
Co	ND	5	ND	ND	ND	ND	2.5	ND	ND	ND
Cu	30	10	7.5	42.5	45	1.65	568	433	ND	5
Fe	3850	14600	2690	4370	4380	5920	9290	10,400	500+	4080
Mn	101	307	57.7	61.5	103	4.0	63.7	67.5	30+	42
Ni	8	14	10	6	12	0.160	46.0	26	ND	4
Ag	ND	ND	ND	ND	ND	ND	1.0	2.5	ND	ND
V	40	30	20	20	30	0.2	70	50	ND	ND
Zn	42.5	47	12	101	87.5	1.77	1280	801	70	8.5
Sb	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
As	1.5	4.5	1	3.5	1.5	7	4	5	ND	4.5
Cd	0.2	0.05	0.25	0.35	0.4	0.1	28	4	ND	ND
Pb	144	14.5	83	168	278	212	830	630	75a+	4.8a
Hg	ND	0.1	ND	ND	ND	ND	0.4	0.3	ND	ND
Se	ND	ND	ND	0.6	ND	ND	ND	ND	ND	ND
Tl	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sn	3	ND	1	ND	3	1	8	1	b	ND

* values in ppm, on a wet weight basis
a analyzed by standard additions method, however not EPA protocol
b interference
ND not detected
\+ values in mcg/L (ppb)

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4.0 SAMPLE HANDLING

4.1 Sample Splits

On March 8, 1983, NUS/FIT contacted the Acushnet Company by phone to obtain permission for site access. At this time, NUS also offered splits of all samples which would be taken. E. Labonte of Acushnet Company refused the offer of sample splits at this time. On March 10, 1983, the day of the sampling activity, NUS again made an offer of sample splits which was also declined by E. Labonte of Acushnet Company.

4.2 Chain Of Custody

Chain of custody was maintained and documented on an EPA CHAIN OF CUSTODY RECORD. Collection of the samples was documented on CHAIN OF CUSTODY RECORD No. 0185. The samples were relinquished by Gregory Roscoe of NUS/FIT on March 14, 1983 to Gerard Porter° NUS/FIT. At this time, the samples for organics analysis were transferred to CHAIN OF CUSTODY RECORD No. 0186 and the samples for metals analysis were transferred to CHAIN OF CUSTODY RECORD No. 0187. Samples were shipped on March 14, 1983, and received by the respective analyzing laboratories on March 15, 1983. The chain of custody documents are maintained in the NUS/FIT project file.

4.3 Storage Conditions

Samples were maintained on ice from the day of sampling to the day of shipment to the contract laboratories. The one pint polyethylene bottles with water samples for metals analysis were preserved with approximately 0.7 ml concentrated HNO_3 each. On the day of sample shipment to the contract labs, the water sample for PCB analysis was placed on ice in the shipment cooler. According to the sample log-in sheet for West Coast Technical Service, Inc., all samples were received cold and intact. The samples for PCB analysis were extracted either on March 16 or March 21, 1983, and samples for metals analysis were analyzed April 11, 1983.

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4.4 Analysis And Quality Control

The samples were analyzed under the EPA's National Contract Laboratory Program, Case Number 1569. The PCB analyses were conducted by West Coast Technical Service, Inc. of Cerritos, California. The metals analyses were conducted by Versar Inc. of Springfield, Virginia.

Mr. Arthur Clark of the EPA New England Regional laboratory (NERL) in Lexington, Massachusetts conducted a preliminary review of the analytical results for this investigation. Copies of the analysis data sheets can be found in Appendix A and B. According to A. Clark, the identification of the PCB mixtures appeared correct; however, a check on the quantitation of complex PCBs could not be conducted without more information and is often a matter of judgement on the part of the analyst. It was also noted that the low level PCB analyses had high spike recoveries which were outside the quality control limits.

Several comments were made by A. Clark regarding the metals analysis. The spike recoveries for lead, selenium, thallium and tin were quite low. This may indicate there is something in the soil which is binding these metals up or interfering with their analysis. In addition, several lead determinations were made using a standard additions procedure which was not EPA protocol.

Other quality control infomration is maintained in the NUS/FIT Project File for New Bedford Harbor.

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5.0 SUMMARY AND DISCUSSION

A field investigation was conducted on March 10, 1983, at the Acushnet, Co., New Bedford, Massachusetts. Surface grab samples from the soil and adjacent harbor area have been analyzed under the National Contract Laboratory program and have been reported to contain the PCB mixtures Aroclor 1242 and 1254 and metals including lead and chromium.

The highest PCB concentrations were found in New Bedford Harbor intertidal sediment at sampling locations A8 and A9 (see Figure 2). This area included three drainage pipes, two of which were submerged. A grab soil sample from sediment adjacent to the end of the surface drain-pipe (sample location A9) was reported to contain a total PCB concentration of 1220 ppm (dry-weight). Another grab sample taken from these sediments slightly north-east of A9 (sample location A8) was reported to contain a total PCB concentration of 598 ppm (dry-weight). Soil samples taken from areas bordering the Acushnet Company manufacturing plant have total PCB levels ranging from detectable to 30 ppm (dry-weight)

Metals analysis shows a variety of metals present in both soil and sediment samples with high levels of lead being detected at several sampling locations including the intertidal sediments which also contained high chromium levels.

The water sample collected from the southernmost submerged drain-pipe had non-detectable levels of PCBs. Metals analysis indicated lead levels of 75 ppb and a boron concentration of 700 ppb. Turbulence at the outlet of this pipe indicated that drainage was active at this location.

From the limited sampling data available for this site, it appears that the intertidal zone, which is partially impounded, is the most highly contaminated area identified. This assessment is based upon analysis of surface samples for metals and PCBs. Lesser contamination is present in areas directly adjacent to the Acushnet Co. manufacturing plant.

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APPENDIX A

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Case #/SAS #: 1569/439A Laboratory: WCTS, Inc. Sample #: METHOD BLANK
Date Rec'd: 3/15/83 Contract #: SAS# 439A % Moisture: N/A

Organics Analysis Data Sheet

Level/Matrix:		Level/Matrix:	MEDIUM SOIL
QC Report #:		QC Report #:	SAS# 439A-3
Spl→Extract:		Spl→Extract:	BASED ON 0.2g→10mls
Lab Std ID:	NO SAMPLE	Lab Std ID:	8882-94
Lab ID:		Lab ID:	8883-96
Date Analyzed:		Date Extracted:	3/16/83
Circle Units:	ug/Kg, ug/L	Date Analyzed:	3/29/83
		Circle Units:	(ug/Kg) ug/L

Volatile Compounds

2V	acrolein	NA
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	

Pesticides

89P	aldrin	NA
90P	dieldrin	
91P	chlordane	
92P	4,4'-DDT	
93P	4,4'-DDE	
94P	4,4'-DDD	
95P	alpha-endosulfan	
96P	beta-endosulfan	
97P	endosulfan sulfate	
98P	endrin	
99P	endrin aldehyde	
100P	heptachlor	
101P	heptachlor epoxide	
102P	alpha-BHC	
103P	beta-BHC	
104P	gamma-BHC	
105P	delta-BHC	
106P	PCB-1242	5000U
107P	PCB-1254	
108P	PCB-1221	
109P	PCB-1232	
110P	PCB-1248	
111P	PCB-1260	
112P	PCB-1016	
113P	toxaphene	

U- Analyzed for but not detected

K- Detected below quantitation limit

** Detected below GC/MS detection limit

Case #/SAS #: 1569/439A Laboratory: WCTS, Inc. Sample #: METHOD BLANK
Date Rec'd: 3/15/83 Contract #: SAS#439A % Moisture: N/A

Organics Analysis Data Sheet

Level/Matrix:		Level/Matrix:	MEDIUM SOIL
QC Report #:		QC Report #:	SAS# 439A-3
Spl→Extract:		Spl→Extract:	BASED ON 0.2g→10mls
Lab Std ID:	NO SAMPLE	Lab Std ID:	8882-94
Lab ID:		Lab ID:	8883-97
Date Analyzed:		Date Extracted:	3/21/83
Circle Units:	ug/Kg, ug/L	Date Analyzed:	3/29/83
		Circle Units:	(ug/Kg), ug/L

Volatile Compounds

2V	acrolein	N/A
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	

Pesticides

89P	aldrin	N/A
90P	dieldrin	
91P	chlordane	
92P	4,4'-DDT	
93P	4,4'-DDE	
94P	4,4'-DDD	
95P	alpha-endosulfan	
96P	beta-endosulfan	
97P	endosulfan sulfate	
98P	endrin	
99P	endrin aldehyde	
100P	heptachlor	
101P	heptachlor epoxide	
102P	alpha-BHC	
103P	beta-BHC	
104P	gamma-BHC	
105P	delta-BHC	
106P	PCB-1242	5000U
107P	PCB-1254	
108P	PCB-1221	
109P	PCB-1232	
110P	PCB-1248	
111P	PCB-1260	
112P	PCB-1016	
113P	toxaphene	

U- Analyzed for but not detected

K- Detected below quantitation limit

** Detected below GC/MS detection limit

Case #/SAS #: 1569/439A Laboratory: WCTS, Inc. Sample #: METHOD BLANK
Date Rec'd: 3/15/83 Contract #: SAS#439A % Moisture: N/A

Organics Analysis Data Sheet

Level/Matrix:		Level/Matrix:	LOW SOIL
QC Report #:		QC Report #:	SAS#439A-2
Spl→Extract:		Spl→Extract:	BASED ON 5.0g→10ml/s
Lab Std ID:	NO SAMPLE	Lab Std ID:	8882-94
Lab ID:		Lab ID:	8883-98
Date Analyzed:		Date Extracted:	3/21/83
Circle Units:	ug/Kg, ug/L	Date Analyzed:	3/29/83
		Circle Units:	(ug/Kg) ug/L

Volatile Compounds

2V	acrolein	NA
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	

Pesticides

89P	aldrin	NA
90P	dieldrin	
91P	chlordane	
92P	4,4'-DDT	
93P	4,4'-DDE	
94P	4,4'-DDD	
95P	alpha-endosulfan	
96P	beta-endosulfan	
97P	endosulfan sulfate	
98P	endrin	
99P	endrin aldehyde	
100P	heptachlor	
101P	heptachlor epoxide	
102P	alpha-BHC	
103P	beta-BHC	
104P	gamma-BHC	
105P	delta-BHC	
106P	PCB-1242	200U
107P	PCB-1254	
108P	PCB-1221	
109P	PCB-1232	
110P	PCB-1248	
111P	PCB-1260	
112P	PCB-1016	
113P	toxaphene	

U- Analyzed for but not detected

K- Detected below quantitation limit

** Detected below GC/MS detection limit

Case #/SAS #: 1569/439A Laboratory: WCTS, Inc. Sample #: A1394
Date Rec'd: 3/15/83 Contract #: SAS#439A % Moisture: 22.3%

Organics Analysis Data Sheet

Level/Matrix:		Level/Matrix:	LOW SOIL
QC Report #:		QC Report #:	SAS#439A-2
Spl→Extract:		Spl→Extract:	5.04g → 10mls
Lab Std ID:	NO SAMPLE	Lab Std ID:	8892-131
Lab ID:		Lab ID:	8893-132
Date Analyzed:		Date Extracted:	3/21/83
Circle Units:	ug/Kg, ug/L	Date Analyzed:	3/31/83
		Circle Units:	(ug/Kg), ug/L

Volatile Compounds

2V	acrolein	NA
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	

Pesticides

89P	aldrin	NA
90P	dieldrin	
91P	chlordane	
92P	4,4'-DDT	
93P	4,4'-DDE	
94P	4,4'-DDD	
95P	alpha-endosulfan	
96P	beta-endosulfan	
97P	endosulfan sulfate	
98P	endrin	
99P	endrin aldehyde	
100P	heptachlor	
101P	heptachlor epoxide	
102P	alpha-BHC	
103P	beta-BHC	
104P	gamma-BHC	
105P	delta-BHC	
106P	PCB-1242	200U
107P	PCB-1254	2300
108P	PCB-1221	200U
109P	PCB-1232	
110P	PCB-1248	
111P	PCB-1260	
112P	PCB-1016	
113P	toxaphene	

U- Analyzed for but not detected
K- Detected below quantitation limit
** Detected below GC/MS detection limit

1/83

Case #/SAS #: 1569/439 Laboratory: WCTS, Inc. Sample #: A1395
Date Rec'd: 3/15/83 Contract #: SAS#439A % Moisture: 10.4%

Organics Analysis Data Sheet

Level/Matrix:		Level/Matrix:	LOW SOIL
QC Report #:		QC Report #:	SAS#439A-2
Spl→Extract:		Spl→Extract:	5.0g→10ml/s
Lab Std ID:	NO SAMPLE	Lab Std ID:	8882-94
Lab ID:		Lab ID:	8883-99
Date Analyzed:		Date Extracted:	3/21/83
Circle Units:	ug/Kg, ug/L	Date Analyzed:	3/29/83
		Circle Units:	(ug/Kg), ug/L

Volatile Compounds

2V	acrolein	NA
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	

Pesticides

89P	aldrin	NA
90P	dieldrin	
91P	chlordane	
92P	4,4'-DDT	
93P	4,4'-DDE	
94P	4,4'-DDD	
95P	alpha-endosulfan	
96P	beta-endosulfan	
97P	endosulfan sulfate	
98P	endrin	
99P	endrin aldehyde	
100P	heptachlor	
101P	heptachlor epoxide	
102P	alpha-BHC	
103P	beta-BHC	
104P	gamma-BHC	
105P	delta-BHC	
106P	PCB-1242	200U
107P	PCB-1254	400**
108P	PCB-1221	200U
109P	PCB-1232	
110P	PCB-1248	
111P	PCB-1260	
112P	PCB-1016	
113P	toxaphene	

U- Analyzed for but not detected

K- Detected below quantitation limit

** Detected below GC/MS detection limit

Case #/SAS #: 1569/439A Laboratory: WCTS, Inc. Sample #: A1396
Date Rec'd: 3/15/83 Contract #: SAS#439A % Moisture: 50.0%

Organics Analysis Data Sheet

Level/Matrix:		Level/Matrix:	MEDIUM SOIL
QC Report #:		QC Report #:	SAS#439A-3
Spl→Extract:		Spl→Extract:	0.202g → 10 mls
Lab Std ID:	NO SAMPLE	Lab Std ID:	8884-125
Lab ID:		Lab ID:	8885-127
Date Analyzed:		Date Extracted:	3/16/83
Circle Units:	ug/Kg, ug/L	Date Analyzed:	3/30/83
		Circle Units:	(ug/Kg), ug/L

Volatile Compounds

2V	acrolein	NA
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	

Pesticides

89P	aldrin	NA
90P	dieldrin	
91P	chlordane	
92P	4,4'-DDT	
93P	4,4'-DDE	
94P	4,4'-DDD	
95P	alpha-endosulfan	
96P	beta-endosulfan	
97P	endosulfan sulfate	
98P	endrin	
99P	endrin aldehyde	
100P	heptachlor	
101P	heptachlor epoxide	
102P	alpha-BHC	
103P	beta-BHC	
104P	gamma-BHC	
105P	delta-BHC	
106P	PCB-1242	410,000
107P	PCB-1254	200,000
108P	PCB-1221	5000U
109P	PCB-1232	
110P	PCB-1248	
111P	PCB-1260	
112P	PCB-1016	
113P	toxaphene	

U- Analyzed for but not detected
K- Detected below quantitation limit
** Detected below GC/MS detection limit

Case #/SAS #: 1569/439A Laboratory: WCTS, Inc. Sample #: A1397
Date Rec'd: 3/15/83 Contract #: SAS#439A % Moisture: 63.2%

Organics Analysis Data Sheet

Level/Matrix:
QC Report #:
Spl→Extract:
Lab Std ID: NO SAMPLE
Lab ID:
Date Analyzed:
Circle Units: ug/Kg, ug/L

Level/Matrix: MEDIUM SOIL
QC Report #: SAS#439A-3
Spl→Extract: 0.205g → 10ml
Lab Std ID: 8884-113
Lab ID: 8885-114
Date Extracted: 3/16/83
Date Analyzed: 3/30/83
Circle Units: ug/Kg, ug/L

Volatile Compounds

2V	acrolein	NA
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	

Pesticides

89P	aldrin	NA
90P	dieldrin	
91P	chlordane	
92P	4,4'-DDT	
93P	4,4'-DDE	
94P	4,4'-DDD	
95P	alpha-endosulfan	
96P	beta-endosulfan	
97P	endosulfan sulfate	
98P	endrin	
99P	endrin aldehyde	
100P	heptachlor	
101P	heptachlor epoxide	
102P	alpha-BHC	
103P	beta-BHC	
104P	gamma-BHC	
105P	delta-BHC	
106P	PCB-1242	160,000
107P	PCB-1254	60,000
108P	PCB-1221	5000 U
109P	PCB-1232	
110P	PCB-1248	
111P	PCB-1260	
112P	PCB-1016	
113P	toxaphene	

U- Analyzed for but not detected
K- Detected below quantitation limit
** Detected below GC/MS detection limit

Case #/SAS #: 1569/439A Laboratory: WCTS, Inc. Sample #: A1398
Date Rec'd: 3/15/83 Contract #: SAS#439A % Moisture: 17.12

Organics Analysis Data Sheet

Level/Matrix:		Level/Matrix:	LOW SOIL
QC Report #:		QC Report #:	SAS#439A-2
Spl→Extract:		Spl→Extract:	5.06g→10ml/s
Lab Std ID:	NO SAMPLE	Lab Std ID:	8882-101
Lab ID:		Lab ID:	8883-102
Date Analyzed:		Date Extracted:	3/21/83
Circle Units:	ug/Kg, ug/L	Date Analyzed:	3/29/83
		Circle Units:	(ug/Kg), ug/L

Volatile Compounds

2V	acrolein	NA
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	

Pesticides

89P	aldrin	NA
90P	dieldrin	
91P	chlordane	
92P	4,4'-DDT	
93P	4,4'-DDE	
94P	4,4'-DDD	
95P	alpha-endosulfan	
96P	beta-endosulfan	
97P	endosulfan sulfate	
98P	endrin	
99P	endrin aldehyde	
100P	heptachlor	
101P	heptachlor epoxide	
102P	alpha-BHC	
103P	beta-BHC	
104P	gamma-BHC	
105P	delta-BHC	
106P	PCB-1242	200U
107P	PCB-1254	300**
108P	PCB-1221	200U
109P	PCB-1232	
110P	PCB-1248	
111P	PCB-1260	
112P	PCB-1016	
113P	toxaphene	

U- Analyzed for but not detected

K- Detected below quantitation limit

** Detected below GC/MS detection limit

Case #/SAS #: 1569/439A Laboratory: WCTS, Inc. Sample #: A1399
Date Rec'd: 3/15/83 Contract #: SAS#439A % Moisture: 16.2%

Organics Analysis Data Sheet

Level/Matrix:		Level/Matrix:	MEDIUM SOIL
QC Report #:		QC Report #:	SAS#439A-3
Spl→Extract:		Spl→Extract:	0.203g→10mls
Lab Std ID:	NO SAMPLE	Lab Std ID:	8884-113
Lab ID:		Lab ID:	8885-115
Date Analyzed:		Date Extracted:	3/16/83
Circle Units:	ug/Kg, ug/L	Date Analyzed:	3/30/83
		Circle Units:	ug/Kg, ug/L

Volatile Compounds

2V	acrolein	NA
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	

Pesticides

89P	aldrin	NA
90P	dieldrin	
91P	chlordane	
92P	4,4'-DDT	
93P	4,4'-DDE	
94P	4,4'-DDD	
95P	alpha-endosulfan	
96P	beta-endosulfan	
97P	endosulfan sulfate	
98P	endrin	
99P	endrin aldehyde	
100P	heptachlor	
101P	heptachlor epoxide	
102P	alpha-BHC	
103P	beta-BHC	
104P	gamma-BHC	
105P	delta-BHC	
106P	PCB-1242	5000U
107P	PCB-1254	11,000 **
108P	PCB-1221	5000U
109P	PCB-1232	
110P	PCB-1248	
111P	PCB-1260	
112P	PCB-1016	
113P	toxaphene	

U- Analyzed for but not detected

K- Detected below quantitation limit

** Detected below GC/MS detection limit

Case #/SAS #: 1569/439A Laboratory: WCTS, Inc. Sample #: A1400
Date Rec'd: 3/15/83 Contract #: SAS#439A % Moisture: 17.6%

Organics Analysis Data Sheet

Level/Matrix:		Level/Matrix:	MEDIUM SOIL
QC Report #:		QC Report #:	SAS#439A-3
Spl→Extract:		Spl→Extract:	0.205g→10mls
Lab Std ID:	NO SAMPLE	Lab Std ID:	8884-113
Lab ID:		Lab ID:	8885-116
Date Analyzed:		Date Extracted:	3/16/83
Circle Units:	ug/Kg, ug/L	Date Analyzed:	3/30/83
		Circle Units:	ug/Kg, ug/L

Volatile Compounds

2V	acrolein	NA
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	

Pesticides

89P	aldrin	NA
90P	dieldrin	
91P	chlordane	
92P	4,4'-DDT	
93P	4,4'-DDE	
94P	4,4'-DDD	
95P	alpha-endosulfan	
96P	beta-endosulfan	
97P	endosulfan sulfate	
98P	endrin	
99P	endrin aldehyde	
100P	heptachlor	
101P	heptachlor epoxide	
102P	alpha-BHC	
103P	beta-BHC	
104P	gamma-BHC	
105P	delta-BHC	
106P	PCB-1242	5000U
107P	PCB-1254	25,000
108P	PCB-1221	5000U
109P	PCB-1232	
110P	PCB-1248	
111P	PCB-1260	
112P	PCB-1016	
113P	toxaphene	

U- Analyzed for but not detected

K- Detected below quantitation limit

** Detected below GC/MS detection limit

Case #/SAS #: 1569/439A Laboratory: WCTS, Inc. Sample #: A1401
Date Rec'd: 3/15/83 Contract #: SAS#439A % Moisture: 17.9%

Organics Analysis Data Sheet

Level/Matrix:		Level/Matrix:	LOW SOIL
QC Report #:		QC Report #:	SAS#439A-2
Spl→Extract:		Spl→Extract:	5.18g → 10mls
Lab Std ID:	NO SAMPLE	Lab Std ID:	8884-125
Lab ID:		Lab ID:	8885-129
Date Analyzed:		Date Extracted:	3/21/83
Circle Units:	ug/Kg, ug/L	Date Analyzed:	3/30/83
		Circle Units:	(ug/Kg), ug/L

Volatile Compounds

2V	acrolein	NA
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	

Pesticides

89P	aldrin	NA
90P	dieldrin	
91P	chlordane	
92P	4,4'-DDT	
93P	4,4'-DDE	
94P	4,4'-DDD	
95P	alpha-endosulfan	
96P	beta-endosulfan	
97P	endosulfan sulfate	
98P	endrin	
99P	endrin aldehyde	
100P	heptachlor	
101P	heptachlor epoxide	
102P	alpha-BHC	
103P	beta-BHC	
104P	gamma-BHC	
105P	delta-BHC	
106P	PCB-1242	200U
107P	PCB-1254	16,000
108P	PCB-1221	200U
109P	PCB-1232	
110P	PCB-1248	
111P	PCB-1260	
112P	PCB-1016	
113P	toxaphene	

U- Analyzed for but not detected
K- Detected below quantitation limit
** Detected below GC/MS detection limit

Case #/SAS #: 1569/439A Laboratory: WCTS, Inc. Sample #: A1405
Date Rec'd: 3/15/83 Contract #: SAS#439A % Moisture: 10.2%

Organics Analysis Data Sheet

Level/Matrix:		Level/Matrix:	LOW SOIL
QC Report #:		QC Report #:	SAS#439A-2
Spl→Extract:		Spl→Extract:	5.0g→10mls
Lab Std ID:	NO SAMPLE	Lab Std ID:	8882-101
Lab ID:		Lab ID:	8883-105
Date Analyzed:		Date Extracted:	3/21/83
Circle Units:	ug/Kg, ug/L	Date Analyzed:	3/29/83
		Circle Units:	(ug/Kg) ug/L

Volatile Compounds

2V	acrolein	NA
3V	acrylonitrile	↓
4V	benzene	↓
6V	carbon tetrachloride	↓
7V	chlorobenzene	↓
10V	1,2-dichloroethane	↓
11V	1,1,1-trichloroethane	↓
13V	1,1-dichloroethane	↓
14V	1,1,2-trichloroethane	↓
15V	1,1,2,2-tetrachloroethane	↓
16V	chloroethane	↓
17V	bis(chloromethyl)ether	↓
19V	2-chloroethylvinyl ether	↓
23V	chloroform	↓
29V	1,1-dichloroethylene	↓
30V	1,2-trans-dichloroethylene	↓
32V	1,2-dichloropropane	↓
33V	1,3-dichloropropane	↓
38V	ethylbenzene	↓
44V	methylene chloride	↓
45V	methyl chloride	↓
46V	methyl bromide	↓
47V	bromoform	↓
48V	dichlorobromomethane	↓
49V	trichlorofluoromethane	↓
50V	dichlorodifluoromethane	↓
51V	chlorodibromomethane	↓
85V	tetrachloroethylene	↓
86V	toluene	↓
87V	trichloroethylene	↓
88V	vinyl chloride	↓

Pesticides

89P	aldrin	NA
90P	dieldrin	↓
91P	chlordane	↓
92P	4,4'-DDT	↓
93P	4,4'-DDE	↓
94P	4,4'-DDD	↓
95P	alpha-endosulfan	↓
96P	beta-endosulfan	↓
97P	endosulfan sulfate	↓
98P	endrin	↓
99P	endrin aldehyde	↓
100P	heptachlor	↓
101P	heptachlor epoxide	↓
102P	alpha-BHC	↓
103P	beta-BHC	↓
104P	gamma-BHC	↓
105P	delta-BHC	↓
106P	PCB-1242	200U
107P	PCB-1254	↓
108P	PCB-1221	↓
109P	PCB-1232	↓
110P	PCB-1248	↓
111P	PCB-1260	↓
112P	PCB-1016	↓
113P	toxaphene	↓

U- Analyzed for but not detected
K- Detected below quantitation limit
** Detected below GC/MS detection limit

NATIONAL
42-384

Case 1569

PCB Confirmation by GCMS - Samples Analyzed 4/16/83

File Name	Sample #	Confirmation Status
25668P1	100µg/ml PCB 1254 Std	
25668P2	A1394	PCB 1254 Confirmed
25668P3	A1396	PCB's 1242 and 1254 Confirmed
25668P4	A1397	PCB's 1242 and 1254 Confirmed
25668P5	A1400	PCB 1254 Confirmed
25668P6	A1401	PCB 1254 Confirmed

APPENDIX B

DRAFT

4/12/83 SAMPLE MA 8951

Soils are on wet wt basis A4

INORGANICS ANALYSIS DATA SHEET

LAB NAME VERSAR INC.
LAB SAMPLE # 9897

CASE 1569
QC REPORT 58

Note units
Note recovery on Pb, Se, Sn

PROJECT-TASK 793.0000
BATCH NO. 58

TASK 1

	MG/KG		MG/KG
ALUMINUM	3050.000	IRON	4370.000
BARIUM	115.000	MANGANESE	61.500
BERYLLIUM	< 0.250	NICKEL	6.000
BORON	< 5.000	SILVER	< 0.500
CHROMIUM	7.500	VANADIUM	20.000
COBALT	< 2.500	ZINC	101.000
COPPER	42.500		

TASK 2

	MG/KG		MG/KG
ANTIMONY	<1.	MERCURY	<0.1
ARSENIC	3.5	SELENIUM	0.6
CADMIUM	0.35	THALLIUM	<0.5
LEAD	168.	TIN	<1.

TASK 3

	MG/KG
OIL AND GREASE	—
CYANIDE	—
PHENOLICS	—

COMMENTS

1. "C" - BLANK CORRECTED CONC.
2. "ND/B" - NOT DETECTED DUE TO BLANK
3. "S" - SAMPLES ANALYZED BY THE STD. ADDITION METHOD.
4. WITH A DETECTION LIMIT OF
5. WITH A DETECTION LIMIT OF
6. WITH A DETECTION LIMIT OF
7. INSUFFICIENT SAMPLE ALIQUOT
8. INTERFERENCE

W. Niven for RM

ROBERT MAXFIELD, INORG. BRANCH MANAGER.

4/12/83 SAMPLE MA 0952

A 2

INORGANICS ANALYSIS DATA SHEET

LAB NAME VERSAR INC. CASE 1569
LAB SAMPLE # 9898 QC REPORT 58

PROJECT-TASK 793.0000
BATCH NO. 58

TASK 1

	MG/KG		MG/KG
ALUMINUM	7310.000	IRON	14600.000
BARIUM	15.000	MANGANESE	307.000
BERYLLIUM	< 0.250	NICKEL	14.000
BORON	< 5.000	SILVER	< 0.500
CHROMIUM	23.000	VANADIUM	30.000
COBALT	5.000	ZINC	47.000
COPPER	10.000		

TASK 2

	MG/KG		MG/KG
ANTIMONY	<1.	MERCURY	0.1
ARSENIC	4.5	SELENIUM	<0.1
CADMIUM	0.05	THALLIUM	<0.5
LEAD	14.5 *	TIN	<1.

TASK 3

	MG/KG
OIL AND GREASE	—
CYANIDE	—
PHENOLICS	—

* Inadvertently omitted - got it via phone. ou

COMMENTS

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5. WITH A DETECTION LIMIT OF
6. WITH A DETECTION LIMIT OF
7. INSUFFICIENT SAMPLE ALIQUOT
8. INTERFERENCE

WT Nixon for RM

ROBERT MAXFIELD, INORG. BRANCH MANAGER.

4/12/83 SAMPLE MA 8953

A9

INORGANICS ANALYSIS DATA SHEET

LAB NAME VERSAR INC. CASE 1569
LAB SAMPLE # 9899 QC REPORT 58

PROJECT-TASK 793.0000
BATCH NO. 58

TASK 1

	MG/KG		MG/KG
ALUMINUM	4580.000	IRON	10400.000
BARIUM	240.000	MANGANESE	67.500
BERYLLIUM	< 0.250	NICKEL	26.000
BORON	10.000	SILVER	2.500
CHROMIUM	108.000	VANADIUM	50.000
COBALT	< 2.500	ZINC	801.000
COPPER	433.000		

TASK 2

	MG/KG		MG/KG
ANTIMONY	<1.	MERCURY	0.3
ARSENIC	5.	SELENIUM	<0.1
CADMIUM	4.	THALLIUM	<0.5
LEAD	630.	TIN	1.

TASK 3

	MG/KG
OIL AND GREASE	—
CYANIDE	—
PHENOLICS	—

COMMENTS

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3. "S" - SAMPLES ANALYZED BY THE STD. ADDITION METHOD.
. WITH A DETECTION LIMIT OF
5. WITH A DETECTION LIMIT OF
6. WITH A DETECTION LIMIT OF
7. INSUFFICIENT SAMPLE ALIQUOT
8. INTERFERENCE

W Nunn for RM

ROBERT MAXFIELD, INORG. BRANCH MANAGER.

4/12/83 SAMPLE MA 8954

A8

INORGANICS ANALYSIS DATA SHEET

LAB NAME VERSAR INC. CASE 1569
LAB SAMPLE # 9900 QC REPORT 58

PROJECT-TASK 793.0000
BATCH NO. 58

TASK 1

	MG/KG		MG/KG
ALUMINUM	4460.000	IRON	9290.000
BARIUM	65.000	MANGANESE	63.700
BERYLLIUM	< 0.250	NICKEL	46.000
BORON	10.000	SILVER	1.000
CHROMIUM	313.000	VANADIUM	70.000
COBALT	2.500	ZINC	1280.000
COPPER	568.000		

TASK 2

	MG/KG		MG/KG
ANTIMONY	<1.	MERCURY	0.4
ARSENIC	4.	SELENIUM	<0.1
CADMIUM	28.	THALLIUM	<0.5
LEAD	830.	TIN	8.

TASK 3

	MG/KG
OIL AND GREASE	—
CYANIDE	—
PHENOLICS	—

COMMENTS

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3. "S" - SAMPLES ANALYZED BY THE STD. ADDITION METHOD.
4. WITH A DETECTION LIMIT OF
5. WITH A DETECTION LIMIT OF
6. WITH A DETECTION LIMIT OF
7. INSUFFICIENT SAMPLE ALIQUOT
8. INTERFERENCE

W T Wiseman for RM

ROBERT MAXFIELD, INORG. BRANCH MANAGER.

4/12/83

SAMPLE MA 8955

A3

INORGANICS ANALYSIS DATA SHEET

LAB NAME VERSAR INC.
LAB SAMPLE # 9901

CASE 1569
QC REPORT 58

PROJECT-TASK 793.0000
BATCH NO. 58

TASK 1

	MG/KG		MG/KG
ALUMINUM	2200.000	IRON	2690.000
BARIUM	10.000	MANGANESE	57.700
BERYLLIUM	< 0.250	NICKEL	10.000
BORON	< 5.000	SILVER	< 0.500
CHROMIUM	3.000	VANADIUM	20.000
COBALT	< 2.500	ZINC	12.000
COPPER	7.500		

TASK 2

	MG/KG		MG/KG
ANTIMONY	<1.	MERCURY	<0.1
ARSENIC	1.	SELENIUM	<0.1
CADMIUM	0.25	THALLIUM	<0.5
LEAD	83.	TIN	1.

TASK 3

	MG/KG
OIL AND GREASE	—
CYANIDE	—
PHENOLICS	—

COMMENTS

. "C" - BLANK CORRECTED CONC.
. "ND/B" - NOT DETECTED DUE TO BLANK
3. "S" - SAMPLES ANALYZED BY THE STD. ADDITION METHOD.
. WITH A DETECTION LIMIT OF
5. WITH A DETECTION LIMIT OF
6. WITH A DETECTION LIMIT OF
7. INSUFFICIENT SAMPLE ALIQUOT
8. INTERFERENCE

WTNiven for RM

ROBERT MAXFIELD, INORG. BRANCH MANAGER.

4/12/83

SAMPLE MA 8956

A7

INORGANICS ANALYSIS DATA SHEET

LAB NAME VERSAR INC.
LAB SAMPLE # 9902

CASE 1569
QC REPORT 58

PROJECT-TASK 793.0000
BATCH NO. 58

TASK 1

	MG/KG		MG/KG
ALUMINUM	54.600	IRON	5920.000
BARIUM	0.500	MANGANESE	4.000
BERYLLIUM	< 0.005	NICKEL	0.160
BORON	0.100	SILVER	< 0.010
CHROMIUM	0.180	VANADIUM	0.200
COBALT	< 0.050	ZINC	1.770
COPPER	1.650		

TASK 2

	MG/KG		MG/KG
ANTIMONY	<1.	MERCURY	<0.1
ARSENIC	7.	SELENIUM	<0.1
CADMIUM	0.1	THALLIUM	<0.5
LEAD	212.	TIN	1.

TASK 3

	MG/KG
OIL AND GREASE	—
CYANIDE	—
PHENOLICS	—

COMMENTS

1. "C" - BLANK CORRECTED CONC.
2. "ND/B" - NOT DETECTED DUE TO BLANK
3. "S" - SAMPLES ANALYZED BY THE STD. ADDITION METHOD.
4. WITH A DETECTION LIMIT OF
5. WITH A DETECTION LIMIT OF
6. WITH A DETECTION LIMIT OF
7. INSUFFICIENT SAMPLE ALIQUOT
8. INTERFERENCE

WJ Niven for RM

ROBERT MAXFIELD, INORG. BRANCH MANAGER.

4/12/83

SAMPLE MA 8957

A6

INORGANICS ANALYSIS DATA SHEET

LAB NAME VERSAR INC.
LAB SAMPLE # 9903

CASE 1569
QC REPORT 58

PROJECT-TASK 793.0000
BATCH NO. 58

TASK 1

	MG/KG		MG/KG
ALUMINUM	2900.000	IRON	4380.000
BARIUM	65.000	MANGANESE	103.000
BERYLLIUM	< 0.250	NICKEL	12.000
BORON	< 5.000	SILVER	< 0.500
CHROMIUM	14.000	VANADIUM	30.000
COBALT	< 2.500	ZINC	87.500
COPPER	45.000		

TASK 2

	MG/KG		MG/KG
ANTIMONY	<1.	MERCURY	<0.1
ARSENIC	1.5	SELENIUM	<0.1
CADMIUM	0.4	THALLIUM	<0.5
LEAD	278.	TIN	3

TASK 3

	MG/KG
OIL AND GREASE	—
CYANIDE	—
PHENOLICS	—

COMMENTS

1. "C" - BLANK CORRECTED CONC.
2. "ND/B" - NOT DETECTED DUE TO BLANK
3. "S" - SAMPLES ANALYZED BY THE STD. ADDITION METHOD.
4. WITH A DETECTION LIMIT OF
5. WITH A DETECTION LIMIT OF
6. WITH A DETECTION LIMIT OF
7. INSUFFICIENT SAMPLE ALIQUOT
8. INTERFERENCE

WZ Niven for RM

ROBERT MAXFIELD, INORG. BRANCH MANAGER.

4/12/83 SAMPLE MA 8958

A1

INORGANICS ANALYSIS DATA SHEET

LAB NAME VERSAR INC.
LAB SAMPLE # 9904

CASE 1569
QC REPORT 58

PROJECT-TASK 793.0000
BATCH NO. 58

TASK 1

	MG/KG		MG/KG
ALUMINUM	2420.000	IRON	3850.000
BARIUM	15.000	MANGANESE	101.000
BERYLLIUM	< 0.250	NICKEL	8.000
BORON	< 5.000	SILVER	< 0.500
CHROMIUM	4.500	VANADIUM	40.000
COBALT	< 2.500	ZINC	42.500
COPPER	30.000		

TASK 2

	MG/KG		MG/KG
ANTIMONY	<1.	MERCURY	<0.1
ARSENIC	1.5	SELENIUM	<0.1
CADMIUM	0.2	THALLIUM	<0.5
LEAD	144.	TIN	3.

TASK 3

	MG/KG
OIL AND GREASE	—
CYANIDE	—
PHENOLICS	—

COMMENTS

1 "C" - BLANK CORRECTED CONC.
2 "ND/B" - NOT DETECTED DUE TO BLANK
3. "S" - SAMPLES ANALYZED BY THE STD. ADDITION METHOD.
4 WITH A DETECTION LIMIT OF
5. WITH A DETECTION LIMIT OF
6. WITH A DETECTION LIMIT OF
7. INSUFFICIENT SAMPLE ALIQUOT
8. INTERFERENCE

WTWiven for RM

ROBERT MAXFIELD, INORG. BRANCH MANAGER.

4/12/83 SAMPLE MA 8962 Field Blank

C4

INORGANICS ANALYSIS DATA SHEET

LAB NAME VERSAR INC. CASE 1569
LAB SAMPLE # 9908 QC REPORT 58

PROJECT-TASK 793.0000
BATCH NO. 58

TASK 1

	MG/KG		MG/KG
ALUMINUM	4310.000	IRON	4080.000
BARIUM	10.000	MANGANESE	42.000
BERYLLIUM	< 0.250	NICKEL	4.000
BORON	< 5.000	SILVER	< 0.500
CHROMIUM	5.500	VANADIUM	< 10.000
COBALT	< 2.500	ZINC	8.500
COPPER	5.000		

TASK 2

	MG/KG		MG/KG
ANTIMONY	<1.	MERCURY	<0.1
ARSENIC	4.5	SELENIUM	<0.1 "6"
CADMIUM	<0.05	THALLIUM	<0.5
LEAD	4.8 "S" *	TIN	<1. "S"

TASK 3

	MG/KG
OIL AND GREASE	—
CYANIDE	—
PHENOLICS	—

* Not a true std additions procedure as defined in EPA manual
- unspiked sample value = 3.0 with 68% recovery on spiked portion.

COMMENTS
1. "C" - BLANK CORRECTED CONC.
2. "ND/B" - NOT DETECTED DUE TO BLANK
3. "S" - SAMPLES ANALYZED BY THE STD. ADDITION METHOD.
4. WITH A DETECTION LIMIT OF
5. WITH A DETECTION LIMIT OF
6. WITH A DETECTION LIMIT OF
7. INSUFFICIENT SAMPLE ALIQUOT
8. INTERFERENCE

WWiven for RM

ROBERT MAXFIELD, INORG. BRANCH MANAGER.

4/12/83

SAMPLE MA 8965

AW10

INORGANICS ANALYSIS DATA SHEET

LAB NAME VERSAR INC.
LAB SAMPLE # 9909 9910

CASE 1569
QC REPORT 58

PROJECT-TASK 793.0000
BATCH NO. 58

TASK 1

	UG/L		UG/L
ALUMINUM	200.	IRON	500.
BARIUM	< 100.	MANGANESE	30.
BERYLLIUM	< 5.	NICKEL	< 40.
BORON	700.	SILVER	< 10.
CHROMIUM	< 10.	VANADIUM	< 200.
COBALT	< 50.	ZINC	70.
COPPER	< 50.		

TASK 2

	UG/L		UG/L
ANTIMONY	<20.	MERCURY	<0.2
ARSENIC	<10.	SELENIUM	<2. "S"
CADMIUM	< 1.	THALLIUM	<10. "S"
LEAD	* 75. "S"	TIN	— 8

↳ on QC sheet, reported <20, with recovery of 64% for spike

TASK 3

	UG/L
OIL AND GREASE	—
CYANIDE	—
PHENOLICS	—

* On QC sheet, reported value of 52., which was adjusted for spike recovery. - This "Std additions" technique is not a true std additions method as EPA manual defines it.

COMMENTS

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3. "S" - SAMPLES ANALYZED BY THE STD. ADDITION METHOD.
4. WITH A DETECTION LIMIT OF
5. WITH A DETECTION LIMIT OF
6. WITH A DETECTION LIMIT OF
7. INSUFFICIENT SAMPLE ALIQUOT
8. INTERFERENCE

WZNiven for RM

ROBERT MAXFIELD, INORG. BRANCH MANAGER.

APPENDIX C

DRAFT

FILE COPY 02039

1. COST CENTER:	REM/FIT ZONE CONTRACT TECHNICAL DIRECTIVE DOCUMENT (TDD)	2. NO.:
ACCOUNT NO.:		F1-8302-01

3. PRIORITY:	4. ESTIMATE OF TECHNICAL HOURS:	5. EPA SITE ID:	6. COMPLETION DATE:	7. REFERENCE INFO.:
[X] HIGH [ ] MEDIUM [ ] LOW	100	MAD 980731335	4-29-83	[X] YES [ ] NO [X] ATTACHED [ ] PICK UP
	4A. ESTIMATE OF SUBCONTRACT COST:	5A. EPA SITE NAME: New Bedford Harbor		

8. GENERAL TASK DESCRIPTION: Site inspections of 3 facilities, Develop a property Map.

9. SPECIFIC ELEMENTS:

1. Sampling and analysis at Acushnet Process Co.
2. Sampling and analysis at New Bedford Gas and Edison Light Co.
3. Sampling and analysis at conrail yard, New Bedford
4. Map shoreline in dustrial properties in New Bedford, Acushnet and fairhaven. list properties owners from 1940 to present.

10. INTERIM DEADLINES:

DESIRED REPORT FORM: FORMAL REPORT [ ] LETTER REPORT [ ] BRIEFING [ ]

OTHER (SPECIFY):

12. COMMENTS: Coordinate with Gerry Sotolango (223-5775)

13. AUTHORIZING RPO: Donald R. Smith (SIGNATURE) — Donald R. Smith

14. DATE: 2-14-83

15. RECEIVED BY: [X] ACCEPTED [ ] ACCEPTED WITH EXCEPTIONS [ ] REJECTED

Paul F. Clay (CONTRACTOR RPM SIGNATURE)

Paul F. Clay

16. DATE: 2/14/83

Sheet 1	White – FITL Copy	Sheet 3	Pink – Contracting Officer's Copy (Washington, D. C.)
Sheet 2	Canary – DPO Copy	Sheet 4	Goldenrod – Project Officer's Copy (Washington, D. C.)