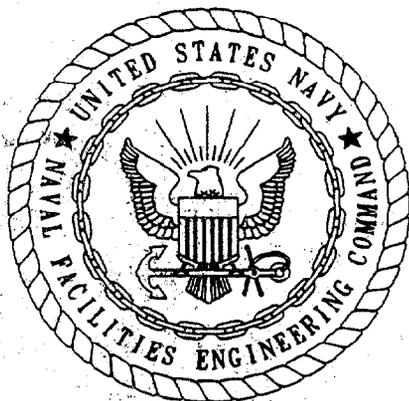


N00213.AR.000099
NAS KEY WEST
5090.3a

CONTAMINATION ASSESSMENT REPORT ADDENDUM BERTHING WHARF BUILDING 189
TRUMAN ANNEX NAS KEY WEST FL
11/1/1993
ABB ENVIRONMENTAL SERVICES INC



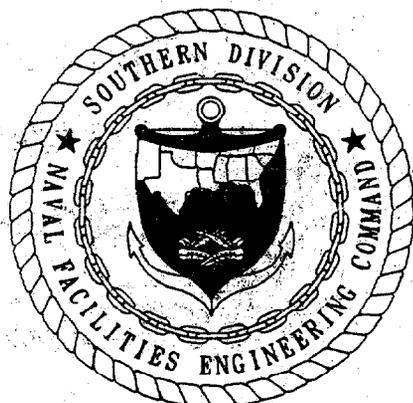
**CONTAMINATION ASSESSMENT REPORT
ADDENDUM**

**BERTHING WHARF
BUILDING 189, TRUMAN ANNEX**

**NAVAL AIR STATION KEY WEST
KEY WEST, FLORIDA**

**NAVY CLEAN - DISTRICT I
CONTRACT NO. N62467-89-D-0317**

NOVEMBER 1993



**SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORTH CHARLESTON, SOUTH CAROLINA
29419-9010**

**CONTAMINATION ASSESSMENT REPORT
ADDENDUM**

**BERTHING WHARF
BUILDING 189, TRUMAN ANNEX
NAVAL AIR STATION KEY WEST
KEY WEST, FLORIDA**

Unit Identification Code (UIC): N00213

Contract No. 62467-89-D-0317

Prepared by:

**ABB Environmental Services, Inc.
2590 Executive Center Circle, East
Tallahassee, Florida 32301**

Authors:

**Roger Durham, Senior Geologist
Pamela J. Wagner, Geologist**

Prepared for:

**Department of the Navy, Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29418**

Luis Vazquez, Code 1843, Engineer-in-Charge

November 1993



FOREWORD

Subtitle I of the Hazardous and Solid Waste Amendments of 1984 to the Solid Waste Disposal Act (SWDA) of 1965 established a national regulatory program for managing underground storage tanks (USTs) containing hazardous materials, especially petroleum products. Hazardous wastes stored in USTs were already regulated under the Resource Conservation and Recovery Act of 1976, which was also an amendment to SWDA. Subtitle I requires that the U.S. Environmental Protection Agency (USEPA) promulgate UST regulations. The program was designed to be administered by the individual States, who were allowed to develop more stringent standards, but not less stringent standards. Local governments were permitted to establish regulatory programs and standards that are more stringent, but not less stringent than either State or Federal regulations. The USEPA UST regulations are found in the Code of Federal Regulations (CFR), Title 40, Part 280 (40 CFR 280) (*Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks*) and Title 40, Part 281 (*Approval of State Underground Storage Tank Programs*). Title 40, Part 280, was revised and published on September 23, 1988, and became effective December 22, 1988.

The Navy's UST program policy is to comply with all Federal, State, and local regulations pertaining to USTs. This report was prepared to satisfy the requirements of Chapter 17-770, Florida Administrative Code (FAC) (*State Underground Petroleum Environmental Response*), regulations on petroleum contamination in Florida's environment as a result of spills or leaking tanks or piping.

Questions regarding this report should be addressed to the Environmental Coordinator, Naval Air Station, Key West, Florida, at 305-293-2194, or to Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), Code 1843, at DSN 563-0613 or 803-743-0613.

ACKNOWLEDGMENTS

In preparing this report, the Underground Storage Tank Section of the Comprehensive Long-Term Environmental Action, Navy group at ABB Environmental Services, Inc., commends the support, assistance, and cooperation provided by the personnel of the Naval Air Station Key West, Key West, Florida, and Southern Division, Naval Facilities Engineering Command.

TABLE OF CONTENTS

Contamination Assessment Report Addendum
Berthing Wharf
Building 189, Truman Annex
Naval Air Station, Key West, Florida

Section	Title	Page No.
1.0	INTRODUCTION	1-1
2.0	SITE BACKGROUND	2-1
2.1	SITE DESCRIPTION AND HISTORY	2-1
2.2	1991 SITE INVESTIGATION	2-1
2.3	SCOPE OF SUPPLEMENTAL INVESTIGATION	2-4
2.4	SUPPLEMENTAL FIELD INVESTIGATION, MARCH 27, 1993	2-4
3.0	SUPPLEMENTAL FIELD INVESTIGATION, JUNE 1993	3-1
3.1	METHODOLOGIES AND EQUIPMENT	3-1
3.1.1	Soil Sampling	3-1
3.1.2	Monitoring Well Construction	3-1
3.1.3	Water Table Elevation Measurements	3-1
3.1.4	Groundwater Sampling and Analyses	3-7
3.1.5	Sediment Sampling and Analysis	3-7
3.2	SOIL ASSESSMENT RESULTS	3-7
3.3	GROUNDWATER ASSESSMENT RESULTS	3-7
3.3.1	Groundwater Flow Direction	3-7
3.3.2	Groundwater Contamination, June 8 and June 10, 1993	3-7
3.3.3	Persistence of TRPH Contamination	3-10
3.3.4	Free Product Contamination	3-10
3.4	SEDIMENT SAMPLE RESULTS	3-12
4.0	SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS	4-1
4.1	SUMMARY	4-1
4.2	CONCLUSIONS	4-1
4.3	RECOMMENDATIONS	4-3
5.0	PROFESSIONAL REVIEW CERTIFICATION	5-1

REFERENCES

APPENDICES

- Appendix A: FDEP Correspondence and Meeting Minutes
- Appendix B: Groundwater Analytical Data
- Appendix C: Lithologic Logs
- Appendix D: Laboratory Analytical Data for Sediment Sample Collected June 10, 1993

LIST OF FIGURES

Contamination Assessment Report Addendum
Berthing Wharf
Building 189, Truman Annex
Naval Air Station, Key West, Florida

<u>Figure</u>	<u>Title</u>	<u>Page No.</u>
1-1	Facility Location Map	1-2
2-1	Site Plan	2-2
2-2	Soil and Groundwater Contamination Distribution Map, July and August 1991	2-3
2-3	Groundwater Contamination Distribution Map, March 27, 1993	2-6
3-1	Supplemental Soil Boring, Monitoring Well, and Sediment Sample Locations	3-2
3-2	Monitoring Well Installation Detail	3-3
3-3	Water Table Elevation Contour Map, Surficial Zone, March 27, 1993	3-5
3-4	Water Table Elevation Contour Map, Surficial Zone, June 10, 1993	3-6
3-5	Groundwater Contamination Distribution Map, June 8 and 10, 1993	3-9
4-1	Soil, Sediment, and Groundwater Contamination Distribution Summary	4-2
4-2	Sediment Sample Locations at Electric Power Plant Site (Building 103)	4-4

LIST OF TABLES

<u>Table</u>	<u>Title</u>	<u>Page No.</u>
3-1	Top of Casing and Groundwater Elevations, March 27 and June 10, 1993	3-4
3-2	Summary of Organic Vapor Analyzer (OVA) Soil Sample Results, June 7 Through June 10, 1993	3-8
3-3	Comparison of Total Recoverable Petroleum Hydrocarbons (TRPH) Groundwater Concentrations, August 1991 to June 1993	3-11
3-4	Summary of Sediment Sample Laboratory Analyses, June 10, 1993	3-13

GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
bls	below land surface
CA	contamination assessment
CAP	Contamination Assessment Plan
CAR	Contamination Assessment Report
CFR	Code of Federal Regulations
CompQAPP	Comprehensive Quality Assurance Program Plan
CTO	Contract Task Order
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FDER	Florida Department of Environmental Regulation
MOP	Monitoring Only Plan
NAS	Naval Air Station
OVA	organic vapor analyzer
PAHs	polynuclear aromatic hydrocarbons
POA	Plan of Action
ppb	parts per billion
ppm	parts per million
PVC	polyvinyl chloride
RAP	remedial action plan
SOUTHNAV- FACENGC	Southern Division, Naval Facilities Engineering Command
SWDA	Solid Waste Disposal Act of 1965
TIC	tentatively identified compound
TRPH	total recoverable petroleum hydrocarbons
UIC	uniform identification code
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
UST	underground storage tank
VOA	volatile organic aromatic
VOC	volatile organic compound

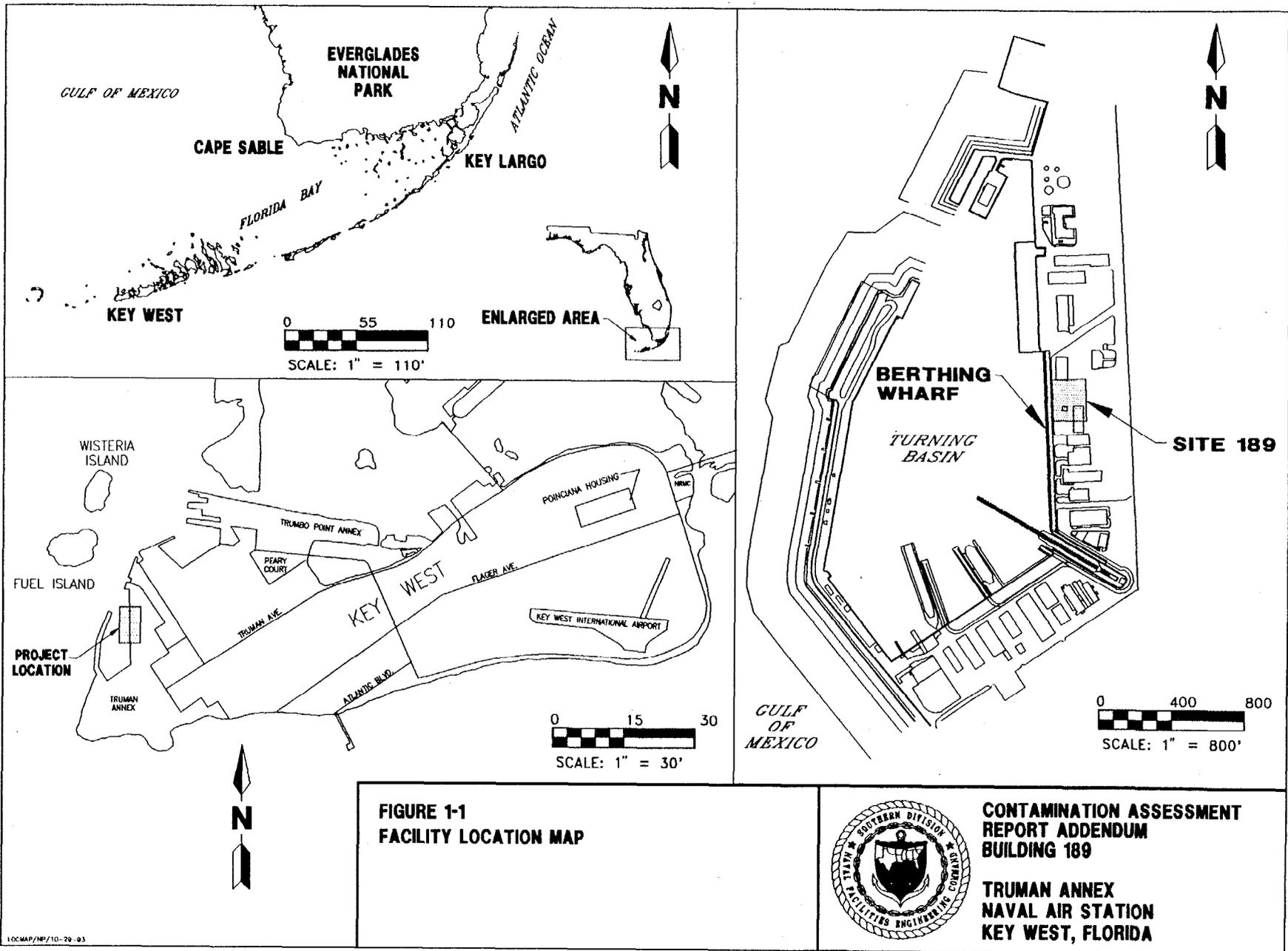
1.0 INTRODUCTION

Naval Air Station (NAS) Key West is located approximately 150 miles southwest of Miami in Monroe County, Florida (Figure 1-1). NAS Key West, a complex of activities located in numerous areas of the lower Florida Keys, encompasses approximately 5,000 acres. The majority of these activities are concentrated on Boca Chica Key and Key West. The mission of NAS Key West is to maintain and operate facilities and provide services and materials to support operations of aviation activities and units designated by the Chief of Naval Operations.

ABB Environmental Services, Inc. (ABB-ES), was contracted by Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) to perform a contamination assessment (CA) and submit a Contamination Assessment Report (CAR) for the reported release of petroleum product at the Berthing Wharf (near Building 189), Truman Annex, NAS Key West, hereafter referred to as Site 189 (Figure 1-1). The Berthing Wharf is located along the western boundary of the site and extends north and south of the site area. The scope of services is described in Contract Task Order (CTO) No. 007, the Plan of Action (POA), and the Contamination Assessment Plan (CAP) and included the following:

- drilling soil borings and analyzing site soil samples to assess the extent of soil petroleum contamination,
- installing and sampling groundwater monitoring wells to assess the extent of groundwater petroleum contamination,
- collecting water level data to assess the groundwater flow direction and hydraulic gradient at the site,
- conducting a potable water well inventory within a 0.25-mile radius of the site,
- conducting slug tests to estimate aquifer characteristics, and
- reducing and analyzing pertinent data gathered during the CA to complete a CAR.

The CA at Site 189 was conducted during July and August 1991. In February 1992, a CAR was submitted to the Florida Department of Environmental Protection (FDEP). At the request of FDEP, a supplemental field investigation was performed during March and June 1993. This report is an addendum to the CAR, and presents the findings and conclusions of the supplemental field investigation.



**FIGURE 1-1
FACILITY LOCATION MAP**



**CONTAMINATION ASSESSMENT
REPORT ADDENDUM
BUILDING 189**

**TRUMAN ANNEX
NAVAL AIR STATION
KEY WEST, FLORIDA**

2.0 SITE BACKGROUND

2.1 SITE DESCRIPTION AND HISTORY. There are three existing structures at the site: Building 159, Building 189, and MG House 3 (Figure 2-1). Buildings 159 and 189 are located near the southern edge of the site. MG House 3 is located in the wharf area on the western part of the site. Much of the area east of the wharf and north of Buildings 159 and 189 is unpaved. East of the site, a fence separates a residential area from the facility. The Berthing Wharf is located along the western margin of the site. The wharf area is approximately 65 feet wide and is concreted. The western margin of the wharf is demarcated by a reinforced concrete seawall oriented in a north-south direction. The seawall extends to a depth of approximately 53 feet below land surface (bls) and forms the eastern side of a turning basin. The turning basin was formerly used to dock Naval vessels.

During reconstruction of the wharf in 1989, a north-south oriented Bunker C fuel oil pipeline was discovered approximately 25 feet west of Building 189. The pipeline was broken prior to or during wharf reconstruction activities, resulting in the release of petroleum. An east-west oriented spur of the pipeline was also discovered east of MG House 3 in an area paved with asphalt.

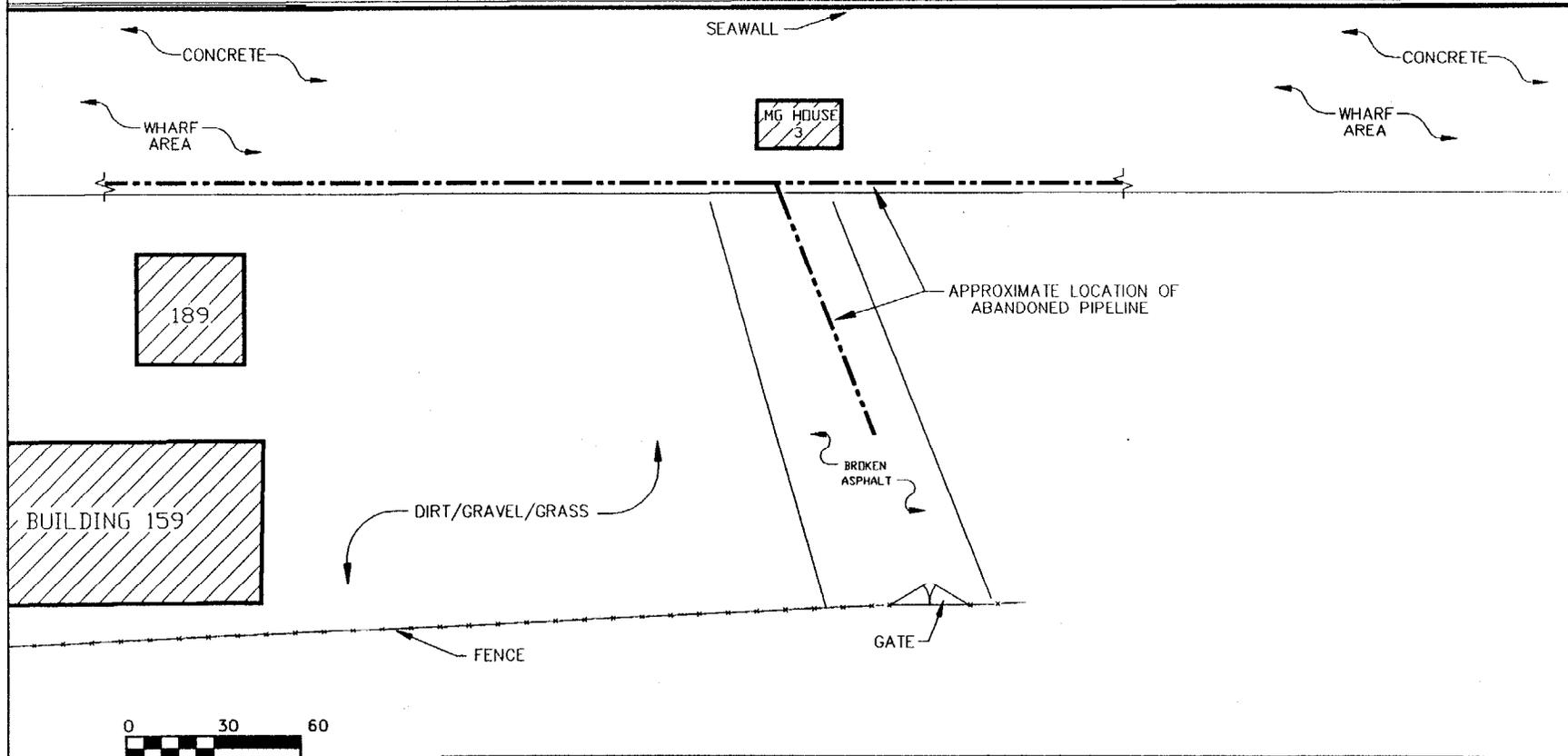
The sections of the pipeline discovered at the site and much of the contaminated soil were removed during wharf reconstruction activities. NAS Key West Public Works Department personnel were unable to provide information regarding where the excavated soil and pipeline were transported. The area where the former north-south pipeline was discovered was resurfaced with concrete. The area where the former east-west spur was found is now covered by broken asphalt.

2.2 1991 SITE INVESTIGATION. During the site investigation conducted July through August 1991, 13 soil borings, KYW-189-SB-1 through KYW-189-SB-13, were drilled and nine monitoring wells, KYW-189-MW-1 through KYW-189-MW-9, were installed. Soil boring and monitoring well locations are shown in Figure 2-2. For simplicity, the prefix (KYW-189-) has been deleted from soil boring and monitoring well designations in the text, tables, and figures of this report.

Soil samples were collected from each boring and analyzed for volatile organic compounds (VOCs) by organic vapor analyzer (OVA) headspace techniques. Groundwater samples were collected from monitoring wells and analyzed for constituents of the kerosene analytical group in accordance with Chapter 17-770, Florida Administrative Code (FAC). A CAR was submitted to the Navy and FDEP in February 1992. The findings of the CAR are summarized below.

- Sediments from the surface to depths of 5 to 6 feet bls appear to be fill material, composed of tan to brown calcareous sand with limestone cobbles. The fill material is underlain by tan to light gray to white, weathered limestone.
- Petroleum-contaminated soil (OVA headspace readings greater than 10 parts per million [ppm]) was identified in only two soil borings, SB-3 and the boring for MW-2. No excessively petroleum-contaminated soil (OVA headspace readings greater than 50 ppm) was detected at the site.

TURNING BASIN



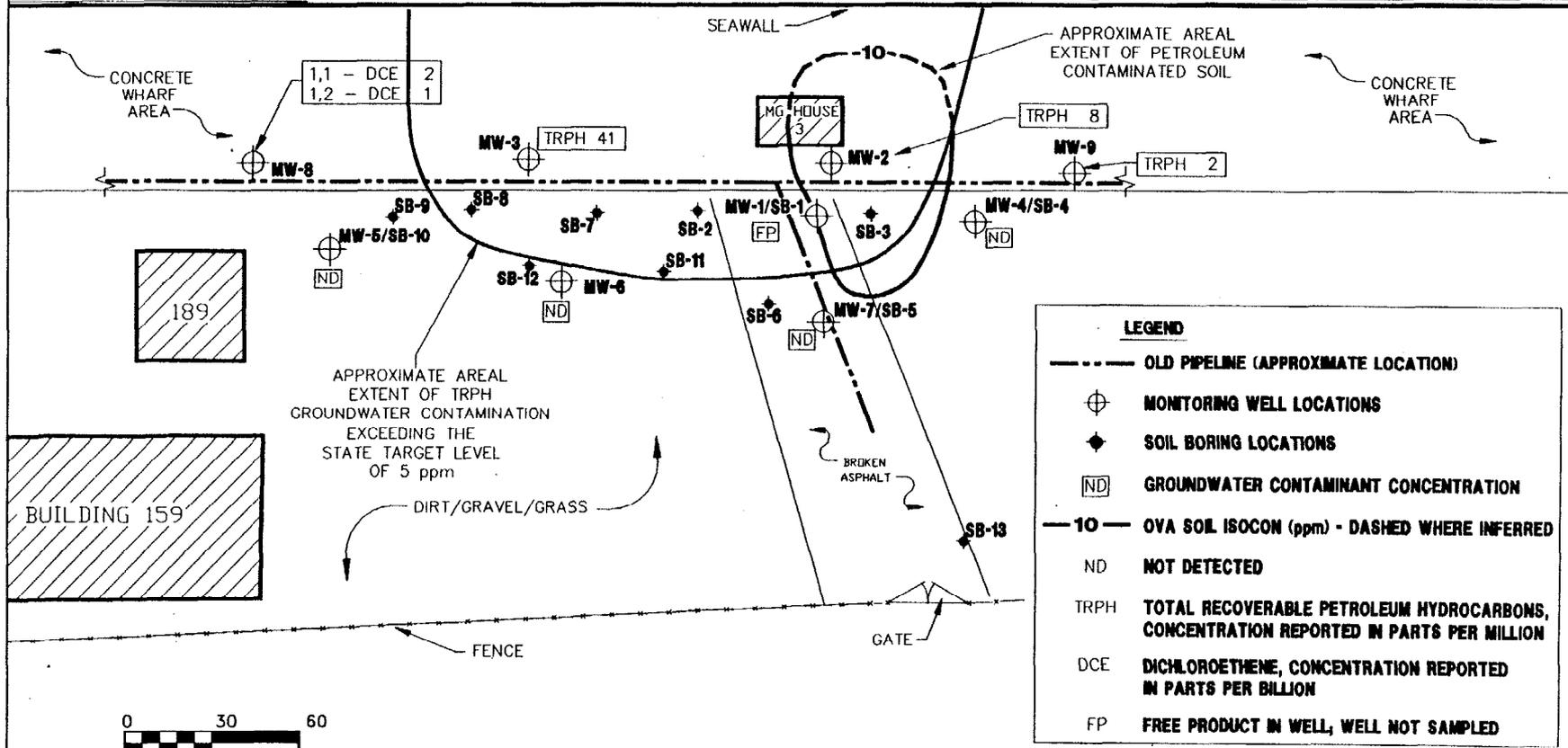
0 30 60
SCALE: 1" = 60'

**FIGURE 2-1
SITE PLAN**



**CONTAMINATION ASSESSMENT
REPORT ADDENDUM
SITE 189**
**TRUMAN ANNEX
NAVAL AIR STATION
KEY WEST, FLORIDA**

TURNING BASIN



LEGEND

- OLD PIPELINE (APPROXIMATE LOCATION)
- ⊕ MONITORING WELL LOCATIONS
- ◆ SOIL BORING LOCATIONS
- ND GROUNDWATER CONTAMINANT CONCENTRATION
- 10 — OVA SOIL ISOCON (ppm) - DASHED WHERE INFERRED
- ND NOT DETECTED
- TRPH TOTAL RECOVERABLE PETROLEUM HYDROCARBONS, CONCENTRATION REPORTED IN PARTS PER MILLION
- DCE DICHLOROETHENE, CONCENTRATION REPORTED IN PARTS PER BILLION
- FP FREE PRODUCT IN WELL, WELL NOT SAMPLED

**FIGURE 2-2
SOIL AND GROUNDWATER
CONTAMINATION DISTRIBUTION MAP,
JULY AND AUGUST 1991**



**CONTAMINATION ASSESSMENT
REPORT ADDENDUM
SITE 189**

**TRUMAN ANNEX
NAVAL AIR STATION
KEY WEST, FLORIDA**

The areal extent of soil contamination estimated from OVA headspace analysis of soil boring samples is shown in Figure 2-2.

- Groundwater was encountered at depths of 5 to 7 feet bls and is classified as G-III (McKenzie, 1990).
- Groundwater flow direction at the site is predominantly to the west. A tidal influence study conducted August 13, 1993, indicates that tidal fluctuations cause groundwater elevation changes of up to 1 foot and reverse the groundwater flow direction at the site during high tide.
- Free product was detected in monitoring well MW-1, located approximately 25 feet east of MG House 3. The apparent thickness of free product in this monitoring well was 0.05 foot.
- Concentrations of total recoverable petroleum hydrocarbons (TRPH) detected in samples collected from monitoring wells MW-2, MW-3, and MW-9 were 8 ppm, 41 ppm, and 2 ppm, respectively (Figure 2-2). The State target level for TRPH in G-III groundwater is 5 ppm. The approximate areal extent of TRPH groundwater contamination exceeding the State target level is depicted in Figure 2-2.
- The compounds 1,1-dichloroethene and 1,2-dichloroethene were detected in the sample collected from monitoring well MW-8 at concentrations of 2 parts per billion (ppb) and 1 ppb, respectively. These contaminant concentrations are less than the State recommended guidance concentrations of 7 ppb and 4.2 ppb, respectively (FDER, February 1989).
- No contaminants were detected in the samples collected from monitoring wells MW-4 through MW-7.

A Monitoring Only Plan (MOP) was submitted in the CAR. The MOP recommended quarterly groundwater sampling of monitoring wells MW-1, MW-2, and MW-7 for a period of 1 year. Samples were to be analyzed for constituents of the kerosene analytical group as defined in Chapter 17-770, FAC.

Upon completion of the CAR review, FDEP requested initial remedial action be implemented to remove free product and supplemental groundwater sample collection at the site.

2.3 SCOPE OF SUPPLEMENTAL INVESTIGATION. The scope of services for this CAR addendum was developed to conform to the supplemental field activities requested in the April 22, 1992, FDEP Interoffice Memorandum (see Appendix A). The scope of services requested by FDEP included free product recovery from monitoring well MW-1, and collection and analysis of groundwater samples from monitoring wells MW-1, MW-2, MW-3, and MW-5. The groundwater samples were to be analyzed for parameters included in U.S. Environmental Protection Agency (USEPA) Methods 418.1, 601, 602, and 610.

2.4 SUPPLEMENTAL FIELD INVESTIGATION, MARCH 27, 1993. A supplemental field investigation was conducted on March 27, 1993. Groundwater samples were collected from monitoring wells MW-1, MW-2, MW-3, and MW-5. A duplicate sample

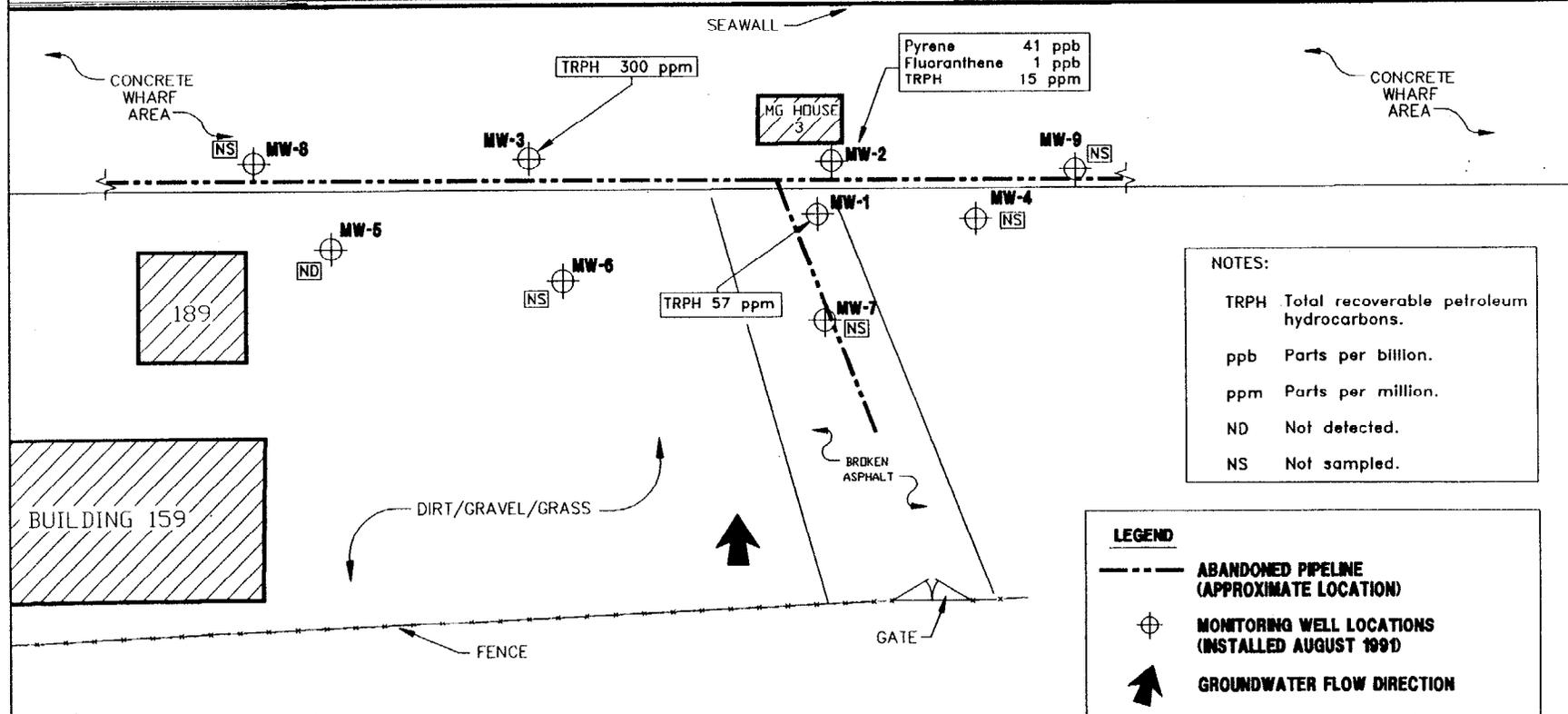
was collected from monitoring well MW-2. No measurable free product (less than 0.01-foot thick) was detected in any monitoring well at the site, including monitoring well MW-1; however, free product believed to be Bunker C fuel was observed on the bailer during the sampling of monitoring well MW-3.

Groundwater analytical data sheets for groundwater samples collected March 27, 1993, are attached in Appendix B, Groundwater Analytical Data. The distribution of compounds detected in groundwater samples collected on March 27, 1993, is shown in Figure 2-3. TRPH concentrations in the samples collected from monitoring wells MW-1, MW-2, and MW-3, were 57 ppm, 15 ppm, and 300 ppm, respectively. Fluoranthene and pyrene were detected in the sample collected from monitoring well MW-2 at concentrations of 1 ppb and 41 ppb, respectively. No contaminants were detected in the sample collected from monitoring well MW-5.

A meeting was held with FDEP on May 26, 1993, to discuss the findings of the supplemental investigation and to agree upon an appropriate course of action to complete the CA at the site. The meeting minutes are summarized in the ABB-ES memorandum dated May 26, 1993 (see Appendix A). It was agreed that the following field activities be conducted at the site.

- Additional monitoring wells would be installed to further assess the areal extent of groundwater contamination.
- A vertical extent well would be installed to investigate if petroleum contaminants are migrating under the seawall into the turning basin.
- Groundwater samples would be collected from all site monitoring wells for TRPH analysis by USEPA Method 418.1.
- A sediment sample would be collected from a location along the seaward side of the seawall for analysis of petroleum constituents.

TURNING BASIN



**FIGURE 2-3
GROUNDWATER CONTAMINATION
DISTRIBUTION MAP,
MARCH 27, 1993**



**CONTAMINATION ASSESSMENT
REPORT ADDENDUM
SITE 189**

**TRUMAN ANNEX
NAVAL AIR STATION
KEY WEST, FLORIDA**

3.0 SUPPLEMENTAL FIELD INVESTIGATION, JUNE 1993

3.1 METHODOLOGIES AND EQUIPMENT. The field investigation activities agreed upon in the May 26, 1993, meeting were conducted in June 1993. All methodologies and equipment used during this field investigation were in conformance with the ABB-ES, FDEP-approved, Comprehensive Quality Assurance Program Plan (CompQAPP).

3.1.1 Soil Sampling Four additional soil borings (SB-14 through SB-17) were drilled at the site (Figure 3-1), using rotary drilling and hollow-stem augers. Soil borings SB-14 through SB-16 were advanced to a depth of 13 feet bls. Soil boring SB-17 was advanced to a depth of 35 feet bls.

Soil samples were collected from soil borings SB-14 through SB-17 at depths of 1 foot bls, 3 feet bls, and 5 feet bls and analyzed by OVA headspace techniques. Groundwater was encountered at depths ranging from approximately 5 to 6 feet bls in each boring. Soil samples were collected below the water table at 5-foot intervals to the total depth of the boring. Lithologic logs describing subsurface material encountered in borings SB-14 through SB-17 are attached in Appendix C, Lithologic Logs.

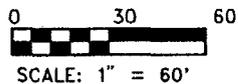
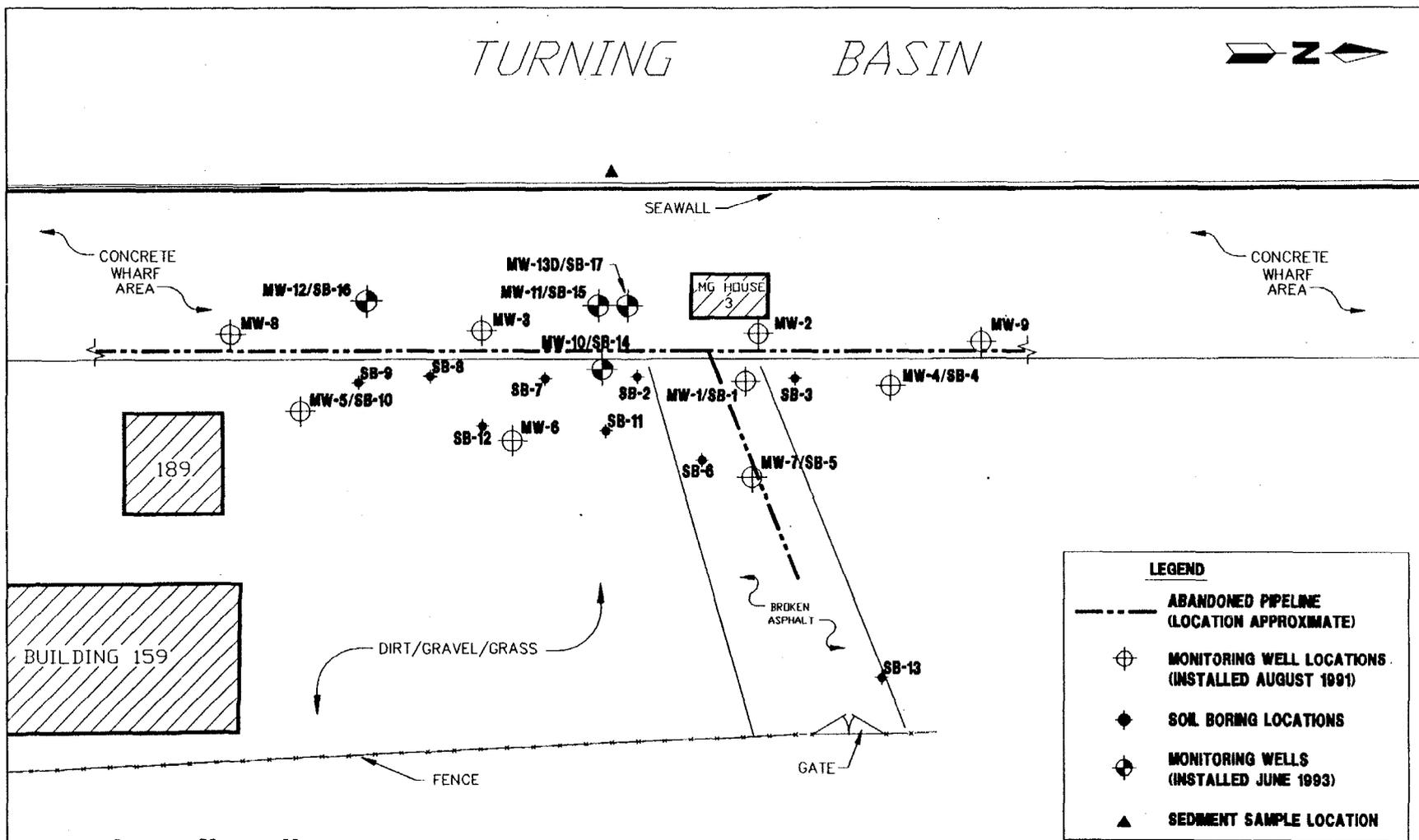
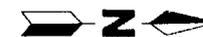
3.1.2 Monitoring Well Construction Three shallow monitoring wells, MW-10, MW-11, and MW-12, were installed in soil borings SB-14, SB-15, and SB-16, respectively (Figure 3-1). The previously drilled soil borings and installed monitoring wells are also shown in Figure 3-1.

Monitoring wells MW-10 through MW-12 were installed to a depth of 13 feet bls and are constructed of 2-inch inside diameter, schedule 40, polyvinyl chloride (PVC) casing with flush-threaded joints and 10 feet of 0.010-inch machine-slotted screen. The screen interval extends from 3 to 13 feet bls. PVC well casing extends from the top of the screen to land surface. A 20/30 grade silica sand filter pack was placed in the annular space to approximately 1 foot above the top of the screen. A 6- to 12-inch thick bentonite seal was placed on top of the filter pack. The remaining annular space was grouted to the surface with a neat cement grout, and a protective traffic-bearing vault was installed to complete the well. All monitoring wells are equipped with a locking well cap and a padlock. Monitoring well installation details are presented in Figure 3-2.

A vertical extent well (MW-13D) was installed in soil boring SB-17 to a depth of 35 feet bls (Figure 3-1). Monitoring well construction details for MW-13D are identical to those for monitoring wells MW-10 through MW-12, except that 5 feet of well screen were used, extending from 30 to 35 feet bls, and the 20/30 grade sand filter pack extended to approximately 2 feet above the top of the screened interval.

3.1.3 Water Table Elevation Measurements Groundwater elevations were recorded on March 27 and June 10, 1993. Top of casing, depth to groundwater, and groundwater elevations for March 27 and June 10, 1993, are summarized in Table 3-1. All elevations are relative to an arbitrary reference elevation established at the site. Depth to groundwater was measured using an electronic water level indicator. Water level elevations were calculated by subtracting the measured depth to groundwater from the elevation at the top of the well casing. Water level elevation contour maps for March 27 and June 10, 1993 were prepared using this information, and are presented in Figures 3-3 and 3-4, respectively.

TURNING BASIN

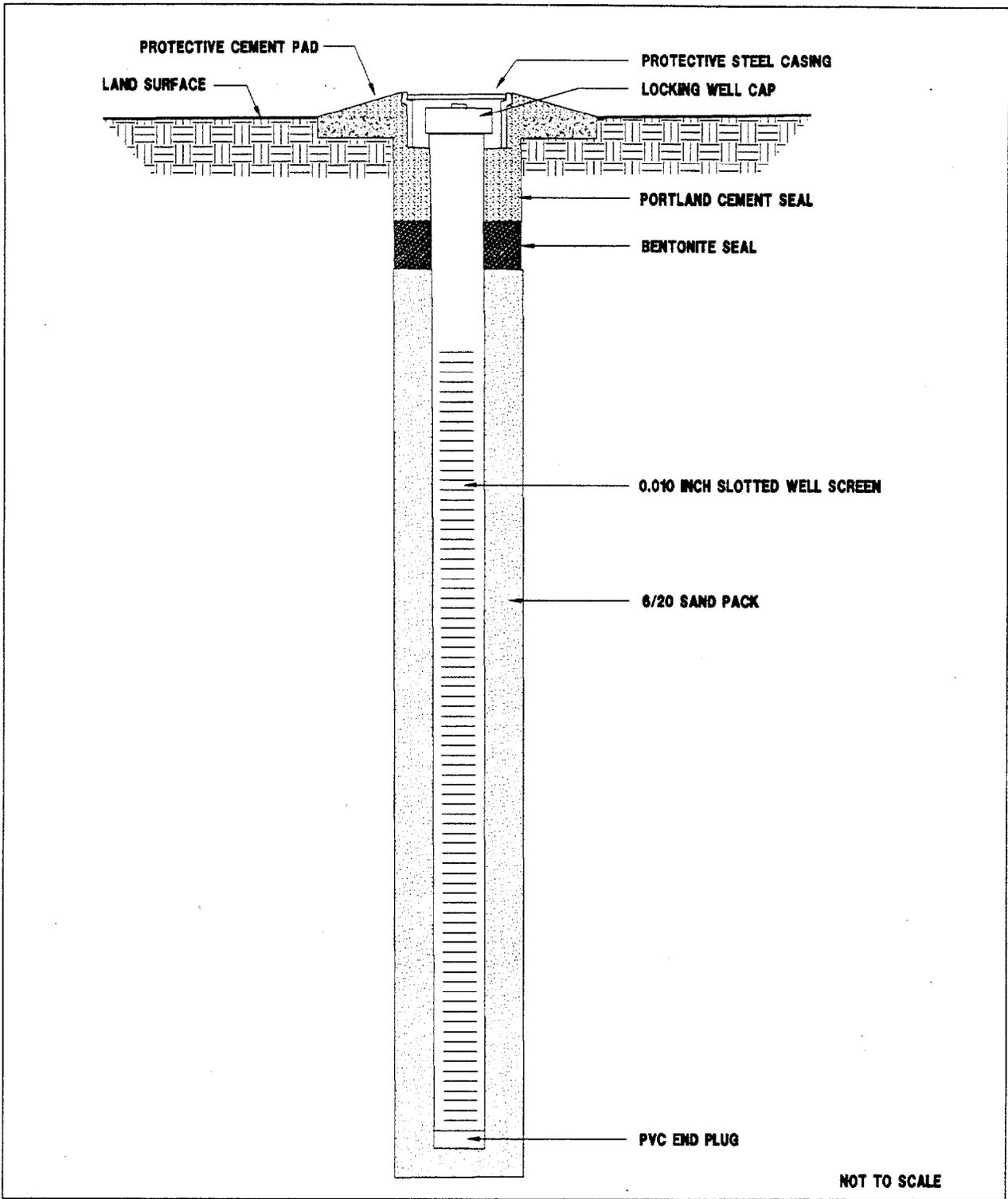


**FIGURE 3-1
SUPPLEMENTAL SOIL BORING,
MONITORING WELL, AND
SEDIMENT SAMPLE LOCATIONS**



**CONTAMINATION ASSESSMENT
REPORT ADDENDUM
SITE 189**

**TRUMAN ANNEX
NAVAL AIR STATION
KEY WEST, FLORIDA**



**FIGURE 3-2
MONITORING WELL INSTALLATION DETAIL**



**CONTAMINATION ASSESSMENT
REPORT ADDENDUM
SITE 189
TRUMAN ANNEX
NAVAL AIR STATION
KEY WEST, FLORIDA**

**Table 3-1
Top of Casing and Groundwater Elevations,
March 27 and June 10, 1993**

Contamination Assessment Report Addendum
Berthing Wharf
Building 189, Truman Annex
NAS Key West, Florida

Well Number	Top of Casing Elevation	March 27, 1993		June 10, 1993	
		Depth to Water (feet bls)	Groundwater Elevation ¹ (feet)	Depth to Water (feet bls)	Groundwater Elevation ¹ (feet)
MW-1	10.00	5.43	4.57	5.62	4.38
MW-2	10.74	6.30	4.44	6.44	4.30
MW-3	10.52	5.91	4.61	6.22	4.30
MW-4	10.91	6.21	4.70	6.26	4.65
MW-5	11.04	6.20	4.84	6.34	4.70
MW-6	9.74	5.00	4.74	5.18	4.56
MW-7	9.08	4.49	4.59	4.66	4.42
MW-8	10.62	5.94	4.68	6.13	4.49
MW-9	10.86	6.02	4.84	6.39	4.47
MW-10	10.22	NI	-	6.03	4.19
MW-11	10.45	NI	-	6.17	4.28
MW-12	10.57	NI	-	6.23	4.34
MW-13D	10.52	NI	-	6.37	4.15

¹ Top of casing and groundwater elevations relative to arbitrary site reference elevation.

Notes: bls = below land surface.

NI = well not installed at time of measurement.

- = no value.

TURNING BASIN

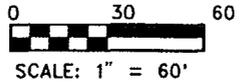
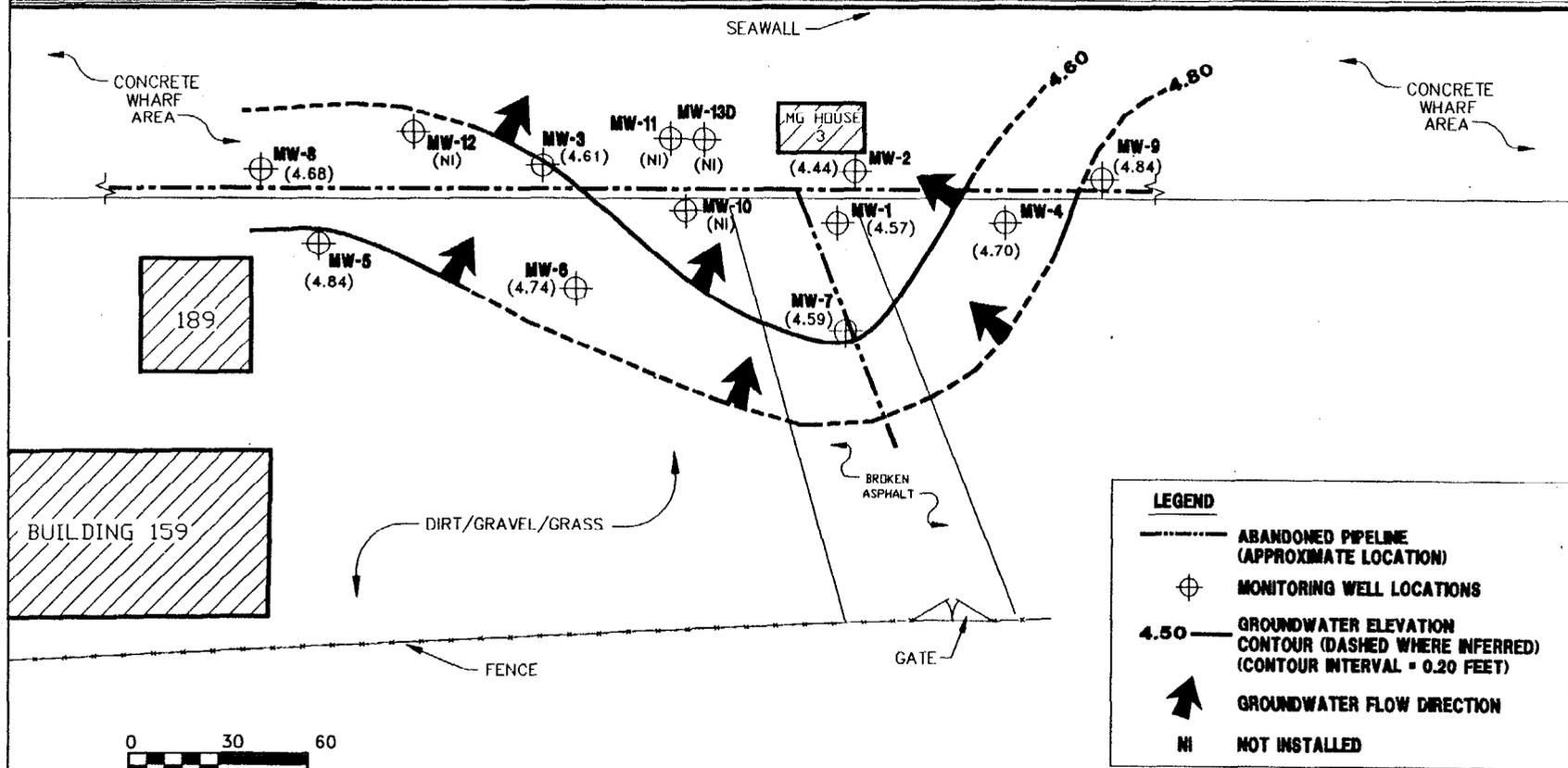


FIGURE 3-3
WATER TABLE ELEVATION CONTOUR MAP,
SURFICIAL ZONE, MARCH 27, 1993



CONTAMINATION ASSESSMENT
REPORT ADDENDUM
SITE 189

TRUMAN ANNEX
NAVAL AIR STATION
KEY WEST, FLORIDA

TURNING BASIN

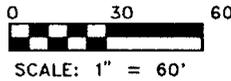
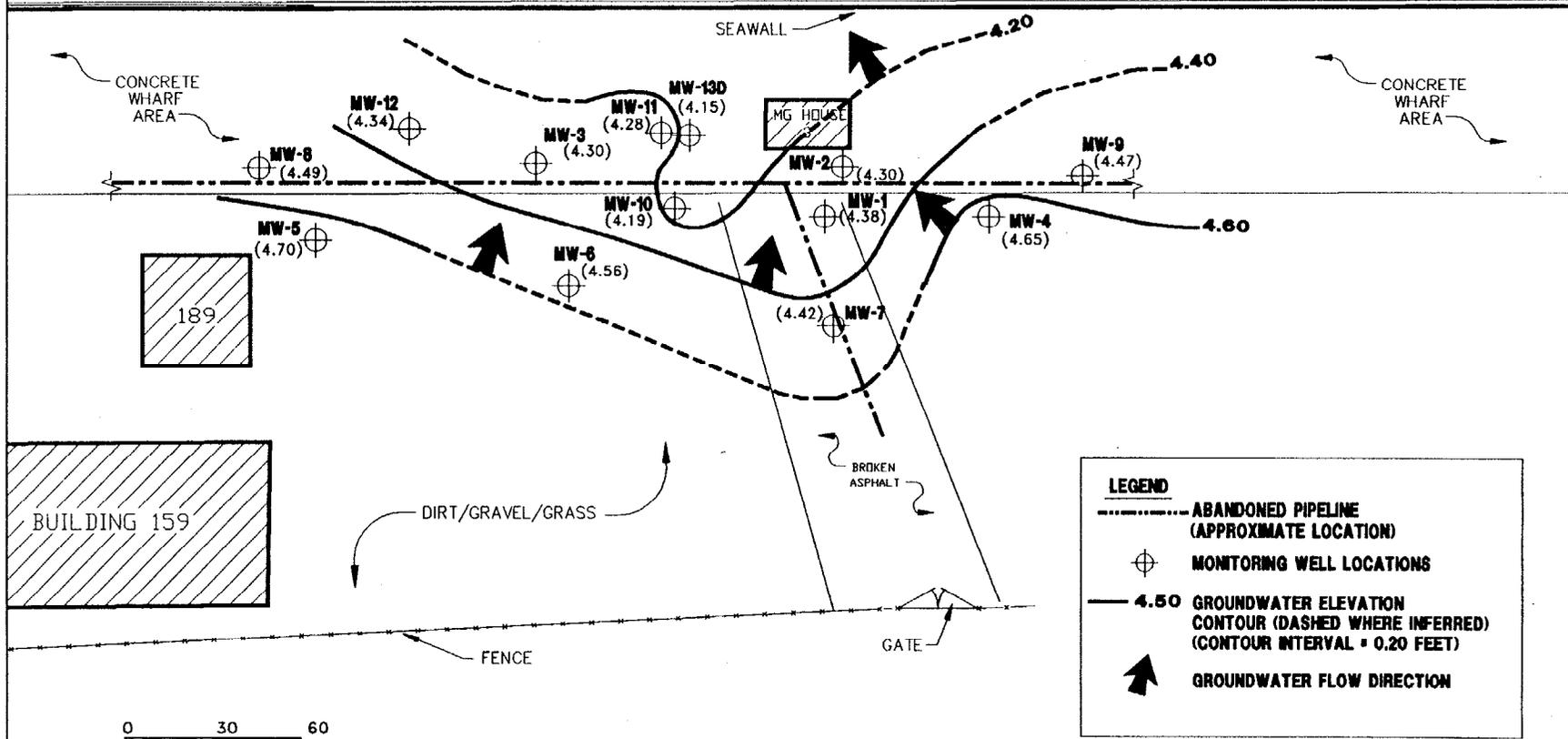


FIGURE 3-4
WATER TABLE ELEVATION
CONTOUR MAP SURFICIAL ZONE,
JUNE 10, 1993



CONTAMINATION ASSESSMENT
REPORT ADDENDUM
SITE 189

TRUMAN ANNEX
NAVAL AIR STATION
KEY WEST, FLORIDA

3.1.4 Groundwater Sampling and Analyses Groundwater samples were collected on June 8 and June 10, 1993. Groundwater analytical results are attached in Appendix B, Groundwater Analytical Data. Before sampling, each monitoring well was purged with a Teflon™ bailer until five well volumes had been removed. Groundwater samples were collected using an extruded Teflon™ bailer, placed into appropriate containers, preserved, placed on ice, and shipped to Wadsworth/ALERT Laboratories, Inc., in Tampa, Florida. The appropriate number of duplicate samples and equipment blanks was also collected.

Groundwater samples were collected from monitoring wells MW-1, and MW-4 through MW-9 on June 8, 1993, and were analyzed for TRPH only. A duplicate sample was collected from monitoring well MW-7 (designated as Duplicate 1 in Appendix B). Groundwater samples were collected from monitoring wells MW-2, MW-10, MW-11, MW-12, and MW-13D on June 10, 1993, and analyzed for TRPH and polynuclear aromatic hydrocarbons (PAHs) by USEPA Methods 418.1 and 610, respectively. A duplicate sample was collected from monitoring well MW-11 (designated Duplicate 2 in Appendix B). PAH analyses were performed to verify the presence of fluoranthene and pyrene detected in the sample collected March 27, 1993, from monitoring well MW-2 and to assess the horizontal and vertical extent of PAH contamination. Because of the presence of free product, monitoring well MW-3 was not sampled.

3.1.5 Sediment Sampling and Analysis A sediment sample was collected from the turning basin adjacent to the seawall approximately 50 feet west of soil boring SB-17 on June 10, 1993 (Figure 3-1). The depth of water in the turning basin where the sediment sample was collected is approximately 33 feet. The sediment sample was collected with a split-spoon sampling device that was lowered through the water. Once the floor of the turning basin was reached, the split spoon was advanced into the sediment to a depth of 2 feet below the turning basin floor and retrieved. The sample was placed in appropriate containers, packed on ice, and shipped overnight to Wadsworth/ALERT Laboratories, Inc., in Tampa, Florida. The sample was analyzed for volatile organic aromatics (VOAs) by USEPA Method 8240, for PAHs by USEPA Method 8270, for TRPH by USEPA Method 9073, and total metals analyses were performed for arsenic, cadmium, chromium, and lead. Sediment sample analytical results are attached in Appendix D, Laboratory Analytical Data for Sediment Sample Collected June 10, 1993. (Note that the sediment sample is designated as SB-18 [0 to 2 feet] in Appendix D.)

3.2 SOIL ASSESSMENT RESULTS. Results of the OVA headspace analyses for soil samples collected from soil borings SB-14 through SB-17 are tabulated in Table 3-2. No petroleum-contaminated soil was identified by OVA headspace analysis.

3.3 GROUNDWATER ASSESSMENT RESULTS.

3.3.1 Groundwater Flow Direction Water level data collected March 27 and June 10, 1993, indicate a westerly groundwater flow direction toward the turning basin (Figures 3-3 and 3-4, respectively). These water level data are consistent with measurements recorded in August 1991 (ABB-ES, 1992).

3.3.2 Groundwater Contamination, June 8 and June 10, 1993 The distribution of groundwater contaminants detected in samples collected June 8 and June 10, 1993, are presented in Figure 3-5. The only contaminants identified were TRPH and pyrene. Monitoring well MW-3 was not sampled because free product was observed

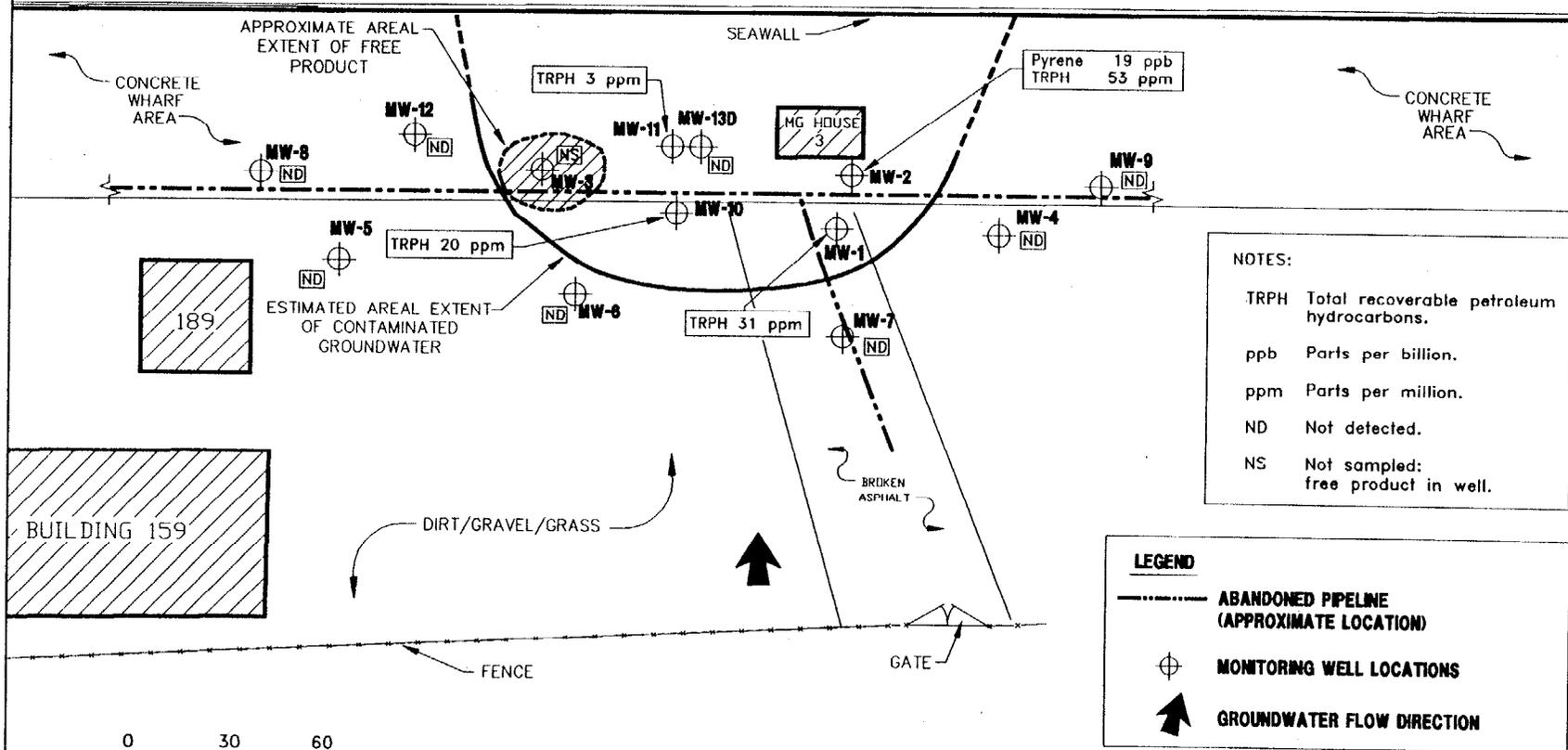
**Table 3-2
Summary of Organic Vapor Analyzer (OVA) Soil Sample Results,
June 7 Through June 10, 1993**

Contamination Assessment Report Addendum
Berthing Wharf
Building 189, Truman Annex
NAS Key West, Florida

Soil Boring Number	Depth Below Land Surface (feet)	OVA Headspace Reading (ppm)
SB-14	0 to 1	<1
	1 to 3	<1
SB-15	0 to 1	<1
	1 to 3	<1
	3 to 5	<1
SB-16	0 to 1	<1
	1 to 3	<1
	3 to 5	<1
SB-17	0.5 to 3	<1
	3 to 5	<1

Note: ppm = parts per million.

TURNING BASIN



NOTES:

TRPH Total recoverable petroleum hydrocarbons.

ppb Parts per billion.

ppm Parts per million.

ND Not detected.

NS Not sampled: free product in well.

LEGEND

--- ABANDONED PIPELINE (APPROXIMATE LOCATION)

⊕ MONITORING WELL LOCATIONS

➔ GROUNDWATER FLOW DIRECTION

**FIGURE 3-5
GROUNDWATER CONTAMINATION
DISTRIBUTION MAP,
JUNE 8 AND 10, 1993**



**CONTAMINATION ASSESSMENT
REPORT ADDENDUM
SITE 189**

**TRUMAN ANNEX
NAVAL AIR STATION
KEY WEST, FLORIDA**

in this well. The product observed in MW-3 was not a measurable quantity (less than 0.01-foot thick).

TRPH concentrations detected in the samples collected from monitoring wells MW-1, MW-2, MW-10, and MW-11, were 31 ppm, 53 ppm, 20 ppm, and 3 ppm, respectively. TRPH concentrations exceeded the State target level of 5 ppm for G-III groundwater in the samples collected from monitoring wells MW-1, MW-2, and MW-10. The areal extent of TRPH contamination is approximated by the bold line in Figure 3-5. This area is roughly centered around MG House 3. It is possible TRPH contamination may extend to the seawall although there are no data downgradient of MG House 3 to support this inference. Because of the high density of underground utilities, monitoring wells could not be drilled in the area west of MG House 3.

The PAH pyrene was detected in only the sample collected from monitoring well MW-2, at a concentration of 19 ppb. There is no State target cleanup level for pyrene for G-III groundwater; however, this concentration does not greatly exceed the State target level of 10 ppb for total PAH.

No contaminants were detected in the samples collected from monitoring wells MW-4 through MW-9, MW-12, and MW-13D.

3.3.3 Persistence of TRPH Contamination Comparison of TRPH concentrations in groundwater samples collected August 1991, March 1993, and June 1993 indicates a persistence of TRPH in monitoring wells MW-1 through MW-3. Comparative data are not available for the recently installed monitoring wells MW-10 through MW-13D in which TRPH were detected during the June 1993 sampling event. Comparative TRPH data for samples collected from monitoring wells MW-1 through MW-3 and MW-9 are summarized in Table 3-3. TRPH were not detected in samples collected from monitoring wells MW-4 through MW-8 during the course of this investigation.

TRPH concentrations in samples collected from monitoring well MW-1 in March and June 1993, were 57 ppm and 31 ppm, respectively. Monitoring well MW-1 was not sampled in August 1991 because free product was detected in the well. TRPH concentrations in samples collected from monitoring well MW-2 in August 1991, March 1993, and June 1993 were 8 ppm, 15 ppm, and 53 ppm, respectively. TRPH concentrations in samples collected from monitoring well MW-3 in August 1991 and March 1993 were 41 ppm and 300 ppm, respectively. Monitoring well MW-3 was not sampled in June 1993 because free product was observed in the well. Free product was also observed on the bailer when monitoring well MW-3 was sampled in March 1993, which accounts for the high TRPH concentration of 300 ppm.

TRPH concentrations in the samples collected from monitoring well MW-9 have decreased. TRPH were detected at a concentration of 2 ppm in August 1991; TRPH were not detected during the June 1993 sampling event.

3.3.4 Free Product Contamination Free product was detected in monitoring wells MW-1 and MW-3 during the CA. In August 1991, 0.05 foot of product was detected in monitoring well MW-1 (ABB-ES, 1992). Free product was not observed in monitoring well MW-1 during the March and June 1993 sampling events. Free product was not observed in monitoring well MW-3 during the August 1991 sampling event, but was observed in March and June 1993. The thickness of free product in monitoring well MW-3 was less than 0.01 foot.

Table 3-3
Comparison of Total Recoverable Petroleum Hydrocarbons (TRPH)
Groundwater Concentrations, August 1991 to June 1993

Contamination Assessment Report Addendum
 Berthing Wharf
 Building 189, Truman Annex
 NAS Key West, Florida

Well Identification	Concentrations Detected (ppm)		
	August 1991	March 1993	June 1993
MW-1	FP	57	31
MW-2	8	15	53
MW-3	41	300	FP
MW-9	2	NS	ND

¹ Free product observed in groundwater sample.

Notes: FP = free product observed in well, well not sampled.
 NS = not sampled.
 ND = not detected.
 ppb = parts per billion.

The free product is a thick, tarry substance, resembling Bunker C fuel oil. When observed in March and June 1993, the free product detected in monitoring well MW-3 did not form a continuous layer on top of the water column; rather, it occurred as small droplets approximately 0.02 to 0.1 inch in diameter at or near the top of the water column in the bailer.

Because free product was not observed in other monitoring wells during the June 1993 sampling event, the areal extent of free product contamination appears to be restricted to the vicinity of monitoring well MW-3. The presence of free product may have resulted from release(s) of Bunker C fuel oil from the former pipeline. Monitoring well MW-3 is located within 15 feet of the former pipeline location (Figure 3-5).

3.4 SEDIMENT SAMPLE RESULTS. Sediment sample analytical results are summarized in Table 3-4. Fifteen contaminants, including TRPH, were identified in the sediment sample. VOA concentrations were less than USEPA Method 8240 detection limits. Eleven PAH compounds were detected by USEPA Method 8270, at a combined concentration of 17.4 ppm. The concentration of TRPH was 51 ppm. Total metals concentrations for arsenic, chromium, and lead are 2.7 ppm, 17 ppm, and 38 ppm, respectively, which are below the metals standards for clean soil of 55 ppm, 275 ppm, and 77 ppm, respectively (FDER, May 1992). Concentrations of 10 tentatively identified compounds (TICs) detected in the sediment sample totaled 3.67 ppm. The TICs appear to be petroleum-related compounds.

The organic standard for clean soil is defined as soil having a TRPH concentration of less than 50 ppm and a PAH concentration of less than 6 ppm (Florida Department of Environmental Regulation [FDER], May 1992). The TRPH concentration of 51 ppm only slightly exceeds the clean soil standard, whereas the PAH concentration of 17.4 ppm is greater than the standard.

**Table 3-4
Summary of Sediment Sample Laboratory Analyses,
June 10, 1993**

Contamination Assessment Report Addendum
Berthing Wharf
Building 189, Truman Annex
NAS Key West, Florida

Compound	Concentration (ppm)	Tentatively Identified Compounds (TICs)	Concentration (ppm)
Anthracene	0.46	Bis(2-methoxyethyl)phthalate	0.35
Benzo(a)anthracene	1.7	Benzene, 1,3-dimethyl	0.86
Benzo(k)fluoranthene	2.9	4H-Cyclopenta[d,e,f]phenanthrene	0.38
Benzo(g,h,i)perylene	0.61	11H-Benzo[b]fluorene	0.29
Benzo(a)pyrene	1.4	Pyrene, 1-methyl	0.25
Chrysene	1.7	Benzonitrile, 4,4'-(1,2-ethenediyl)bis	0.16
Dibenzo(a,h)anthracene	0.41	Benzo[g,h,i]fluoranthene	0.16
Fluorene	3.2	Benzo[c]phenanthrene	0.13
Indeno(1,2,3-cd)pyrene	0.70	Benzo[e]pyrene	0.29
Phenanthrene	1.6	Perylene	0.80
Pyrene	2.7	Total TICs	3.67
Total PAH	17.4		
TRPH	51		
Arsenic	2.7		
Chromium	17		
Lead	38		

Notes: ppm = parts per million.
PAH = polynuclear aromatic hydrocarbons.
TRPH = total recoverable petroleum hydrocarbons.

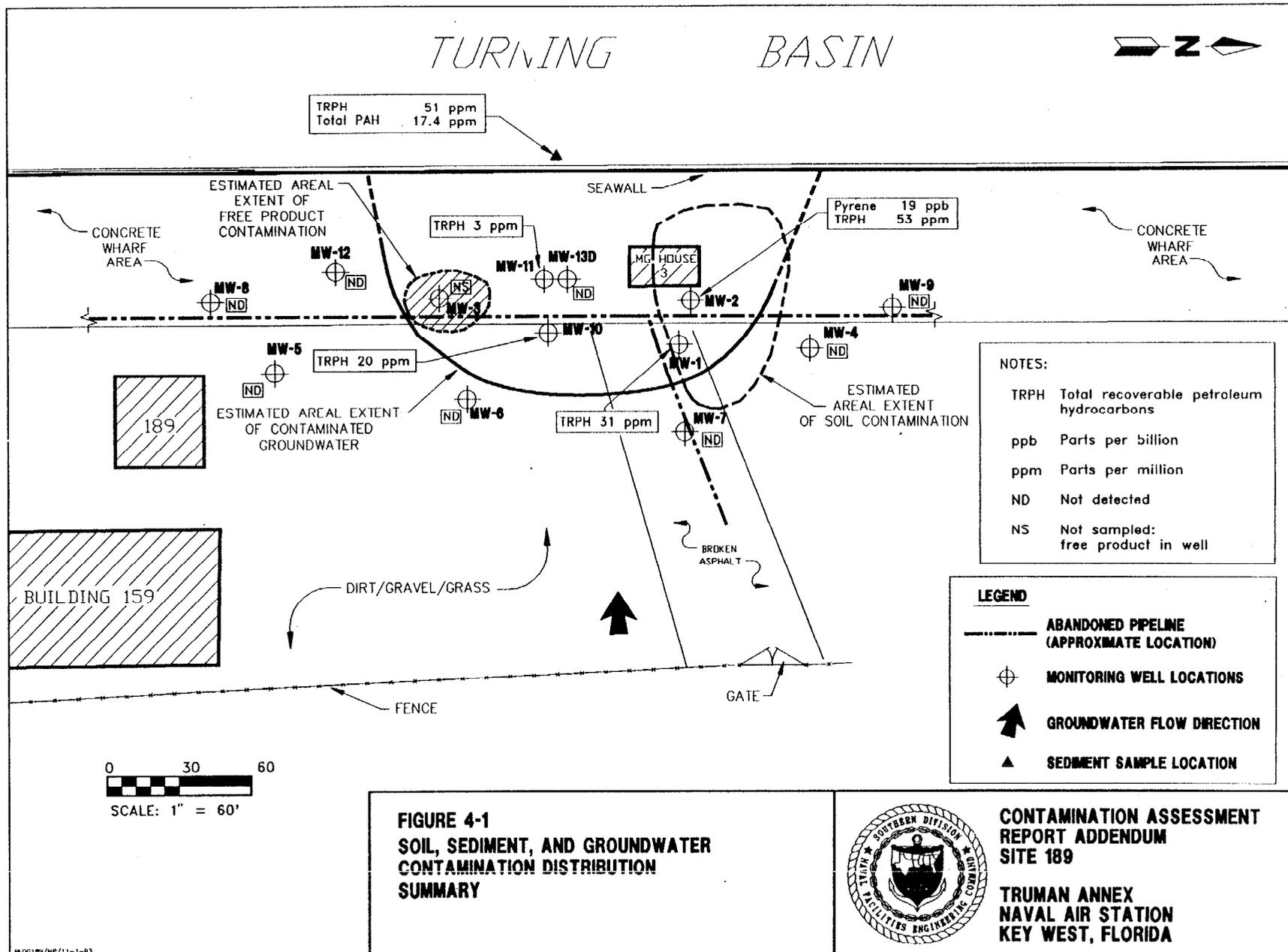
4.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

4.1 SUMMARY. Based on results of the August 1991 investigation and the additional field investigations conducted in March and June 1993, the following is a summary of the conditions at the Berthing Wharf near Building 189.

- The direction of groundwater flow is tidally influenced but is generally west toward the turning basin.
- The surficial aquifer in the Key West area is classified as a Class G-III groundwater source (McKenzie, 1990).
- Petroleum-contaminated soil was identified by OVA headspace analysis in the vicinity of monitoring well MW-2 (Figure 4-1). No excessively petroleum-contaminated soil was identified by OVA headspace analysis.
- Free product was observed in monitoring wells MW-1 and MW-3. Free product was observed in MW-3 during the March and June 1993 sampling event and in MW-1 only during the August 1991 sampling event. The free product is a thick, tarry substance that resembles Bunker C fuel.
- TRPH and pyrene were the only contaminants detected in groundwater samples collected in June 1993 (Figure 4-1). TRPH concentrations exceed the State target level of 5 ppm in samples collected from monitoring wells MW-1, MW-2, and MW-10. Pyrene was detected only in the sample collected from monitoring well MW-2, at a concentration of 19 ppb.
- TRPH contamination has been persistent in groundwater samples collected from monitoring wells MW-1 through MW-3.
- No contamination was detected in the sample collected from the vertical extent monitoring well MW-13D, which was screened from 30 to 35 feet bls.
- Petroleum contamination was identified in the sediment sample collected from the turning basin (Figure 4-1). TRPH and total PAH concentrations were 51 ppm and 17.4 ppm, respectively. These concentrations exceed the standard for clean soil (FDER, May 1992). Total metals concentrations were below State target levels.

4.2 CONCLUSIONS

- The source of soil and groundwater contaminants is most likely the abandoned Bunker C pipeline.
- The area of petroleum soil contamination appears to be restricted to the vicinity of MW-2.



- Free product and TRPH groundwater contamination are the primary concern at the site. Presently, the areal extent of free product contamination appears to be restricted to the vicinity of monitoring well MW-3, which is located within 10 feet of the abandoned Bunker C pipeline. The areal extent of TRPH groundwater contamination is roughly centered around MG House 3.
- The vertical extent of groundwater contamination is less than 30 feet bls in the vicinity of MG House 3. This indicates that groundwater contaminants are not migrating beneath the concrete seawall into the turning basin.
- The petroleum contamination detected in the turning basin sediment sample collected along the existing seawall may be the result of former naval activities in the turning basin. Sediment sample analyses from the Electric Power Plant site (Building 103), approximately 200 feet south of Site 189, indicate TRPH concentrations in turning basin sediments vary from 9 ppm to 97 ppm (ABB-ES, 1993) (Figure 4-2). The investigation at Building 103 indicated that high TRPH concentrations do not necessarily correspond with the direction of potential groundwater contaminant migration or to areas of soil contamination.

4.3 RECOMMENDATIONS. Because of the presence of free product in monitoring well MW-3 and the persistence of TRPH contamination in groundwater samples collected from monitoring wells MW-1 and MW-2, the following actions are recommended:

- free product remediation in the vicinity of monitoring well MW-3, and
- groundwater remediation in the vicinity of MG House 3, in particular near monitoring wells MW-1, MW-2, and MW-3.

The manner of free product and groundwater remediation will be presented in a remedial action plan (RAP), which will be developed pending approval of this CAR Addendum.

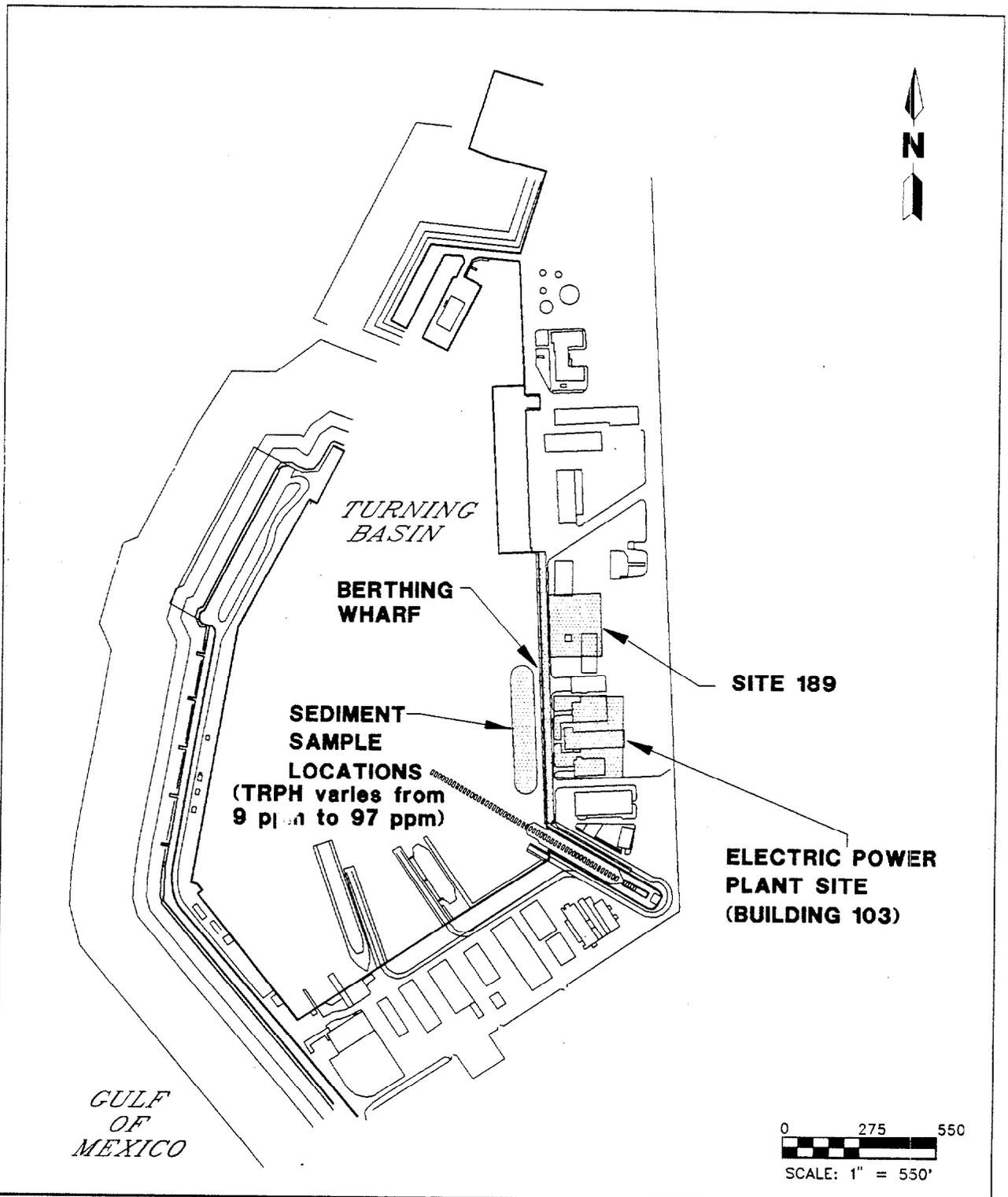


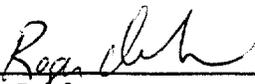
FIGURE 4-2
SEDIMENT SAMPLE LOCATIONS AT
ELECTRIC POWER PLANT SITE
(BUILDING 103)



CONTAMINATION ASSESSMENT
REPORT ADDENDUM
BUILDING 189
TRUMAN ANNEX
NAS WHITING FIELD
KEY WEST, FLORIDA

5.0 PROFESSIONAL REVIEW CERTIFICATION

The contamination assessment contained in this report was prepared using sound, hydrogeologic principles and judgment. This assessment is based on the geologic investigation and associated information detailed in the CAR and in the text and appended to this report. If conditions are determined to exist that differ from those described, the undersigned geologist should be notified to evaluate the effects of any additional information on the assessment described in this report. This Contamination Assessment Report Addendum was developed for the site near Building 189 at the Berthing Wharf, Truman Annex, Naval Air Station, Key West, Florida, and should not be construed to apply to any other site.



Roger Durham
Professional Geologist
P.G. No. 001127

11/22/93
Date

REFERENCES

- ABB Environmental Services, Inc., 1992, Contamination Assessment Report, Berthing Wharf Site (Building 189), Truman Annex, Naval Air Station, Key West, Florida: prepared for Southern Division, Naval Facilities Engineering Command, Charleston, South Carolina.
- ABB Environmental Services, Inc., 1993, Contamination Assessment Report Addendum, Electric Power Plant, Building 103, Truman Annex, Naval Air Station Key West, Key West, Florida: prepared for Southern Division, Naval Facilities Engineering Command, Charleston, South Carolina.
- Florida Department of Environmental Regulation, February 1989, Groundwater guidance concentrations: compiled by R. Merchant, Division of Water Facilities, 14 p.
- Florida Department of Environmental Regulation, May 1992, Guidelines for assessment and remediation of petroleum contaminated soils: Division of Waste Management, 39 p.
- McKenzie, D.J., 1990, Water resources potential of the freshwater lens at Key West, Florida: U.S. Geological Survey Water-Resources Investigations Report 90-4115, 24 p.

APPENDIX A

FDEP CORRESPONDENCE AND MEETING MINUTES



State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

For Routing to Other Than The Addressee	
By _____	Location _____
By _____	Location _____
By _____	Location _____
From _____	Date _____

Interoffice Memorandum

TO: Eric S. Nuzie, Federal Facilities Coordinator
Bureau of Waste Cleanup

THROUGH: Dr. James J. Crane, PGIII/Administrator *JJC*
Technical Review Section

FROM: Jorge R. Caspary P.G., Base Coordinator *J.R.C.*
Technical Review Section

DATE: April 22, 1992

SUBJECT: Meeting with ABB Environmental Services, Inc. on Contamination Assessment Reports for Base Exchange Station Bldg. A-322, PHMRON Maintenance Ramp Bldg. 352, Public Works Motor Pool Bldg. A-317, and Berthing Wharf Bldg. 189. Key West Naval Air Station

As agreed during an April 17th meeting with an ABB Environmental Services, Inc. representative, and followed by a confirmatory telephone conversation on April 21st, the following comments are issued on a site specific basis.

Base Exchange Service Station Bldg. A-322

As accorded with the ABB project manager, comments 1 and 2 of the March 30th interoffice memorandum are left as optional. However, it must be noted that if significant contaminant concentrations are detected at wells KYWA322- 9, 10, and 11, the previously asked water table monitoring wells will be required.

Comment 3 is rescinded. Only wells number 9, 10, and 12 will be required to be sampled and analyzed. Said wells should be analyzed for EPA Methods 624 and 625 for listed compounds. Non Priority Pollutants with peaks larger than 10 ppb should also be identified. In addition, a confirmatory analysis for Sulfur in groundwater should be implemented.

PHMRON Maintenance Ramp Bldg. 352

An additional well is needed downgradient of the underground storage tank. Well KYW352-1 is lateral to the groundwater flow.

Eric S. Nuzie
April 22, 1992
Page Two

PHMRON Maintenance Ramp Bldg. 352 - Cont'd

Concurrent with the above installation, sampling and analysis for EPA Methods 601, 602 and 610 should be conducted at all four wells.

Public Works Motor Pool Bldg. A-317

The comment is rescinded. A No-Further Action notice will be issued shortly.

Berthing Wharf Bldg. 189

As agreed during the meeting and telephone conversation, a Monitoring Only Plan is inappropriate for any site whose wells contain free product. Free-product should be recovered according to Section 17-770.300 (1) F.A.C. Manually bailing the Bunker C fuel oil is acceptable.

Wells KYW-189 -2 ,3, and 5 should be sampled and analyzed for EPA Methods 601, 602 610, and 418.1.

Well KYW-189-1 should have the groundwater below the free product line analyzed for Methods 601, 602, 610, and 418.1.



ASEA BROWN BOVERI MEMORANDUM

An ABB
Environmental
Services, Inc.

DATE: May 26, 1993

TO: Mr. Luis Vazquez
Code: 1843
Mr. Carl Loop
Code: 1847
Southern Division
NAVFACENGCOM

FROM: Jack Pittman
ABB-ES UST Department

PROJECTS: CTO 7, NAS Key West

SUBJECT: FDER Coordination Meeting

BACKGROUND: The analytical results of the latest supplemental field investigations conducted during the week of March 31, 1993 at NAS Key West CTO 7 sites indicated a need for further contamination plume delineation at Truman Annex Site 103, the Power Plant, and Site 189, the Berthing Wharf.

Field investigation results and approaches for completing investigations at both sites were evaluated at an ABB-ES/SouthDiv conference on May 19, 1993.

PURPOSE OF MEETING: To review the results of the field investigations at NAS Key West Sites 103 and 189 and approaches for plume delineation to obtain FDER comments on finalizing contamination assessments at these sites.

(In addition, at the request of FDER, an overview of NADEP, Pensacola Site 3810N was presented. The results of these discussions were provided in separate correspondence to Mr. Vazquez)

ATTENDEES:	FDER:	Tim Bahr	<u>SouthDiv</u>	Carl Loop
		Jorge Caspary		
		David Clowes	<u>ABB-ES</u>	K. Busen
		Michael Deliz		R. Durham
		Tim Larson		J. Pittman

DISCUSSIONS: Site 103. The March 31 field investigation delineated the horizontal boundaries of the 5 ppm TRPH contamination plume at Site 103. A deep well (MW-20D), screened between 27 and 32 feet was found to contain concentrations of 2 ppm of TRPH and 320 ppb of PAH and 408 ppb of total naphthalenes. (See Figure 1 attached). According to Navy drawings, the old sea wall, extends to a depth of 23 feet below land surface (bls) of the site. Groundwater contamination was found below the depth of the old sea wall indicating that the old sea wall may not form an effective barrier to contamination migration.

INTERNAL ABB-ES DISTRIBUTION:

R. May J. Williams K. Busen J. Kaiser R. Durham S. McDuffie

According to Navy drawings, the new sea wall that immediately abuts the Atlantic Ocean was constructed to a depth of 53 feet. ABB-ES has recommended that a second deep well be installed and screened to a depth interval of 50 to 55 feet to assess the potential for migration of contamination under the new sea wall to ocean waters. Because of the density of utilities between the old and new sea walls and the difficulty in locating them, the new deep well will most likely have to be installed on the landward side of the old sea wall.

ABB-ES will also collect sediment samples for analysis as close to the seaward side of the new sea wall as feasible.

FDER representatives had no significant comments on pursuing this approach.

Site 189. This site is adjacent to Site 103 and is similarly bounded by the old and new sea walls and the Atlantic Ocean. The results of groundwater analysis from the March 31, 1993 field investigation indicated an increase in TRPH concentrations to 300 ppm' in groundwater in MW KYW 189-3 on the western side of the site. (See Figure 2). MW KYW 189-1, located on the eastern side of the site, was found to contain free product during the initial field investigation; but no free product was found in this well during the March 31 field investigation. However, the results of groundwater analysis did indicate TRPH concentrations t 57 ppm.

ABB-ES is recommending the installation of one well to assess the vertical extent of the contamination and two additional shallow wells to assess the horizontal extent of contamination in the vicinity of MW KYW 189-3.

ABB-ES will also collect sediment samples for analysis as close to the seaward side of the new sea wall as feasible. FDER representatives stated that surface water samples were not needed at this site.

Mr. Loop raised the issue of remediation alternatives at Site 189 - considering the non-volatile nature of the contamination.

FDER representatives provided the following comments and requests for additional data for completing the contamination assessment and developing remediation alternatives at this site:

- ▶ Resample all site monitoring wells for TRPH.
- ▶ Collect samples for bioremediation.
- ▶ Consider removal of contaminated soils as part of remediation alternatives.

APPENDIX B
GROUNDWATER ANALYTICAL DATA

**LABORATORY ANALYTICAL DATA FOR
GROUNDWATER SAMPLES COLLECTED
MARCH 27, 1993**



WADSWORTH/ALERT Laboratories

Division of Precision Instruments

8910 Breckenridge Parkway, Suite 100
Tampa, FL 33619

TEL: 813/931-1314
FAX: 813/931-1312

ANALYTICAL REPORT

SUBCONTRACT NUMBER 1-08-134

TASK ORDER NUMBER: 0019

TRUMAN ANNEX-BLDG 189

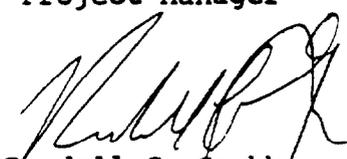
Presented to:

ROGER DURHAM

ABB ENVIRONMENTAL SERVICES, INC.

ENSECO-WADSWORTH/ALERT LABORATORIES


Joanne Anderson
Project Manager


Randall C. Grubbs
Laboratory Director - Florida

April 21, 1993



ENSECO-WADSWORTH/ALERT
Laboratories

INVOLVEMENT

This report summarizes the analytical results of the Truman Annex-Bldg 189 site submitted by ABB Environmental Services, Inc. to Enseco-Wadsworth/ALERT Laboratories who provided independent, analytical services for this project under the direction of Roger Durham. The samples were accepted into Wadsworth's Florida facility on 30 March 1993, in accordance with documented sample acceptance procedures. The associated analytical methods and sample results are outlined sequentially in this report.

Analytical results included in this report have been reviewed for compliance with the Laboratory QA/QC Plan as summarized in the Quality Control Section at the rear of the report. Sample custody documentation describing the number of samples and sample matrices is also included. Any qualifications and/or non-compliant items have been noted below.



ENSECO-WADSWORTH/ALERT
Laboratories

ANALYTICAL METHODS

Wadsworth/ALERT Laboratories utilizes only USEPA approved analytical methods and instrumentation. The analytical methods utilized for the analysis of these samples are listed below.

PARAMETER	METHOD
ORGANICS	
Volatile Organics	** EPA Method 601/2
Polynuclear Aromatic Hydrocarbons	** EPA Method 625
MISCELLANEOUS	
Tot. Rec. Petroleum Hydrocarbons	** EPA Method 418.1

NOTE: ** Indicates usage of this method to obtain results for this report.

(D) Indicates draft version of this method was used

EPA Methods Methods for Chemical Analysis of Water and Wastes, USEPA, 600/4-79-020, March, 1983. July, 1982

Std. Methods Drinking Waters USEPA, 600/4-88/039, December, 1988.

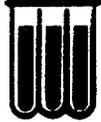
USEPA Methods Standard Methods for the Examination of Water and Waste-water, APHA, 16th edition, 1985.

SW846 Methods From 40CFR Part 136, published in Federal Register on October 26, 1984.

ASTM Methods Test Methods for Evaluating Solid Waste Physical/Chemical Methods, 3rd Edition, USEPA, 1986.

NIOSH Method American Society for Testing and Materials.

NIOSH Manual of Analytical Methods, National Institute for Occupational Safety and Health, 2nd Edition, April 1977.



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 3C3010-1
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/7/93

SAMPLE ID: KYW-189-MW1

KEY WEST-CTO 7

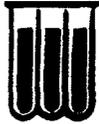
CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 601/602 - GC

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	95	(78-122)
Trifluorotoluene (PID)	98	(73-131)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3010-1
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: 3/31/93
DATE ANALYZED: 4/20/93

SAMPLE ID: KYW-189-MW1

KEY WEST-CTO 7

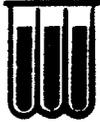
POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

CERTIFICATION #: E84059
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3-cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	86	(22-135)	(10-155)
Fluorobiphenyl	62	(34-140)	(12-153)
Terphenyl-d14	20	(10-132)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 3C3010-1
MATRIX : WATER

DATE RECEIVED: 3/30/93

SAMPLE ID : KYW-189-MW1

KEY WEST-CTO 7

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	4/13/93	57	50	mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 3C3010-2
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/7/93

SAMPLE ID: KYW-189-MW2

KEY WEST-CTO 7

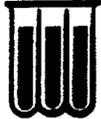
VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = 1 ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	94	(78-122)
Trifluorotoluene (PID)	100	(73-131)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3010-2 -
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: 3/31/93
DATE ANALYZED: 4/20/93

SAMPLE ID: KYW-189-MW2

KEY WEST-CTO 7

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

CERTIFICATION #: E84059
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	1
Fluorene	ND
Indeno (1, 2, 3-cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	41

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	113	(22-135)	(10-155)
Fluorobiphenyl	83	(34-140)	(12-153)
Terphenyl-d14	32	(10-132)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 3C3010-2 -
MATRIX : WATER

DATE RECEIVED: 3/30/93

SAMPLE ID : KYW-189-MW2

KEY WEST-CTO 7

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	4/13/93	11	5	mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 3C3010-3
MATRIX: WATER

DATE RECEIVED: 3/3/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/7/93

SAMPLE ID: KYW-189-MW3

KEY WEST-CTO 7

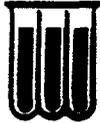
CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 601/602 - GC

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = 1 ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	102	(78-122)
Trifluorotoluene (PID)	100	(73-131)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3010-3
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: 3/31/93
DATE ANALYZED: 4/20/93

SAMPLE ID: KYW-189-MW3

KEY WEST-CTO 7

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

CERTIFICATION #: E84059
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3-cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	88	(22-135)	(10-155)
Fluorobiphenyl	71	(34-140)	(12-153)
Terphenyl-d14	19	(10-132)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 3C3010-3
MATRIX : WATER

DATE RECEIVED: 3/30/93

SAMPLE ID : KYW-189-MW3

KEY WEST-CTO 7

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	4/13/93	300	50	mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 3C3010-4
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/7/93

SAMPLE ID: KYW-189-MW5

KEY WEST-CTO 7

VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	98	(78-122)
Trifluorotoluene (PID)	101	(73-131)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3010-4
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: 3/31/93
DATE ANALYZED: 4/20/93

SAMPLE ID: KYW-189-MW5

KEY WEST-CTO 7

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

CERTIFICATION #: E84059
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3-cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	98	(22-135)	(10-155)
Fluorobiphenyl	79	(34-140)	(12-153)
Terphenyl-d14	30	(10-132)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3010-4
MATRIX : WATER

DATE RECEIVED: 3/30/93

SAMPLE ID : KYW-189-MW5

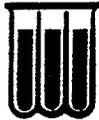
KEY WEST-CTO 7

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Tot Recoverable Pet Hydrocarbons	4/13/93	ND	1 mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 3C3010-5
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/7/93

SAMPLE ID: KYW-189-DUP

KEY WEST-CTO 7

VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = 1 ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY: %
 Bromochloromethane (HECD) 102
 Trifluorotoluene (PID) 99

ACCEPTABLE LIMITS
 (78-122)
 (73-131)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3010-5 -
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: 3/31/93
DATE ANALYZED: 4/20/93

SAMPLE ID: KYW-189-DUP

KEY WEST-CTO 7

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

CERTIFICATION #: E84059
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3-cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	27

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	66	(22-135)	(10-155)
Fluorobiphenyl	64	(34-140)	(12-153)
Terphenyl-d14	25	(10-132)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 3C3010-5
MATRIX : WATER

DATE RECEIVED: 3/30/93

SAMPLE ID : KYW-189-DUP

KEY WEST-CTO 7

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	4/13/93	15	5	mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 3C3010-6
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/7/93

SAMPLE ID: KYW-189-EB

KEY WEST-CTO 7

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 601/602 - GC

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	1
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = 1 ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	100	(78-122)
Trifluorotoluene (PID)	99	(73-131)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3010-6
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: 3/31/93
DATE ANALYZED: 4/20/93

SAMPLE ID: KYW-189-EB

KEY WEST-CTO 7

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

CERTIFICATION #: E84059
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3-cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	110	(22-135)	(10-155)
Fluorobiphenyl	82	(34-140)	(12-153)
Terphenyl-d14	82	(10-132)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 3C3010-6
MATRIX : WATER

DATE RECEIVED: 3/30/93

SAMPLE ID : KYW-189-EB

KEY WEST-CTO 7

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	4/13/93	ND	1	mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 3C3010-10
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/ 9/93

SAMPLE ID: TRIP BLANK

VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	118	(78-122)
Trifluorotoluene (PID)	105	(73-131)



ENSECO-WADSWORTH/ALERT
Laboratories

QUALITY CONTROL SECTION

- Quality Control Summary
- Laboratory Blanks
- Laboratory Control Sample
- Matrix Spike/Matrix Spike Duplicate Results
- Sample Custody Documentation



QUALITY ASSURANCE / QUALITY CONTROL
PROGRAM SUMMARY

Wadsworth/ALERT Laboratories considers continuous analytical method performance evaluations to be an integral portion of the data package, and routinely includes the pertinent QA/QC data associated with various analytical result reports. Brief discussions of the various QA/QC procedures utilized to measure acceptable method and matrix performance follow.

Surrogate Spike Recovery Evaluations

Known concentrations of designated surrogate spikes, consisting of a number of similar, non-method compounds or method compound analogues, are added, as appropriate, to routine GC and GC/MS sample fractions prior to extraction and analysis. The percent recovery determinations calculated from the subsequent analysis is an indication of the overall method efficiency for the individual sample. This surrogate spike recovery data is displayed alongside acceptable analytical method performance limits at the bottom of each applicable analytical result report sheet.

NOTE: Acceptable method performance for Base/Neutral Acid extractables is indicated by two (2) of three (3) surrogates for each fraction with a minimum recovery of ten (10) percent each. For Pesticides one (1) of two (2) surrogates meeting performance criteria is acceptable.

Laboratory Analytical Method Blank Evaluations

Laboratory analytical method blanks are systematically prepared and analyzed in order to continuously evaluate the system interferences and background contamination levels associated with each analytical method. These method blanks include all aspects of actual laboratory method analysis (chemical reagents, glassware, etc.), substituting laboratory reagent water or solid for actual sample. The method blank must not contain any analytes above the reported detection limit. The following common laboratory contaminants are exceptions to this rule provided they are not present at greater than five times the detection limit.

<u>Volatiles</u>	<u>Semi-volatiles</u>	<u>Metals</u>
Methylene chloride	Dimethyl phthalate	Calcium
Toluene	Diethyl phthalate	Magnesium
2-Butanone	Di-n-butyl phthalate	Sodium
Acetone	Butyl benzyl phthalate	
	Bis (2-ethylhexyl) phthalate	

A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method blanks.

Laboratory Analytical Method Check Sample Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to a laboratory reagent blank prior to extraction and analysis. Percent recovery determinations demonstrate the performance of the analytical method. Failure of a check sample to meet established laboratory recovery criteria is cause to stop the analysis until the problem is resolved.



ENSECO-WADSWORTH/ALERT
Laboratories

QUALITY ASSURANCE / QUALITY CONTROL
PROGRAM SUMMARY
(cont'd)

At that time all associated samples must be re-analyzed. A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method check samples.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) Recovery Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to two of three separate aliquots of a sequentially predetermined sample prior to extraction and analysis. Percent recovery determinations are calculated from both of the spiked samples by comparison to the actual values generated from the unspiked sample. These percent recovery determinations indicate the accuracy of the analysis at recovering actual analytical method compounds from the matrix. Relative percent difference determinations calculated from a comparison of the MS/MSD recoveries demonstrate the precision of the analytical method. Actual percent recovery and relative percent difference data is displayed alongside their respective acceptable analytical method performance limits in the QA/QC section of the report. The MS/MSD are considered in control when the precision is within established control limits and the associated check sample has been found to be acceptable. A minimum of ten percent (10%) of all analyses are MS/MSD quality control samples.

*****EXAMPLE*****

COMPOUND	SAMPLE CONC.	MS %REC	MSD %REC	RPD	RPD	QC LIMITS RECOVERY
4,4'-DDT	0	95	112	16	22	66-119
Benzene	10	86	93	8	20	39-150
(cmpd. name)	sample result	1st% recov.	2nd% recov.	Rel.% diff.		accep. method perform range

Analytical Result Qualifiers

The following qualifiers, as defined below, may be appended to analytical results in order to allow proper interpretation of the results presented:

J - indicates an estimated concentration (typically used when a dilution, matrix interference or instrumental limitation prevents accurate quantitation of a particular analyte).

B - indicates the presence of a particular analyte in the laboratory blank analyzed concurrently with the samples. Results must be interpreted accordingly.

DIL - indicates that because of matrix interferences and/or high analyte concentrations, it was necessary to dilute the sample to a point where the surrogate or spike concentrations fell below a quantifiable amount and could not be reported.



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 3C3010-BK
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/6/93

SAMPLE ID: LABORATORY BLANK

VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	87	(78-122)
Trifluorotoluene (PID)	99	(73-131)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 3C3010-BK
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/ 9/93

SAMPLE ID: LABORATORY BLANK

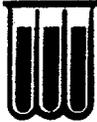
VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = 1 ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	105	(78-122)
Trifluorotoluene (PID)	104	(73-131)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3010-BK
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: 3/31/93
DATE ANALYZED: 4/14/93

SAMPLE ID: LABORATORY BLANK

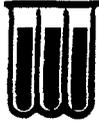
POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

CERTIFICATION #: E84059
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3-cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	123	(22-135)	(10-155)
Fluorobiphenyl	89	(34-140)	(12-153)
Terphenyl-d14	88	(10-132)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 3C3010-BK
MATRIX : WATER

DATE RECEIVED: 3/30/93

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Tot Recoverable Pet Hydrocarbons	4/13/93	ND	1 mg/l

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS
MATRIX : WATER
METHOD : 601/2
RUN ID : SA/SB00843

DATE EXTRACTED: N/A
DATE ANALYZED : 04/06/93

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS	
			RPD	%REC
Benzene	SA/SB00843	111	15	70-117
Toluene		112	16	70-117
Chlorobenzene		108	24	58-133
1,1-Dichloroethene		115	28	43-131
Trichloroethene		114	30	69-129
Dichlorobromomethane		119	22	61-133



ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS
MATRIX : WATER
METHOD : 601/2
RUN ID : MA/MB01094

DATE EXTRACTED: N/A
DATE ANALYZED : 04/09/93

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS	
			RPD	%REC
Benzene	MA/MB01094	116	15	70-117
Toluene		111	16	70-117
Chlorobenzene		109	24	58-133
1,1-Dichloroethene		84	28	43-131
Trichloroethene		107	30	69-129
Dichlorobromomethane		67	22	61-133



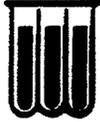
ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS
MATRIX : WATER
METHOD : 625
RUN ID : D0275

DATE EXTRACTED: 03/31/93
DATE ANALYZED : 04/14/93

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS	QC LIMITS	
		%REC	RPD	%REC
Naphthalene	D0275	89	43	10-139
1-Methylnaphthalene		84	48	10-150
Acenaphthene		88	29	45-130
Fluorene		91	24	37-133
Pyrene		109	41	20-144
Chrysene		86	45	15-152



ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS

MATRIX : WATER

LABORATORY CONTROL SAMPLE RESULTS
WET CHEMISTRY

PARAMETER	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
TRPH (IR)	04/13/93	04/13/93	86	24 75-124	LCS



ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : 3C3010-4
MATRIX : WATER
METHOD : 601/2
RUN ID : SA/SB00857/00858

DATE RECEIVED : 03/30/93
DATE PREPARED : N/A
DATE ANALYZED : 04/07/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC
Benzene	SA/SB00857/00858	112	112	0	16 76-126
Toluene		114	132	15	23 75-122
Chlorobenzene		110	126	14	13 74-113
1,1-Dichloroethene		104	112	7	19 63-123
Trichloroethene		104	100	4	10 75-115
Dichlorobromomethane		122	117	4	15 67-114

* = Diluted Out



ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : 3C3010-1
MATRIX : WATER
METHOD : 625
RUN ID : D0512/D0513

DATE RECEIVED : 03/30/93
DATE PREPARED : 03/31/93
DATE ANALYZED : 04/20/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS	MSD	RPD	QC LIMITS	
		%REC	%REC		RPD	%REC
Naphthalene	D0512/D0513	68	68	0	23	25-97
1-Methylnaphthalene		66	64	3	24	48-101
Acenaphthene		65	65	0	24	57-104
Fluorene		66	62	6	28	34-118
Pyrene		57	56	2	30	58-148
Chrysene		56	54	4	36	48-118

* = Diluted Out

**ENSECO-WADSWORTH/ALERT LABORATORIES
SAMPLE SHIPPER EVALUATION AND RECEIPT FORM**

Client: ABB Project Name/Number: Edg 103 / Edg 352 / Edg A-3
 Samples Received By: [Signature] / WAD Date Received: 3-30-93
 Sample Evaluation Form By: Carol Mc Nulty LAB No: 6060/30.3010
 (Signature)

Type of shipping container samples received in? WAL Cooler X
 Client Cooler WAL Shipper Box Other

Any "NO" responses or discrepancies should be explained in comments section.

	YES	NO
1. Were custody seals on shipping container(s) intact?	<u>X</u>	<u> </u>
2. Were custody papers properly included with samples?	<u>X</u>	<u> </u>
3. Were custody papers properly filled out (ink, signed, match labels)?	<u>X</u>	<u> </u>
4. Did all bottles arrive in good condition (unbroken)?	<u>X</u> *see below	<u> </u>
5. Were all bottle labels complete (Sample No., date, signed, analysis preservatives)?	<u>X</u>	<u> </u>
6. Were correct bottles used for the tests indicated?	<u>X</u>	<u> </u>
7. Were proper sample preservation techniques indicated?	<u>X</u>	<u> </u>
8. Were samples received within adequate holding time?	<u>X</u>	<u> </u>
9. Were all VOA bottles checked for the presence of air bubbles? (If air bubbles were found indicate in comment section)	<u>X</u>	<u> </u>
10. Were samples in direct contact with wet ice? (NOTE TEMPERATURE BELOW)	<u>X</u>	<u> </u>
11. Were samples accepted into the laboratory? (If no see comments) #86 <u>6</u> #82 <u>10</u> °C #288 <u>8</u>	<u>X</u>	<u> </u>
Cooler # <u>322</u> Temp <u>8</u> °C	Cooler # <u>501</u> Temp <u>6</u> °C	#301 <u>1</u>
Cooler # <u>59</u> Temp <u>8</u> °C	Cooler # <u>90</u> Temp <u>6</u> °C	#323 <u>1</u>
* <u>103</u> <u>5</u> °C	* <u>101</u> <u>5</u> °C	
Comments: <u>*92 4 °C</u>	<u>*222 10 °C</u>	

* Metals Bottle for A322 - Dup Rec'd w/ lid off + turned over in cooler - No Sample
 note - Rec'd 1 Seal Sample for KYW-103-S1 CoC serial 3126193 to 8276, RCR4, TR1



**WADSWORTH/ALERT
LABORATORIES**
Sampling, testing, mobile labs

5910 Breckenridge Pkwy.
Suite H
Tampa, FL 33610

Chain of Custody Record

(813) 621-0784
Fax (813) 623-6021

Record 1 of 1
10560

Client: <u>ABB-ES</u>		Project Name / Location: <u>Truman Annex - Bldg 189</u>			No. Of CON-TAINERS	Parameter										Remarks
Sampler(s): <u>R. D. ...</u>		Project #: <u>Key West-CTO 7</u>				VOC - <u>60/6022</u>	PAH - <u>Le10</u>	METALS -	TRIPH -	EDB -						
Item #	Date	Time	MATRIX	Sample Location												
1	3-27-13	16:25	H ₂ O	KYW-189-MW2	6	3	2		1							
2		16:25		KYW-189-MW5	6	3	2		1							
3		16:45		KYW-189-MW3	6	3	2		1							
4		17:30		KYW-189-MW1	6	3	2		1							
5				KYW-189-DUP	6	3	2		1							
6	3-27-13	16:00		KYW-189-EB	6	3	2		1							
7																
8																
9																
10																
11																

Total Containers **36** Number of Coolers in Shipment Bailers

Report To:	Transfer Number	Item Number(s)	Relinquished By / Company	Accepted By / Company	Date	Time
Additional Comments: <u>No Vials</u> <u>...</u>	1		<u>ABB-ES</u>	<u>[Signature]</u> / <u>WAD</u>	<u>3-30-13</u>	<u>18</u>
	2					
	3					
	4					
	5					
	6					

Original Accompanies Shipment

**LABORATORY ANALYTICAL DATA FOR
GROUNDWATER SAMPLES COLLECTED
JUNE 8, 1993**



ENSECO-WADSWORTH/ALERT Laboratories
Division of Corning Lab Services, Inc.

5910 Breckenridge Parkway, Suite H 813-621-0784
Tampa, FL 33610 FAX 813-623-6021

ANALYTICAL REPORT

SUBCONTRACT NUMBER: SE1-08-134

TASK ORDER NUMBER: 35

NAS KEY WEST BLDG 189

Presented to:

ROGER DURHAM

ABB ENVIRONMENTAL SERVICES, INC.

ENSECO-WADSWORTH/ALERT LABORATORIES

5910 BRECKENRIDGE PARKWAY, SUITE H

TAMPA, FLORIDA 33610

(813) 621-0784

Joanne Anderson
Joanne Anderson
Project Manager

Randall C. Grubbs
Randall C. Grubbs
Laboratory Director - Florida

June 23, 1993

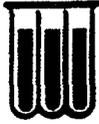


ENSECO-WADSWORTH/ALERT
Laboratories

INVOLVEMENT

This report summarizes the analytical results of the NAS Key West Bldg 189 site submitted by ABB Environmental Services, Inc. to Enseco-Wadsworth/ALERT Laboratories who provided independent, analytical services for this project under the direction of Roger Durham. The samples were accepted into Wadsworth's Florida facility on 09 June 1993, in accordance with documented sample acceptance procedures. The associated analytical methods and sample results are outlined sequentially in this report.

Analytical results included in this report have been reviewed for compliance with the Laboratory QA/QC Plan as summarized in the Quality Control Section at the rear of the report. Sample custody documentation describing the number of samples and sample matrices is also included. Any qualifications and/or non-compliant items have been noted below.



ENSECO-WADSWORTH/ALERT
Laboratories

ANALYTICAL METHODS

Wadsworth/ALERT Laboratories utilizes only USEPA approved analytical methods and instrumentation. The analytical methods utilized for the analysis of these samples are listed below.

PARAMETER

METHOD

MISCELLANEOUS

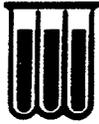
Tot. Rec. Petroleum Hydrocarbons

** EPA Method 418.1

NOTE:

** Indicates usage of this method to obtain results for this report.

(D) Indicates draft version of this method was used
EPA Methods Methods for Chemical Analysis of Water and Wastes, USEPA, 600/4-79-020, March, 1983. July, 1982
Std. Methods Drinking Waters USEPA, 600/4-88/039, December, 1988.
Standard Methods for the Examination of Water and Waste-water, APHA, 16th edition, 1985.
USEPA Methods From 40CFR Part 136, published in Federal Register on October 26, 1984.
SW846 Methods Test Methods for Evaluating Solid Waste Physical/Chemical Methods, 3rd Edition, USEPA, 1986.
ASTM Methods American Society for Testing and Materials.
NIOSH Method NIOSH Manual of Analytical Methods, National Institute for Occupational Safety and Health, 2nd Edition, April 1977.



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0901-1
MATRIX : WATER

DATE RECEIVED: 6/ 9/93

SAMPLE ID : MW 1 NAS KEY WEST BLDG 189

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	6/15- 6/16/93	31	10	mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0901-2
MATRIX : WATER

DATE RECEIVED: 6/ 9/93

SAMPLE ID : MW 4 NAS KEY WEST BLDG 189

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	6/15- 6/16/93	ND	1	mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 3F0901-3
MATRIX : WATER

DATE RECEIVED: 6/ 9,

SAMPLE ID : MW 5 NAS KEY WEST BLDG 189

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Tot Recoverable Pet Hydrocarbons	6/15- 6/16/93	ND	1 mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0901-4
MATRIX : WATER

DATE RECEIVED: 6/ 9/93

SAMPLE ID : MW 6 NAS KEY WEST BLDG 189

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	6/15- 6/16/93	ND	1	mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0901-5
MATRIX : WATER

DATE RECEIVED: 6/ 9/.

SAMPLE ID : MW 7 NAS KEY WEST BLDG 189

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	6/15- 6/16/93	ND	1	mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 3F0901-6
MATRIX : WATER

DATE RECEIVED: 6/ 9/93

SAMPLE ID : MW 8 NAS KEY WEST BLDG 189

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Tot Recoverable Pet Hydrocarbons	6/15- 6/16/93	ND	1 mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0901-7
MATRIX : WATER

DATE RECEIVED: 6/ 9/

SAMPLE ID : MW 9 NAS KEY WEST BLDG 189

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	6/15- 6/16/93	ND	1	mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 3F0901-8
MATRIX : WATER

DATE RECEIVED: 6/ 9/93

SAMPLE ID : DUPLICATE 1 NAS KEY WEST BLDG 189

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	6/15- 6/16/93	ND	1	mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 3F0901-9
MATRIX : WATER

DATE RECEIVED: 6/ 9/

SAMPLE ID : EQUIPMENT BLANK NAS KEY WEST BLDG 189

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	6/15- 6/16/93	ND	1	mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

QUALITY CONTROL SECTION

- Quality Control Summary
- Laboratory Blanks
- Laboratory Control Sample
- Matrix Spike/Matrix Spike Duplicate Results
- Sample Custody Documentation



ENSECO-WADSWORTH/ALERT
Laboratories

QUALITY ASSURANCE / QUALITY CONTROL
PROGRAM SUMMARY

Wadsworth/ALERT Laboratories considers continuous analytical method performance evaluations to be an integral portion of the data package, and routinely includes the pertinent QA/QC data associated with various analytical result reports. Brief discussions of the various QA/QC procedures utilized to measure acceptable method and matrix performance follow.

Surrogate Spike Recovery Evaluations

Known concentrations of designated surrogate spikes, consisting of a number of similar, non-method compounds or method compound analogues, are added, as appropriate, to routine GC and GC/MS sample fractions prior to extraction and analysis. The percent recovery determinations calculated from the subsequent analysis is an indication of the overall method efficiency for the individual sample. This surrogate spike recovery data is displayed alongside acceptable analytical method performance limits at the bottom of each applicable analytical result report sheet.

NOTE: Acceptable method performance for Base/Neutral Acid extractables is indicated by two (2) of three (3) surrogates for each fraction with a minimum recovery of ten (10) percent each. For Pesticides one (1) of two (2) surrogates meeting performance criteria is acceptable.

Laboratory Analytical Method Blank Evaluations

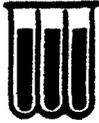
Laboratory analytical method blanks are systematically prepared and analyzed in order to continuously evaluate the system interferences and background contamination levels associated with each analytical method. These method blanks include all aspects of actual laboratory method analysis (chemical reagents, glassware, etc.), substituting laboratory reagent water or solid for actual sample. The method blank must not contain any analytes above the reported detection limit. The following common laboratory contaminants are exceptions to this rule provided they are not present at greater than five times the detection limit.

<u>Volatiles</u>	<u>Semi-volatiles</u>	<u>Metals</u>
Methylene chloride	Dimethyl phthalate	Calcium
Toluene	Diethyl phthalate	Magnesium
2-Butanone	Di-n-butyl phthalate	Sodium
Acetone	Butyl benzyl phthalate	
	Bis (2-ethylhexyl) phthalate	

A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method blanks.

Laboratory Analytical Method Check Sample Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to a laboratory reagent blank prior to extraction and analysis. Percent recovery determinations demonstrate the performance of the analytical method. Failure of a check sample to meet established laboratory recovery criteria is cause to stop the analysis until the problem is resolved.



QUALITY ASSURANCE / QUALITY CONTROL
PROGRAM SUMMARY
(cont'd)

At that time all associated samples must be re-analyzed. A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method check samples.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) Recovery Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to two of three separate aliquots of a sequentially predetermined sample prior to extraction and analysis. Percent recovery determinations are calculated from both of the spiked samples by comparison to the actual values generated from the unspiked sample. These percent recovery determinations indicate the accuracy of the analysis at recovering actual analytical method compounds from the matrix. Relative percent difference determinations calculated from a comparison of the MS/MSD recoveries demonstrate the precision of the analytical method. Actual percent recovery and relative percent difference data is displayed alongside their respective acceptable analytical method performance limits in the QA/QC section of the report. The MS/MSD are considered in control when the precision is within established control limits and the associated check sample has been found to be acceptable. A minimum of ten percent (10%) of all analyses are MS/MSD quality control samples.

*****EXAMPLE*****

COMPOUND	SAMPLE CONC.	MS %REC	MSD %REC	RPD	RPD	QC LIMITS RECOVERY
4,4'-DDT	0	95	112	16	22	66-119
Benzene	10	86	93	8	20	39-150
(cmpd. name)	sample result	1st% recov.	2nd% recov.	Rel.% diff.		accep. method perform range

Analytical Result Qualifiers

The following qualifiers, as defined below, may be appended to analytical results in order to allow proper interpretation of the results presented:

J - indicates an estimated concentration (typically used when a dilution, matrix interference or instrumental limitation prevents accurate quantitation of a particular analyte).

B - indicates the presence of a particular analyte in the laboratory blank analyzed concurrently with the samples. Results must be interpreted accordingly.

DIL - indicates that because of matrix interferences and/or high analyte concentrations, it was necessary to dilute the sample to a point where the surrogate or spike concentrations fell below a quantifiable amount and could not be reported.



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 3F0901-BK
MATRIX : WATER

DATE RECEIVED: 6/ 9/ -

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Tot Recoverable Pet Hydrocarbons	6/15- 6/16/93	ND	1 mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS

MATRIX : WATER

LABORATORY CONTROL SAMPLE RESULTS
WET CHEMISTRY

PARAMETER	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
TRPH (IR)	06/15/93	06/16/93	95	24 75-123	LCS

ENSECO-WADSWORTH/ALERT LABORATORIES SAMPLE SHIPPER EVALUATION AND RECEIPT FORM

Blng 189

Client: ABB Project Name/Number: NAS Key We
 Samples Received By: Carol Mc Nulty Date Received: 6/9/93
 (Signature)
 Sample Evaluation Form By: Carol Mc Nulty LAB No: 7113/3F0901
 (Signature)

Type of shipping container samples received in? WAL Cooler _____
 Client Cooler _____ WAL Shipper _____ Box _____ Other _____

Any "NO" responses or discrepancies should be explained in comments section.

	YES	NO
1. Were custody seals on shipping container(s) intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Were custody papers properly included with samples?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Were custody papers properly filled out (ink, signed, match labels)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Did all bottles arrive in good condition (unbroken)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5. Were all bottle labels complete (Sample No., date, signed, analysis preservatives)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. Were correct bottles used for the tests indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7. Were proper sample preservation techniques indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8. Were samples received within adequate holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9. Were all VOA bottles checked for the presence of air bubbles? (If air bubbles were found indicate in comment section)	<u>N/A</u>	<input type="checkbox"/>
10. Were samples in direct contact with wet ice? (NOTE TEMPERATURE BELOW)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
11. Were samples accepted into the laboratory? (If no see comments)	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Cooler # _____ Temp 8 °C Cooler # _____ Temp _____ °C
 Cooler # _____ Temp _____ °C Cooler # _____ Temp _____ °C

Comments: _____



WADSWORTH/ALERT
LABORATORIES
Sampling, testing, mobile labs

5910 Breckenridge Pkwy.
Suite 11
Tampa, FL 33610

Chain of Custody Record

(813) 621-0784
Fax (813) 623-6021

Record _____ of _____

10575

Client:		Project Name / Location			No. Of CON-TAINERS	Parameter										Remarks
Sampler(s)		Project #:				VOC--	PAH--	METALS--	TRPH--	EDB--						
Item #	Date	Time	MATRIX	Sample Location												
1				1207	1			1								
2				1209	1			1								
3				1209	1			1								
4				1209	1			1								
5				1209	1			1								
6				1209	1			1								
7				1209	1			1								
8				1209	1			1								
9				1209	1			1								
10																
11																

Total Containers **1**

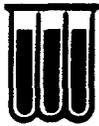
Number of Coolers in Shipment **[]**

Bailers **[]**

Report To:	Transfer Number	Item Number(s)	Relinquished By / Company	Accepted By / Company	Date	Time
Additional Comments: 1. 1209 samples analyzed 2. 1209 H.C. 3. 1209 H.C. 4. 1209 H.C. 5. 1209 H.C. 6. 1209 H.C.	1		1209 H.C. / 1209	1209 H.C. / 1209	1/17/09	12:14
	2					
	3					
	4					
	5					
	6					

Original Accompanies Shipment

**LABORATORY ANALYTICAL DATA FOR
GROUNDWATER SAMPLES COLLECTED
JUNE 10, 1993**



ENSECO-WADSWORTH/ALERT Laboratories

Division of Corning Lab Services, Inc

5910 Breckenridge Parkway, Suite H 813-621-0784
Tampa, FL 33610 FAX 813-623-6021

ANALYTICAL REPORT

SUBCONTRACT NUMBER: SE1-08-134

TASK ORDER NUMBER: 35

KEY WEST BLDG 189

Presented to:

ROGER DURHAM

ABB ENVIRONMENTAL SERVICES, INC.

ENSECO-WADSWORTH/ALERT LABORATORIES

5910 BRECKENRIDGE PARKWAY, SUITE H

TAMPA, FLORIDA 33610

(813) 621-0784

Joanne Anderson

**Joanne Anderson
Project Manager**

Randall C. Grubbs

**Randall C. Grubbs
Laboratory Director - Florida**

June 25, 1993



ENSECO-WADSWORTH/ALERT
Laboratories

INVOLVEMENT

This report summarizes the analytical results of the Key West Bldg 189 site submitted by ABB Environmental Services, Inc. to Enseco-Wadsworth/ALERT Laboratories who provided independent, analytical services for this project under the direction of Roger Durham. The samples were accepted into Wadsworth's Florida facility on 11 June 1993, in accordance with documented sample acceptance procedures. The associated analytical methods and sample results are outlined sequentially in this report.

Analytical results included in this report have been reviewed for compliance with the Laboratory QA/QC Plan as summarized in the Quality Control Section at the rear of the report. Sample custody documentation describing the number of samples and sample matrices is also included. Any qualifications and/or non-compliant items have been noted below.



ENSECO-WADSWORTH/ALERT
Laboratories

ANALYTICAL METHODS

Wadsworth/ALERT Laboratories utilizes only USEPA approved analytical methods and instrumentation. The analytical methods utilized for the analysis of these samples are listed below.

PARAMETER

METHOD

ORGANICS

Polynuclear Aromatic Hydrocarbons

** EPA Method 625

MISCELLANEOUS

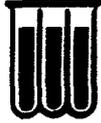
Tot. Rec. Petroleum Hydrocarbons

** EPA Method 418.1

NOTE:

** Indicates usage of this method to obtain results for this report.

(D) Indicates draft version of this method was used
EPA Methods Methods for Chemical Analysis of Water and Wastes, USEPA, 600/4-79-020, March, 1983. July, 1982
Std. Methods Drinking Waters USEPA, 600/4-88/039, December, 1988.
Standard Methods for the Examination of Water and Waste-water, APHA, 16th edition, 1985.
USEPA Methods From 40CFR Part 136, published in Federal Register on October 26, 1984.
SW846 Methods Test Methods for Evaluating Solid Waste Physical/Chemical Methods, 3rd Edition, USEPA, 1986.
ASTM Methods American Society for Testing and Materials.
NIOSH Method NIOSH Manual of Analytical Methods, National Institute for Occupational Safety and Health, 2nd Edition, April 1977.



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1108-1
MATRIX: WATER

DATE RECEIVED: 6/11,
DATE EXTRACTED: 6/14/93
DATE ANALYZED: 6/20/93

SAMPLE ID: MW-2

KEY WEST BLDG 189

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

CERTIFICATION #: E84059
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3-cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	19

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	78	(26-131)	(10-155)
Fluorobiphenyl	69	(27-119)	(12-153)
Terphenyl-d14	37	(10-165)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1108-1
MATRIX : WATER

DATE RECEIVED: 6/11/93

SAMPLE ID : MW-2

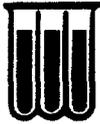
KEY WEST BLDG 189

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	6/22- 6/23/93	53	10	mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1108-2
MATRIX: WATER

DATE RECEIVED: 6/11,
DATE EXTRACTED: 6/14/93
DATE ANALYZED: 6/20/93

SAMPLE ID: MW-10

KEY WEST BLDG 189

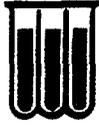
POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

CERTIFICATION #: E84059
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3 - cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	76	(26-131)	(10-155)
Fluorobiphenyl	71	(27-119)	(12-153)
Terphenyl-d14	40	(10-165)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 3F1108-2
MATRIX : WATER

DATE RECEIVED: 6/11/93

SAMPLE ID : MW-10

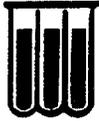
KEY WEST BLDG 189

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	6/22- 6/23/93	20	5	mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1108-3
MATRIX: WATER

DATE RECEIVED: 6/1
DATE EXTRACTED: 6/14/93
DATE ANALYZED: 6/20/93

SAMPLE ID: MW-11

KEY WEST BLDG 189

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

CERTIFICATION #: E84059
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3 - cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	74	(26-131)	(10-155)
Fluorobiphenyl	67	(27-119)	(12-153)
Terphenyl-d14	52	(10-165)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1108-3
MATRIX : WATER

DATE RECEIVED: 6/11/93

SAMPLE ID : MW-11

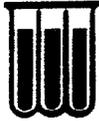
KEY WEST BLDG 189

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	6/22- 6/23/93	3	1	mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1108-4
MATRIX: WATER

DATE RECEIVED: 6/11
DATE EXTRACTED: 6/14/93
DATE ANALYZED: 6/20/93

SAMPLE ID: MW-12

KEY WEST BLDG 189

CERTIFICATION #: E84059

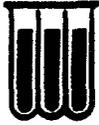
POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3 - cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	86	(26-131)	(10-155)
Fluorobiphenyl	81	(27-119)	(12-153)
Terphenyl-d14	60	(10-165)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1108-4
MATRIX : WATER

DATE RECEIVED: 6/11/93

SAMPLE ID : MW-12

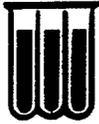
KEY WEST BLDG 189

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Tot Recoverable Pet Hydrocarbons	6/22- 6/23/93	ND	1 mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1108-5
MATRIX: WATER

DATE RECEIVED: 6/1
DATE EXTRACTED: 6/14/93
DATE ANALYZED: 6/20/93

SAMPLE ID: MW-13D

KEY WEST BLDG 189

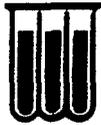
POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

CERTIFICATION #: E84059
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3 -cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	91	(26-131)	(10-155)
Fluorobiphenyl	81	(27-119)	(12-153)
Terphenyl-d14	50	(10-165)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 3F1108-5
MATRIX : WATER

DATE RECEIVED: 6/11/93

SAMPLE ID : MW-13D

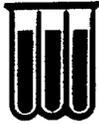
KEY WEST BLDG 189

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Tot Recoverable Pet Hydrocarbons	6/22- 6/23/93	ND	1 mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1108-6
MATRIX: WATER

DATE RECEIVED: 6/11,
DATE EXTRACTED: 6/14/93
DATE ANALYZED: 6/20/93

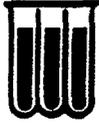
SAMPLE ID: DUPLICATE 2 KEY WEST BLDG 189

POLYNUCLEAR AROMATIC HYDROCARBONS CERTIFICATION #: E84059
METHOD 625 HSL/TCL LIST - GC/MS HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3 - cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	84	(26-131)	(10-155)
Fluorobiphenyl	78	(27-119)	(12-153)
Terphenyl-d14	56	(10-165)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1108-6
MATRIX : WATER

DATE RECEIVED: 6/11/93

SAMPLE ID : DUPLICATE 2 KEY WEST BLDG 189

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Tot Recoverable Pet Hydrocarbons	6/22- 6/23/93	2	1 mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1108-7
MATRIX: WATER

DATE RECEIVED: 6/1
DATE EXTRACTED: 6/14/93
DATE ANALYZED: 6/21/93

SAMPLE ID: EQUIPMENT BLANK KEY WEST BLDG 189

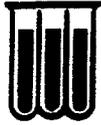
POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

CERTIFICATION #: E84059
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3-cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	87	(26-131)	(10-155)
Fluorobiphenyl	83	(27-119)	(12-153)
Terphenyl-d14	92	(10-165)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 3F1108-7
MATRIX : WATER

DATE RECEIVED: 6/11/93

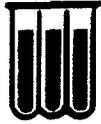
SAMPLE ID : EQUIPMENT BLANK KEY WEST BLDG 189

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	6/22- 6/23/93	ND	1	mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

QUALITY CONTROL SECTION

- Quality Control Summary
- Laboratory Blanks
- Laboratory Control Sample
- Matrix Spike/Matrix Spike Duplicate Results
- Sample Custody Documentation



ENSECO-WADSWORTH/ALERT
Laboratories

QUALITY ASSURANCE / QUALITY CONTROL PROGRAM SUMMARY

Wadsworth/ALERT Laboratories considers continuous analytical method performance evaluations to be an integral portion of the data package, and routinely includes the pertinent QA/QC data associated with various analytical result reports. Brief discussions of the various QA/QC procedures utilized to measure acceptable method and matrix performance follow.

Surrogate Spike Recovery Evaluations

Known concentrations of designated surrogate spikes, consisting of a number of similar, non-method compounds or method compound analogues, are added, as appropriate, to routine GC and GC/MS sample fractions prior to extraction and analysis. The percent recovery determinations calculated from the subsequent analysis is an indication of the overall method efficiency for the individual sample. This surrogate spike recovery data is displayed alongside acceptable analytical method performance limits at the bottom of each applicable analytical result report sheet.

NOTE: Acceptable method performance for Base/Neutral Acid extractables is indicated by two (2) of three (3) surrogates for each fraction with a minimum recovery of ten (10) percent each. For Pesticides one (1) of two (2) surrogates meeting performance criteria is acceptable.

Laboratory Analytical Method Blank Evaluations

Laboratory analytical method blanks are systematically prepared and analyzed in order to continuously evaluate the system interferences and background contamination levels associated with each analytical method. These method blanks include all aspects of actual laboratory method analysis (chemical reagents, glassware, etc.), substituting laboratory reagent water or solid for actual sample. The method blank must not contain any analytes above the reported detection limit. The following common laboratory contaminants are exceptions to this rule provided they are not present at greater than five times the detection limit.

<u>Volatiles</u>	<u>Semi-volatiles</u>	<u>Metals</u>
Methylene chloride	Dimethyl phthalate	Calcium
Toluene	Diethyl phthalate	Magnesium
2-Butanone	Di-n-butyl phthalate	Sodium
Acetone	Butyl benzyl phthalate	
	Bis (2-ethylhexyl) phthalate	

A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method blanks.

Laboratory Analytical Method Check Sample Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to a laboratory reagent blank prior to extraction and analysis. Percent recovery determinations demonstrate the performance of the analytical method. Failure of a check sample to meet established laboratory recovery criteria is cause to stop the analysis until the problem is resolved.



QUALITY ASSURANCE / QUALITY CONTROL
PROGRAM SUMMARY
(cont'd)

At that time all associated samples must be re-analyzed. A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method check samples.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) Recovery Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to two of three separate aliquots of a sequentially predetermined sample prior to extraction and analysis. Percent recovery determinations are calculated from both of the spiked samples by comparison to the actual values generated from the unspiked sample. These percent recovery determinations indicate the accuracy of the analysis at recovering actual analytical method compounds from the matrix. Relative percent difference determinations calculated from a comparison of the MS/MSD recoveries demonstrate the precision of the analytical method. Actual percent recovery and relative percent difference data is displayed alongside their respective acceptable analytical method performance limits in the QA/QC section of the report. The MS/MSD are considered in control when the precision is within established control limits and the associated check sample has been found to be acceptable. A minimum of ten percent (10%) of all analyses are MS/MSD quality control samples.

*****EXAMPLE*****

COMPOUND	SAMPLE CONC.	MS %REC	MSD %REC	RPD	RPD	QC LIMITS RECOVERY
4,4'-DDT	0	95	112	16	22	66-119
Benzene	10	86	93	8	20	39-150
(cmpd. name)	sample result	1st% recov.	2nd% recov.	Rel.% diff.		accep. method perform range

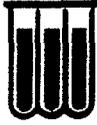
Analytical Result Qualifiers

The following qualifiers, as defined below, may be appended to analytical results in order to allow proper interpretation of the results presented:

J - indicates an estimated concentration (typically used when a dilution, matrix interference or instrumental limitation prevents accurate quantitation of a particular analyte).

B - indicates the presence of a particular analyte in the laboratory blank analyzed concurrently with the samples. Results must be interpreted accordingly.

DIL - indicates that because of matrix interferences and/or high analyte concentrations, it was necessary to dilute the sample to a point where the surrogate or spike concentrations fell below a quantifiable amount and could not be reported.



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1108-BK
MATRIX: WATER

DATE RECEIVED: 6/11/93
DATE EXTRACTED: 6/14/93
DATE ANALYZED: 6/20/93

SAMPLE ID: LABORATORY BLANK

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

CERTIFICATION #: E84059
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3-cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	78	(26-131)	(10-155)
Fluorobiphenyl	81	(27-119)	(12-153)
Terphenyl-d14	67	(10-165)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 3F1108-BK
MATRIX : WATER

DATE RECEIVED: 6/11/

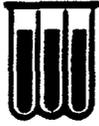
SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Tot Recoverable Pet Hydrocarbons	6/22- 6/23/93	ND	1 mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS
MATRIX : WATER
METHOD : 625
RUN ID : F0331

DATE EXTRACTED: 06/14/93
DATE ANALYZED : 06/20/93

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS	
			RPD	%REC
Naphthalene	F0331	119	45	36-127
1-Methylnaphthalene		93	47	35-129
Acenaphthene		138	43	55-142
Fluorene		90	33	59-125
Pyrene		99	69	25-163
Chrysene		75	61	30-152



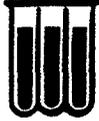
ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS

MATRIX : WATER

LABORATORY CONTROL SAMPLE RESULTS
WET CHEMISTRY

PARAMETER	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
TRPH (IR)	06/23/93	06/23/93	92	24 75-123	LCS



ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : 3F1108-1
MATRIX : WATER
METHOD : 625
RUN ID : F0344/F0345

DATE RECEIVED : 06/11/93
DATE PREPARED : 06/14/93
DATE ANALYZED : 06/21/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS	MSD	RPD	QC LIMITS	
		%REC	%REC		RPD	%REC
Naphthalene	F0344/F0345	125	112	11	23	25-97
1-Methylnaphthalene		85	86	1	24	48-101
Acenaphthene		137	124	10	24	57-104
Fluorene		80	76	5	28	34-118
Pyrene		94	94	0	30	58-148
Chrysene		65	61	6	36	48-118

* = Diluted Out

ENSECO-WADSWORTH/ALERT LABORATORIES SAMPLE SHIPPER EVALUATION AND RECEIPT FORM

Client: ABB Project Name/Number: Bldg 103 & 139
 Samples Received By: [Signature] / WAD Date Received: 10-11-93
 (Signature)
 Sample Evaluation Form By: [Signature] / WAD LAB No: 7132/3F1108
 (Signature)

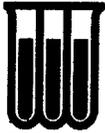
Type of shipping container samples received in? WAL Cooler
 Client Cooler WAL Shipper Box Other

Any "NO" responses or discrepancies should be explained in comments section.

- | | YES | NO |
|---|-------------------------------------|--------------------------|
| 1. Were custody seals on shipping container(s) intact? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Were custody papers properly included with samples? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Were custody papers properly filled out (ink, signed, match labels)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Did all bottles arrive in good condition (unbroken)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 5. Were all bottle labels complete (Sample No., date, signed, analysis preservatives)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 6. Were correct bottles used for the tests indicated? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 7. Were proper sample preservation techniques indicated? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 8. Were samples received within adequate holding time? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 9. Were all VOA bottles checked for the presence of air bubbles?
(If air bubbles were found indicate in comment section) | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 10. Were samples in direct contact with wet ice?
(NOTE TEMPERATURE BELOW) | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 11. Were samples accepted into the laboratory?
(If no see comments) | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Cooler # B91 Temp 8 °C Cooler # B520 Temp 5 °C
 Cooler # L30 Temp 5 °C Cooler # A402 Temp 5 °C

Comments: COLOR, DO received out of hold time. B527 3°C



**WADSWORTH/ALERT
LABORATORIES**
Sampling, testing, mobile labs

5910 Breckenridge Pkwy.
Suite H
Tampa, FL 33610

Chain of Custody Record

(813) 621-0784
Fax (813) 623-6021

Record _____ of _____

08742

Client: ABB-ES		Project Name / Location KF-15T		Project #: BLDG 189	No. Of CON-TAINERS	Parameter										Remarks		
Sampler(s) R. Durham C. Hand		Date	Time			MATRIX	Sample Location	VOC-	PAH-	METALS-	TRPH-	EDB-						
1	6/16/93	0845	H2O	EQUIPMENT BLANK	3		2	1										
2	6/16/93	0950	H2O	MW2	3		2	1										
3	6/16/93	1015	H2O	MW11	3		2	1										
4	6/16/93	1040	H2O	MW12	3		2	1										
5	6/16/93	1105	H2O	MW10	3		2	1										
6	6/16/93	1120	H2O	MW13D	3		2	1										
7	6/16/93	—	H2O	DUPLICATE 2	3		2	1										
8																		
9																		
10																		
11																		

Total Containers **21** Number of Coolers in Shipment Bailers

Report To:	Transfer Number	Item Number(s)	Relinquished By / Company	Accepted By / Company	Date	Time
Roger Durham	1					
Additional Comments: TPM Preserved with HCL	2					
	3					
	4					
	5					
	6					

APPENDIX C
LITHOLOGIC LOGS

TITLE: NAS Key West, Truman Annex		LOG of WELL: KYW-189-MW10	BORING NO. SB14
CLIENT: SOUTHNAVFACENCOM		PROJECT NO: 7519-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 6/07/93	COMPLTD: 6/07/93
METHOD: 4.25" HSA	CASE SIZE: 2 inch	SCREEN INT.: 3 - 13 FT.	PROTECTION LEVEL: D
TOC ELEV.: 10.22 FT.	MONITOR INST.: OVA	TOT DPTH: 13FT.	DPTH TO ∇ 6.03 FT.
LOGGED BY: R. Durham	WELL DEVELOPMENT DATE: 6/08/93		SITE: Bldg. 189, Berthing Wharf

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
			<1					
			<1					
5				SAND: gray, fine-grained to silty mixed with small limestone pebbles				
10								
15								
20								

TITLE: NAS Key West, Truman Annex		LOG of WELL: KYW-189-MW11	BORING NO. SB15
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7519-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 6/07/93	COMPLTD: 6/07/93
METHOD: 4.25" HSA	CASE SIZE: 2 inch	SCREEN INT.: 3 - 13 FT.	PROTECTION LEVEL: D
TOC ELEV.: 10.45 FT.	MONITOR INST.: OVA	TOT DPTH: 13FT.	DPTH TO ∇ 6.17 FT.
LOGGED BY: R. Durham	WELL DEVELOPMENT DATE: 6/08/93		SITE: Bldg. 189, Berthing Wharf

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
			<1					
			<1					
			<1	SAND: gray, fine-grained to silty mixed with small to medium limestone pebbles.				
5			<1					
				SAND: gray, fine-grained to silty mixed with small to medium limestone pebbles, some shell fragments, slight diesel/sulfur odor.				
10								
15								
20								

TITLE: NAS Key West, Truman Annex		LOG of WELL: KYW-189-MW12	BORING NO. SB16
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7519-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 6/07/93	COMPLTD: 6/07/93
METHOD: 4.25" HSA	CASE SIZE: 2 inch	SCREEN INT.: 3 - 13 FT.	PROTECTION LEVEL: D
TOC ELEV.: 10.57 FT.	MONITOR INST.: OVA	TOT DPTH: 13FT.	DPTH TO ∇ 6.23 FT.
LOGGED BY: R. Durham	WELL DEVELOPMENT DATE: 6/09/93		SITE: Bldg. 189, Berthing Wharf

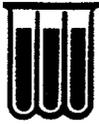
DEPTH F.T.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0			<1					
0			<1					
0			<1	SAND: beige, fine- to medium-grained, small limestone pebbles.				
5			<1					
5				SAND: gray, fine-grained to silty mixed with limestone pebbles, slight sulfur odor.				
10								
15								
20								

TITLE: NAS Key West, Truman Annex		LOG of WELL: KYW-189-MW13D	BORING NO. SB17
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7519-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 6/09/93	COMPLTD: 6/09/93
METHOD: 4.25" HSA	CASE SIZE: 2 inch	SCREEN INT.: 30 - 35 FT.	PROTECTION LEVEL: D
TOC ELEV.: 10.52 FT.	MONITOR INST.: OVA	TOT DPTH: 13FT.	DPTH TO ∇ 6.37 FT.
LOGGED BY: R. Durham	WELL DEVELOPMENT DATE: 6/09/93		SITE: Bldg. 189, Berthing Wharf

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5				<1	SAND: gray, fine- to medium-grained, moderate limestone pebbles.				
10			1.0/2	<1	SAND: gray to beige, fine- to medium-grained, large limestone pebbles and some shell fragments, sulfur odor.			12,6,6,8	
15			1.0/2		SAND: beige, fine-grained to silty, small limestone pebbles, sulfur odor.			3,6,6,5	
20			2.0/2					4,1,8,10	
25			1.8/2		SAND: gray, tan, beige and brown, silt to medium-grained, moderate to large limestone pebbles, thin brown layer of organic material at 21' bls, consolidated layer of limestone at 25' bls.			48,30,35,32	
30						LIMESTONE			
35			1.8/2		LIMESTONE: beige and tan, sandy.			15,18,26,44	

APPENDIX D

**LABORATORY ANALYTICAL DATA
FOR SEDIMENT SAMPLE COLLECTED
JUNE 10, 1993**



ENSECO-WADSWORTH/ALERT Laboratories

Division of Corning Lab Services, Inc

5910 Breckenridge Parkway, Suite H 813-621-0784
Tampa, FL 33610 FAX 813-623-6021

ANALYTICAL REPORT

SUBCONTRACT NUMBER: SE1-08-134

TASK ORDER NO. 35

Presented to:

ROGER DURHAM

ABB ENVIRONMENTAL SERVICES, INC.

ENSECO-WADSWORTH/ALERT LABORATORIES

5910 BRECKENRIDGE PARKWAY, SUITE H

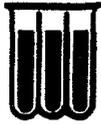
TAMPA, FLORIDA 33610

(813) 621-0784

Joanne M. Anderson
Joanne Anderson
Project Manager

Randall C. Grubbs
Laboratory Director - Florida

July 13, 1993

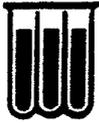


ENSECO-WADSWORTH/ALERT
Laboratories

INVOLVEMENT

This report summarizes the analytical results of the Key West Bldg. 189 site submitted by ABB Environmental Services, Inc. to Enseco-Wadsworth/ALERT Laboratories who provided independent, analytical services for this project under the direction of 14 June 1993. The samples were accepted into Wadsworth's Florida facility on 14 June 1993, in accordance with documented sample acceptance procedures. The Total Petroleum Hydrocarbon and Total Organic Carbon analyses were performed by our N. Canton, Ohio facility Lab #E87225. The grain size analysis was performed by Thornton Laboratories, Inc. The associated analytical methods and sample results are outlined sequentially in this report.

Analytical results included in this report have been reviewed for compliance with the Laboratory QA/QC Plan as summarized in the Quality Control Section at the rear of the report. Sample custody documentation describing the number of samples and sample matrices is also included. Any qualifications and/or non-compliant items have been noted below.



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1407-1
MATRIX: SOIL

DATE RECEIVED: 6/11/93
DATE EXTRACTED: NA
DATE ANALYZED: 6/15/93

SAMPLE ID: SB18(0-2')

KEY WEST BLDG. 189

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
USEPA METHOD 8240 - GC/MS

DRY WEIGHT (%): 82

Acetone	ND**	cis-1,3-Dichloropropene	ND
Benzene	ND	trans-1,3-dichloropropene	ND
Bromodichloromethane	ND	Ethylbenzene	ND
Bromoform	ND	2-Hexanone	ND**
Bromomethane	ND	Methylene chloride	ND
2-Butanone	ND**	4-Methyl-2-pentanone	ND**
Carbon disulfide	ND	Styrene	ND
Carbon tetrachloride	ND	1,1,2,2-Tetrachloroethane	ND
Chlorobenzene	ND	Tetrachloroethene	ND
Chlorodibromomethane	ND	Toluene	ND
Chloroethane	ND	1,1,1-Trichloroethane	ND
Chloroform	ND	1,1,2-Trichloroethane	ND
Chloromethane	ND	Trichloroethene	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
1,2-Dichloroethane	ND	Xylene(Total)	ND
1,1-Dichloroethene	ND		
1,2-Dichloroethene(Total)	ND		
1,2-Dichloropropane	ND		

NOTE: ND (None Detected, lower detectable limit = 2 ug/L) dry weight
 ND* (None Detected, lower detectable limit = ug/L) dry weight
 ND** (None Detected, lower detectable limit = 20 ug/L) dry weight
 J (Detected, but below quantitation limit; estimated value)
 B (Compound detected in method blank associated with this sample)
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS		
		WATER	SOLID	LOW LEVEL
1,2-Dichloroethane	109	(78-130)	(85-126)	(85-138)
Toluene-d8	115	(90-109)	(89-124)	(89-128)
Bromofluorobenzene	124	(81-117)	(84-124)	(83-128)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1407-1
MATRIX: SOIL

DATE RECEIVED: 6/11,
DATE EXTRACTED: 6/15/93
DATE ANALYZED: 6/23/93

SAMPLE ID: SB18(0-2')

KEY WEST BLDG. 189

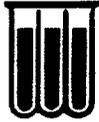
CERTIFICATION #: E84059
HRS84297

BASE/NEUTRAL EXTRACTABLE ORGANICS
USEPA METHOD 8270 - GC/MS (1 of 2)

DRY WEIGHT (%): 82

Acenaphthene	ND	Dibenzo(a,h)anthracene	0.41
Acenaphthylene	ND	Di-n-butyl phthalate	ND
Anthracene	0.46	1,2-Dichlorobenzene	ND
Benzidine	ND*	1,3-Dichlorobenzene	ND
Benzo(a)anthracene	1.7	1,4-Dichlorobenzene	ND
Benzo(b)fluoranthene	ND	3,3'-Dichlorobenzidine	ND*
Benzo(k)fluoranthene	2.9	Diethyl phthalate	ND
Benzo(ghi)perylene	0.61	Dimethyl phthalate	ND
Benzo(a)pyrene	1.4	2,4-Dinitrotoluene	ND
Bis(2-Chloroethoxy)methane	ND	2,6-Dinitrotoluene	ND
Bis(2-Chloroethyl)ether	ND	Di-n-octyl phthalate	ND
Bis(2-Chloroisopropyl)ether	ND	Fluoranthene	ND
Bis(2-Ethylhexyl)phthalate	ND	Fluorene	3.2
4-Bromophenyl phenyl ether	ND	Hexachlorobenzene	ND
Butyl benzyl phthalate	ND	Hexachlorobutadiene	ND
2-Chloronaphthalene	ND	Hexachlorocyclopentadiene	ND
4-Chlorophenyl phenyl ether	ND	Hexachloroethane	ND
Chrysene	1.7	Indeno(1,2,3-cd)pyrene	0.70

NOTE: ND (None Detected, lower detectable limit = 0.33 mg/kg) dry weight
ND* (None Detected, lower detectable limit = 1.7 mg/kg) dry weight
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1407-1
MATRIX: SOIL

DATE RECEIVED: 6/11/93
DATE EXTRACTED: 6/15/93
DATE ANALYZED: 6/23/93

SAMPLE ID: SB18(0-2')

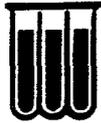
KEY WEST BLDG. 189

CERTIFICATION #: E84059
HRS84297
BASE/NEUTRAL EXTRACTABLE ORGANICS
USEPA METHOD 8270 - GC/MS (2 of 2)

Isophorone	ND
Naphthalene	ND
Nitrobenzene	ND
N-Nitrosodimethylamine	ND
N-Nitrosodiphenylamine	ND
N-Nitrosodi-n-propylamine	ND
Phenanthrene	1.6
Pyrene	2.7
1,2,4-Trichlorobenzene	ND

NOTE: ND (None Detected, lower detectable limit = 0.33 mg/kg) dry weight
ND* (None Detected, lower detectable limit = 1.7 mg/kg) dry weight
J (Detected, but below quantitation limit: estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	78	(22-135)	(10-155)
Fluorobiphenyl	68	(34-140)	(12-153)
Terphenyl-d14	70	(10-132)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1407-1
MATRIX: SOIL

DATE RECEIVED: 6/11
DATE EXTRACTED: 6/15/93
DATE ANALYZED: 6/23/93

SAMPLE ID: SB18(0-2')

KEY WEST BLDG. 189

ACID EXTRACTABLE ORGANICS
USEPA METHOD 8270 - GC/MS

CERTIFICATION #: E84059
HRS84297

DRY WEIGHT (%): 82

4-Chloro-3-methylphenol	ND
2-Chlorophenol	ND
2,4-Dichlorophenol	ND
2,4-Dimethylphenol	ND
2,4-Dinitrophenol	ND*
2-Methyl-4,6-dinitrophenol	ND*
2-Nitrophenol	ND
4-Nitrophenol	ND*
Pentachlorophenol	ND*
Phenol	ND
2,4,6-Trichlorophenol	ND

NOTE: ND (None Detected, lower detectable limit = 0.33 mg/kg) dry weight
 ND* (None Detected, lower detectable limit = 1.7 mg/kg) dry weight
 J (Detected, but below quantitation limit; estimated value)
 B (Compound detected in method blank associated with this sample)
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
2-Fluorophenol	65	(10-116)	(24-118)
Phenol-d6	78	(10-175)	(17-124)
2,4,6-Tribromophenol	47	(10-155)	(10-156)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1407-1
MATRIX: SOIL

DATE RECEIVED: 6/11/93
DATE EXTRACTED: 6/15/93
DATE ANALYZED: 6/23/93

SAMPLE ID: SB18(0-2')

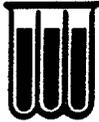
KEY WEST BLDG. 189

EXTRACTABLE ORGANICS
OTHER COMPOUNDS

CERTIFICATION #: E84059
HRS84297

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS
with their estimated concentrations

Bis(2-methoxyethyl)phthalate	0.35	mg/kg
Benzene, 1,3-dimethyl	0.86	mg/kg
4H-Cyclopenta[def]phenanthrene	0.38	mg/kg
11H-Benzo[b]fluorene	0.29	mg/kg
Pyrene, 1-methyl	0.25	mg/kg
Benzonitrile, 4,4'-(1,2-ethenediyl)bis	0.16	mg/kg
Benzo[ghi]fluoranthene	0.16	mg/kg
Benzo[c]phenanthrene	0.13	mg/kg
Benzo[e]pyrene	0.29	mg/kg
Perylene	0.80	mg/kg



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1407-1
MATRIX : SOIL

DATE RECEIVED: 6/11/93

SAMPLE ID : SB18(0-2')

KEY WEST BLDG. 189

METALS ANALYTICAL REPORT
SELECTED LIST

CERTIFICATION #: E84059
HRS84297

Total metals analysis results - dry weight basis

DRY WEIGHT (%): 82

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Arsenic	6/21/93	2.7	0.5	mg/kg
Cadmium	6/21/93	ND	0.5	mg/kg
Chromium	6/21/93	17	2.5	mg/kg
Lead	6/21/93	38	2.5	mg/kg

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES

DATE RECEIVED: 06/14/93

LAB #: 3F1407-1

MATRIX: SOIL

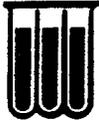
SAMPLE ID: SB18 (0-2') KEY WEST BLDG. 189

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Dry Weight		82		
Tot. Rec. Petroleum Hydrocarbons	6/15 - 6/16/93	51	5	mg/kg

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

QUALITY CONTROL SECTION

- Quality Control Summary
- Laboratory Blanks
- Laboratory Control Sample
- Matrix Spike/Matrix Spike Duplicate Results
- Sample Custody Documentation



ENSECO-WADSWORTH/ALERT
Laboratories

QUALITY ASSURANCE / QUALITY CONTROL
PROGRAM SUMMARY

Wadsworth/ALERT Laboratories considers continuous analytical method performance evaluations to be an integral portion of the data package, and routinely includes the pertinent QA/QC data associated with various analytical result reports. Brief discussions of the various QA/QC procedures utilized to measure acceptable method and matrix performance follow.

Surrogate Spike Recovery Evaluations

Known concentrations of designated surrogate spikes, consisting of a number of similar, non-method compounds or method compound analogues, are added, as appropriate, to routine GC and GC/MS sample fractions prior to extraction and analysis. The percent recovery determinations calculated from the subsequent analysis is an indication of the overall method efficiency for the individual sample. This surrogate spike recovery data is displayed alongside acceptable analytical method performance limits at the bottom of each applicable analytical result report sheet.

NOTE: Acceptable method performance for Base/Neutral Acid extractables is indicated by two (2) of three (3) surrogates for each fraction with a minimum recovery of ten (10) percent each. For Pesticides one (1) of two (2) surrogates meeting performance criteria is acceptable.

Laboratory Analytical Method Blank Evaluations

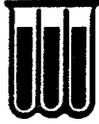
Laboratory analytical method blanks are systematically prepared and analyzed in order to continuously evaluate the system interferences and background contamination levels associated with each analytical method. These method blanks include all aspects of actual laboratory method analysis (chemical reagents, glassware, etc.), substituting laboratory reagent water or solid for actual sample. The method blank must not contain any analytes above the reported detection limit. The following common laboratory contaminants are exceptions to this rule provided they are not present at greater than five times the detection limit.

<u>Volatiles</u>	<u>Semi-volatiles</u>	<u>Metals</u>
Methylene chloride	Dimethyl phthalate	Calcium
Toluene	Diethyl phthalate	Magnesium
2-Butanone	Di-n-butyl phthalate	Sodium
Acetone	Butyl benzyl phthalate	
	Bis (2-ethylhexyl) phthalate	

A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method blanks.

Laboratory Analytical Method Check Sample Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to a laboratory reagent blank prior to extraction and analysis. Percent recovery determinations demonstrate the performance of the analytical method. Failure of a check sample to meet established laboratory recovery criteria is cause to stop the analysis until the problem is resolved.



QUALITY ASSURANCE / QUALITY CONTROL
PROGRAM SUMMARY
(cont'd)

At that time all associated samples must be re-analyzed. A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method check samples.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) Recovery Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to two of three separate aliquots of a sequentially predetermined sample prior to extraction and analysis. Percent recovery determinations are calculated from both of the spiked samples by comparison to the actual values generated from the unspiked sample. These percent recovery determinations indicate the accuracy of the analysis at recovering actual analytical method compounds from the matrix. Relative percent difference determinations calculated from a comparison of the MS/MSD recoveries demonstrate the precision of the analytical method. Actual percent recovery and relative percent difference data is displayed alongside their respective acceptable analytical method performance limits in the QA/QC section of the report. The MS/MSD are considered in control when the precision is within established control limits and the associated check sample has been found to be acceptable. A minimum of ten percent (10%) of all analyses are MS/MSD quality control samples.

*****EXAMPLE*****

COMPOUND	SAMPLE CONC.	MS %REC	MSD %REC	RPD	RPD	QC LIMITS RECOVERY
4,4'-DDT	0	95	112	16	22	66-119
Benzene	10	86	93	8	20	39-150
(cmpd. name)	sample result	1st% recov.	2nd% recov.	Rel.% diff.		accep. method perform range

Analytical Result Qualifiers

The following qualifiers, as defined below, may be appended to analytical results in order to allow proper interpretation of the results presented:

J - indicates an estimated concentration (typically used when a dilution, matrix interference or instrumental limitation prevents accurate quantitation of a particular analyte).

B - indicates the presence of a particular analyte in the laboratory blank analyzed concurrently with the samples. Results must be interpreted accordingly.

DIL - indicates that because of matrix interferences and/or high analyte concentrations, it was necessary to dilute the sample to a point where the surrogate or spike concentrations fell below a quantifiable amount and could not be reported.



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1407-BK
MATRIX: SOIL

DATE RECEIVED: 6/11/93
DATE EXTRACTED: NA
DATE ANALYZED: 6/15/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
USEPA METHOD 8240 - GC/MS

Acetone	ND**	cis-1,3-Dichloropropene	ND
Benzene	ND	trans-1,3-dichloropropene	ND
Bromodichloromethane	ND	Ethylbenzene	ND
Bromoform	ND	2-Hexanone	ND**
Bromomethane	ND	Methylene chloride	ND
2-Butanone	ND**	4-Methyl-2-pentanone	ND**
Carbon disulfide	ND	Styrene	ND
Carbon tetrachloride	ND	1,1,2,2-Tetrachloroethane	ND
Chlorobenzene	ND	Tetrachloroethene	ND
Chlorodibromomethane	ND	Toluene	ND
Chloroethane	ND	1,1,1-Trichloroethane	ND
Chloroform	ND	1,1,2-Trichloroethane	ND
Chloromethane	ND	Trichloroethene	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
1,2-Dichloroethane	ND	Xylene(Total)	ND
1,1-Dichloroethene	ND		
1,2-Dichloroethene(Total)	ND		
1,2-Dichloropropane	ND		

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 ND** (None Detected, lower detectable limit = 10 ug/L) as rec'd
 J (Detected, but below quantitation limit; estimated value)
 B (Compound detected in method blank associated with this sample)
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS		
		WATER	SOLID	LOW LEVEL
1,2-Dichloroethane	124	(78-130)	(85-126)	(85-138)
Toluene-d8	107	(90-109)	(89-124)	(89-128)
Bromofluorobenzene	105	(81-117)	(84-124)	(83-128)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1407-BK
MATRIX: SOIL

DATE RECEIVED: 6/1
DATE EXTRACTED: 6/15/93
DATE ANALYZED: 6/22/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059
BASE/NEUTRAL EXTRACTABLE ORGANICS HRS84297
USEPA METHOD 8270 - GC/MS (1 of 2)

Acenaphthene	ND	Dibenzo (a, h) anthracene	ND
Acenaphthylene	ND	Di-n-butyl phthalate	ND
Anthracene	ND	1,2-Dichlorobenzene	ND
Benzo (a) anthracene	ND	1,3-Dichlorobenzene	ND
Benzo (b) fluoanthene	ND	1,4-Dichlorobenzene	ND
		3,3'-Dichlorobenzidine	ND*
Benzo (k) fluoanthene	ND	Diethyl phthalate	ND
Benzo (ghi) perylene	ND	Dimethyl phthalate	ND
Benzo (a) pyrene	ND	2,4-Dinitrotoluene	ND
Bis (2-Chloroethoxy)methane	ND	2,6-Dinitrotoluene	ND
Bis (2-Chloroethyl) ether	ND	Di-n-octyl phthalate	ND
Bis (2-Chloroisopropyl) ether	ND	Fluoranthene	ND
Bis (2-Ethylhexyl) phthalate	ND	Fluorene	ND
4-Bromophenyl phenyl ether	ND	Hexachlorobenzene	ND
Butyl benzyl phthalate	ND	Hexachlorobutadiene	ND
2-Chloronaphthalene	ND	Hexachlorocyclopentadiene	ND
4-Chlorophenyl phenyl ether	ND	Hexachloroethane	ND
Chrysene	ND	Indeno (1,2,3-cd) pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 0.33 mg/kg) as rec'd
 ND* (None Detected, lower detectable limit = 1.7 mg/kg) as rec'd
 J (Detected, but below quantitation limit; estimated value)
 B (Compound detected in method blank associated with this sample)
 -- (Not Analyzed)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1407-BK
MATRIX: SOIL

DATE RECEIVED: 6/11/93
DATE EXTRACTED: 6/15/93
DATE ANALYZED: 6/22/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059
BASE/NEUTRAL EXTRACTABLE ORGANICS HRS84297
USEPA METHOD 8270 - GC/MS (2 of 2)

Isophorone	ND
Naphthalene	ND
Nitrobenzene	ND
N-Nitrosodimethylamine	ND
N-Nitrosodiphenylamine	ND
N-Nitrosodi-n-propylamine	ND
Phenanthrene	ND
Pyrene	ND
1,2,4-Trichlorobenzene	ND

NOTE: ND (None Detected, lower detectable limit = 0.33 mg/kg) as rec'd
ND* (None Detected, lower detectable limit = 1.7 mg/kg) as rec'd
J (Detected, but below quantitation limit: estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	91	(22-135)	(10-155)
Fluorobiphenyl	83	(34-140)	(12-153)
Terphenyl-d14	86	(10-132)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1407-BK
MATRIX: SOIL

DATE RECEIVED: 6/11/93
DATE EXTRACTED: 6/15/93
DATE ANALYZED: 6/22/93

SAMPLE ID: LABORATORY BLANK

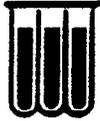
ACID EXTRACTABLE ORGANICS
USEPA METHOD 8270 - GC/MS

CERTIFICATION #: E84059
HRS84297

4-Chloro-3-methylphenol	ND
2-Chlorophenol	ND
2,4-Dichlorophenol	ND
2,4-Dimethylphenol	ND
2,4-Dinitrophenol	ND*
2-Methyl-4,6-dinitrophenol	ND*
2-Nitrophenol	ND
4-Nitrophenol	ND*
Pentachlorophenol	ND*
Phenol	ND
2,4,6-Trichlorophenol	ND

NOTE: ND (None Detected, lower detectable limit = 0.33 mg/kg) as rec'd
ND* (None Detected, lower detectable limit = 1.7 mg/kg) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
2-Fluorophenol	81	(10-116)	(24-118)
Phenol-d6	89	(10-175)	(17-124)
2,4,6-Tribromophenol	82	(10-155)	(10-156)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F1407-BK
MATRIX: SOIL

DATE RECEIVED: 6/11/93
DATE EXTRACTED: 6/24/93
DATE ANALYZED: 6/25/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (mg/kg)	DETECTION LIMIT
Total Petroleum Hydrocarbons-GC (extractable)	ND	10

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 3F1407-BK
MATRIX : SOIL

DATE RECEIVED: 6/11/

SAMPLE ID : LABORATORY BLANK

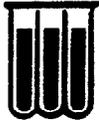
CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Arsenic	6/21/93	ND	0.01	mg/L
Cadmium	6/21/93	ND	0.01	mg/L
Chromium	6/21/93	ND	0.05	mg/L
Lead	6/21/93	ND	0.05	mg/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 3F1407-BK
MATRIX : SOIL

DATE RECEIVED: 6/11/93

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Ammonia Nitrogen	6/24/93	ND	0.5	mg/L
Nitrate-Nitrite Nitrogen	6/28/93	ND	0.05	mg/L
Phosphate Phosphorus	6/28/93	ND	0.10	mg/L
Total Kjeldahl Nitrogen	6/24/93	ND	0.5	mg/L
Total Organic Carbon	7/ 1/93	ND	50	mg/kg
Tot Recoverable Pet Hydrocarbons	6/15- 6/16/93	ND	5	mg/kg

NOTE: ND (None Detected)



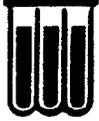
ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS
MATRIX : SOIL
METHOD : 8240
RUN ID : FS108

DATE EXTRACTED: N/A
DATE ANALYZED : 06/15/93

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
1,1-Dichloroethene	FS108	129	50 52-152
Benzene		115	21 78-120
Trichloroethene		93	19 73-112
Dichlorobromomethane		102	33 57-123
Toluene		110	18 80-117
Chlorobenzene		97	14 75-103



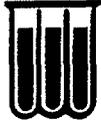
ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS
MATRIX : SOIL
METHOD : 8270
RUN ID : F0388

DATE EXTRACTED: 06/15/93
DATE ANALYZED : 06/22/93

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
1,4-Dichlorobenzene	F0388	96	42 31-115
N-Nitrosodi-n-propylamine		83	52 31-137
1,2,4 Trichlorobenzene		79	47 29-123
Acenaphthene		77	57 41-155
2,4-Dinitrotoluene		74	52 22-127
Pyrene		82	63 15-142



ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS
MATRIX : SOIL
METHOD : 8270
RUN ID : F0388

DATE EXTRACTED: 06/15/93
DATE ANALYZED : 06/22/93

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS	
			RPD	%REC
Phenol	F0388	68	44	26-115
2-Chlorophenol		73	53	14-120
4-Chloro-3-methylphenol		76	43	35-121
4-Nitrophenol		85	59	16-135
Pentachlorophenol		42	57	10-123



ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID: LCS
MATRIX: WATER

DATE PREPARED: 06/24/93
DATE ANALYZED: 06/25/93

LABORATORY CONTROL SAMPLE RESULTS
WET CHEMISTRY

PARAMETER	LCS %REC	QC LIMITS RECOVERY

Total Petroleum Hydrocarbons	69	38-120



THORNTON LABORATORIES, INC.
MARINE, ANALYTICAL AND ENVIRONMENTAL SERVICES

1145 EAST CASS STREET, TAMPA, FLORIDA 33602
P.O. BOX 2880, TAMPA, FLORIDA 33601-2880
HRS# 84147 HRS# E84100

TELEPHONE (813) 223-9702
FAX (813) 223-9332

21-Jun-1993
Page 2

Report For: Wadsworth/Alert Laboratories, Inc.
5910 Breckenridge Pkwy.
Suite H
Tampa, FL 33610

Sample Identification:

Soil
ID: 3F 1407-3

attn: Carol McNulty

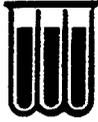
Date Received: 15-Jun-1993

Laboratory Number: 867183

CERTIFICATE OF ANALYSIS

Method	Parameter	Result	Units
	75 %	2.93	
	84 %	5.57	
	95 %	11.03	
	STATISTICS		
	Graphic Mean	1.18	
	Graphic Standard Deviation	4.69	
	Graphic Skewness	0.07	
	Kurtosis	1.38	

THORNTON LABORATORIES, INC.
Tina Logan



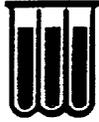
ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS

MATRIX : SOIL

LABORATORY CONTROL SAMPLE RESULTS
METALS

ELEMENT	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
Arsenic furnace	06/21/93	06/21/93	85	22 68-111	LCS
Cadmium	06/21/93	06/21/93	86	18 71-106	
Chromium	06/21/93	06/21/93	93	22 71-114	
Lead	06/21/93	06/21/93	89	21 72-114	



ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS

MATRIX : SOIL

LABORATORY CONTROL SAMPLE RESULTS
WET CHEMISTRY

PARAMETER	DATE	DATE	LCS	QC LIMITS		
	PREPARED	ANALYZED	%REC	RPD	%REC	
Ammonia Nitrogen	06/24/93	06/24/93	104	16	86-119	LCS
Total Kjeldahl Nitrogen	06/24/93	06/24/93	109	10	92-109	
Phosphate Phosphorus	06/28/93	06/28/93	89	30	66-126	
Nitrate Nitrogen	06/28/93	06/28/93	100	21	76-119	



ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID: LCS
MATRIX: WATER

DATE PREPARED: 07/01/93
DATE ANALYZED: 07/01/93

LABORATORY CONTROL SAMPLE RESULTS
WET CHEMISTRY

PARAMETER	LCS % REC	QC LIMITS % REC
Total Organic Carbon	103	83-120



ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS

MATRIX : SOIL

LABORATORY CONTROL SAMPLE RESULTS
WET CHEMISTRY

PARAMETER	DATE PREPARED	DATE ANALYZED	LCS %REC	ON LIMITS RPD %REC	
TRPH (IR)	06/15/93	06/16/93	92	35 56-125	LCS



ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : 3F1407-1
MATRIX : SOIL
METHOD : 8270
RUN ID : F0410/F0411

DATE RECEIVED : 06/11/93
DATE PREPARED : 06/15/93
DATE ANALYZED : 06/23/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	QC LIMITS		
				RPD	RPD	%REC
1,4-Dichlorobenzene	F0410/F0411	103	110	7	43	20-132
N-Nitrosodi-n-propylamine		83	85	2	44	25-114
1,2,4 Trichlorobenzene		88	93	6	24	38-136
Acenaphthene		123	137	11	22	34-122
2,4-Dinitrotoluene		82	86	5	41	10-119
Pyrene		14	44	103	26	38-141

* = Diluted Out



ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : 3F1407-1
MATRIX : SOIL
METHOD : 8270
RUN ID : F0410/F0411

DATE RECEIVED : 06/11/93
DATE PREPARED : 06/15/93
DATE ANALYZED : 06/23/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC
Phenol	F0410/F0411	69	75	8	24 15-112
2-Chlorophenol		73	81	10	29 19-100
4-Chloro-3-methylphenol		79	84	6	35 29-101
4-Nitrophenol		0	82	200	58 10-147
Pentachlorophenol		3	26	159	39 10-112

* = Diluted Out