1-30-003B

SAMPLING AND ANALYSIS PLAN
FOR
REMOVAL ACTION
AT
NAVAL WEAPONS RESERVE INDUSTRIAL PLANT
BETHPAGE, LONG ISLAND

ISSUED:

SEPTEMBER, 1995

PREPARED FOR:

Northern Division
Naval Facilities Engineering Command
10 Industrial Highway
Lester, PA 19113

PREPARED BY:

Foster Wheeler Environmental Corporation
2300 Lincoln Highway
One Oxford Valley - Suite 200
Langhorne, PA 19047-1829

REMEDIAL ACTION CONTRACT N62472-94-D-0398
DELIVERY ORDER NO. 0004

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP)
BETHPAGE, NEW YORK
SAMPLING AND ANALYSIS PLAN

TABLE OF CONTENTS

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP)
BETHPAGE, NEW YORK
SAMPLING AND ANALYSIS PLAN

TABLE OF CONTENTS (Cont'd)

LIST OF TABLES

LIST OF FIGURES

1.0 INTRODUCTION

Presented herein is the Sampling and Analysis Plan (SAP) for the pre-excavation soil sampling to be undertaken by Foster Wheeler Environmental Corporation (Foster Wheeler Environmental) at the Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage, New York. The purpose of the sampling is to define the extent of polychlorinated biphenyl and arsenic contamination at the site and to refine the soil contamination volume estimate for the remedial action. In addition, the sampling will be used as a confirmation of the lack of ancillary contamination. The work is being performed under US Navy Contract N62472-94-D-0398.

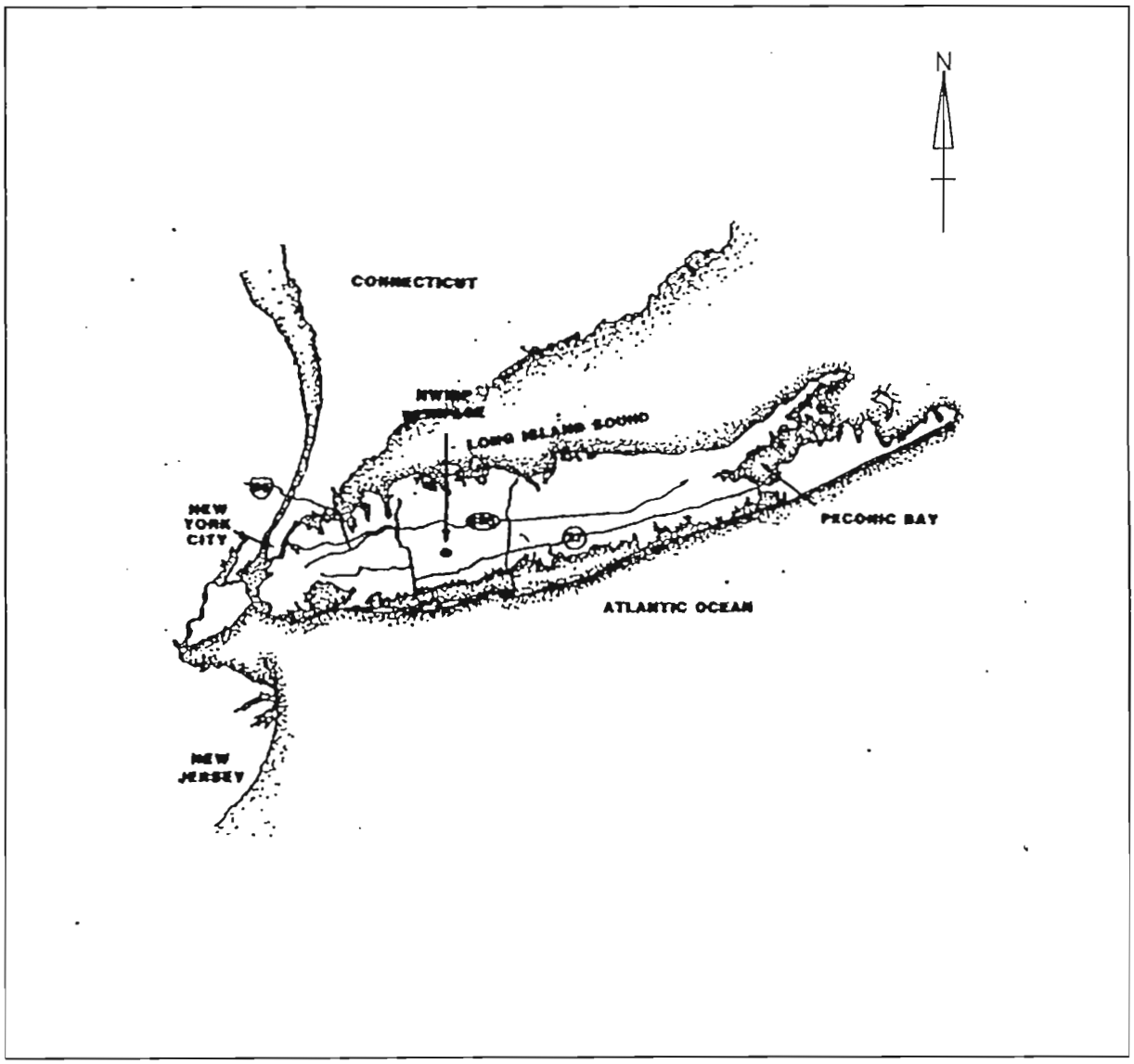
The SAP will present the procedures to be followed during the pre-excavation field investigation activities. Specifically, the SAP addresses:

- Analytical Requirements
- Responsibilities of Site Personnel
- Sample Analytical Program
- Sample Packaging and Shipment
- Documentation
- Field Sampling Program
- Quality Assurance/Quality Control (QA/QC) of Field Sampling
- Procedures for Field Changes and Corrective Actions

The Quality Assurance Project Plan (QAPP), presented in Sections 3.2 and 4, establishes the structure of the quality assurance plan for the field sampling activities. Site-specific Standard Operating Procedures (SOPs) have been generated to describe the sampling procedures (see Section 3.3). Any modifications necessary to these SOPs due to field conditions or other unforeseen situations shall be recorded in the site logbook, documented on the appropriate Field Change Request (FCR) forms by site personnel, and approved by the Senior Project Manager (see Section 4.2).

1.1 SITE LOCATION AND DESCRIPTION

NWIRP Bethpage is a 108-acre site located in Nassau County on Long Island, New York (see Figure 1-1). The site is bordered on the north, west and south by the Grumman Aerospace complex, which covers approximately 605 acres, and on the east by a residential neighborhood. NWIRP Bethpage is currently listed by the New York State Department of Environmental



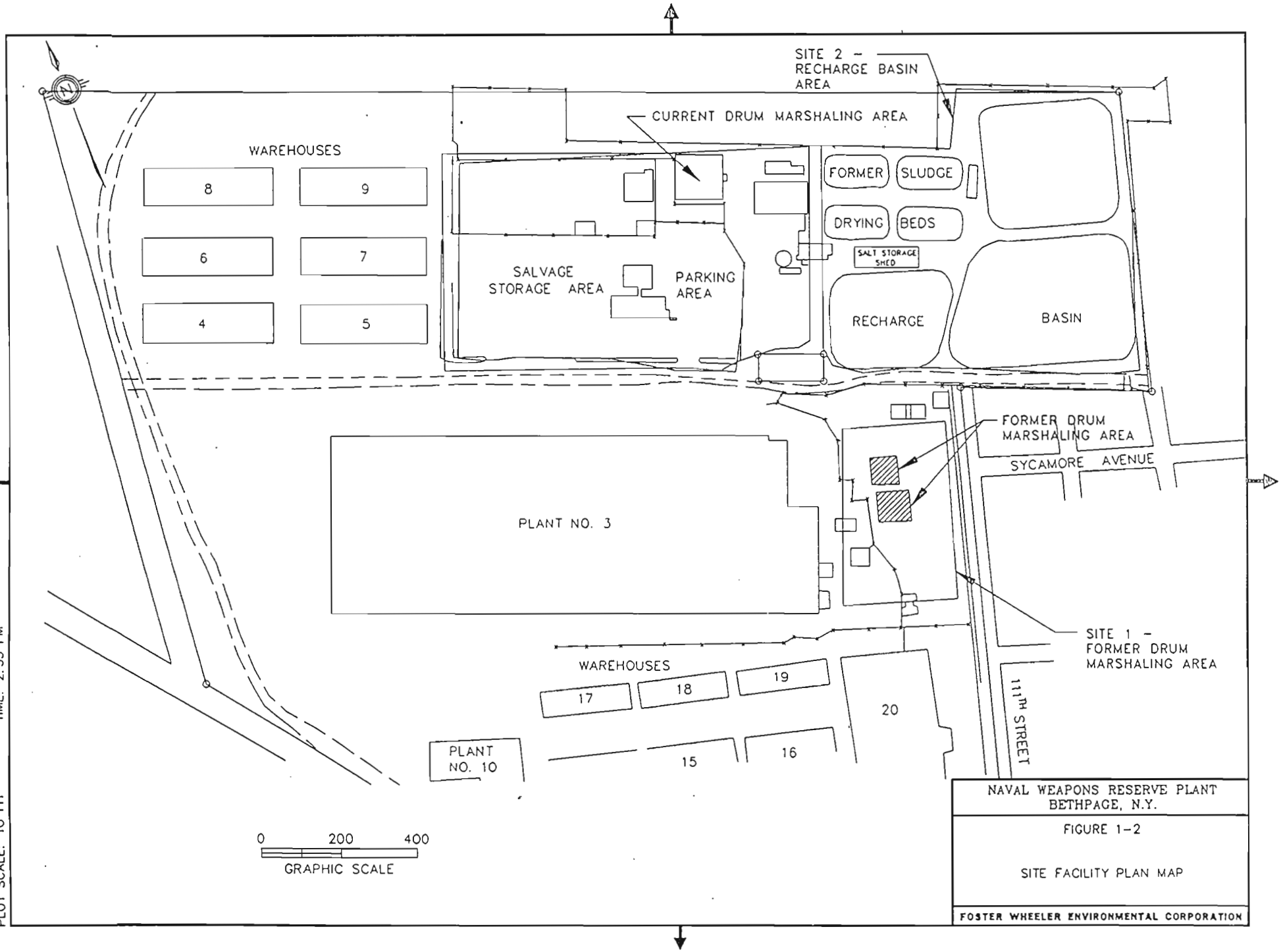
NAVAL WEAPONS RESERVE PLANT
BETHPAGE, N.Y.

FIGURE 1-1

SITE LOCATION MAP

FOSTER WHEELER ENVIRONMENTAL CORPORATION

CAD FILE NAME: FIG1-1.DWG
PLOT FILE: 1=1
DATE: 9/19/95
TIME: 9:55 AM



PLOT SCALE: TO FIT
TIME: 2:35 PM

Conservation (NYSDEC) as an "inactive hazardous waste site" (#1-30-003B) [Halliburton NUS (HNUS), 1995]. The layout of the NWIRP Bethpage facility is shown in Figure 1-2.

1.2 SITE HISTORY

The NWIRP Bethpage plant was established in 1933 and is still active. Since its inception, the primary mission for the facility has been the research prototyping, testing, design engineering, fabrication, and primary assembly of military aircraft.

The facilities at NWIRP Bethpage include four plants, two warehouse complexes (north and south), a salvage storage area, water recharge basins, an industrial wastewater treatment plant, and several smaller support buildings. The four plants are either used for assembly and prototype testing (Plant Nos. 3, 5 and 20) or as quality control laboratories (Plant No. 10).

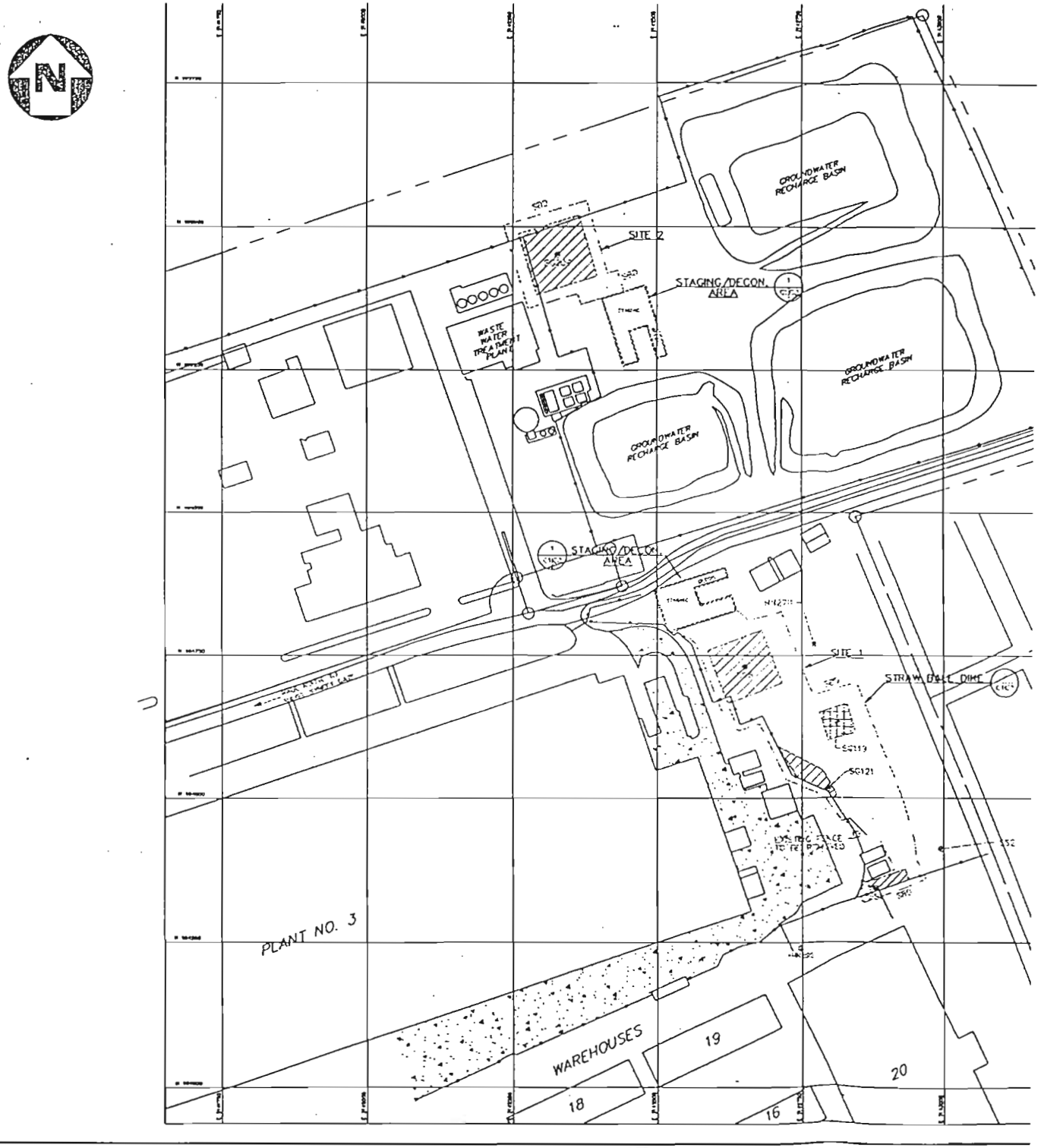
Hazardous waste management practices for Grumman facilities on Long Island included the marshaling of drummed wastes on the NWIRP Bethpage property. Such storage first took place on a cinder-covered surface over the cesspool field, east of Plant No. 3 (see Figure 1-2). In 1978, the collection and marshaling point was moved a few yards south of the original site, to an area on a concrete pad. In 1982, drummed waste storage was transferred to the present Drum Marshaling facility, located in the Salvage Storage Area. Materials stored at the former marshaling areas included waste halogenated and nonhalogenated solvents. In addition, liquid cadmium wastes and cyanide were also reported to be stored in this area [HNUS, 1993].

This SAP covers the pre-excavation soil sampling of Sites 1 and 2 of the facility (see Figure 1-3). A description of each site is presented below.

Site 1 - Former Drum Marshaling Area

Site 1 is located in the middle third of the NWIRP Bethpage facility, and is found east of Plant 3 (see Figure 1-3). It consists of two concrete drum storage pads, which are no longer active, and an abandoned cesspool leach field. The drums of waste marshaled here were reported to contain waste halogenated and nonhalogenated solvents, cadmium, and cyanide. In addition, this area has been used for storage of various types of equipment and heavy materials, including transformers [HNUS, 1993].

Polychlorinated biphenyls (PCBs) were detected in the soils of the former drum marshaling area during the Phase 2 Remedial Investigation (RI) conducted by Halliburton NUS (HNUS).



C:\D FILE NAME: FIG1-2.DWG DATE: 9/19/95
1"=200' TIME: 3:33 PM

Individual PCB concentrations ranged from 0.027 ppm to 1300 ppm, and PCBs were detected in all 8 of the sampling locations. Sampling depths ranged from 0 feet to 5 feet below grade [HNUS, 1993].

Concentrations of arsenic were present in the soils of Site 1 during the initial RI sampling [HNUS, 1993]. Arsenic was detected in 8 of the 9 sampling locations, and was found at a maximum concentration of 3380 ppm in a sample located near the center of the former drum marshaling area (see Figure 1-3 for location of potential arsenic contamination).

Site 2 - Recharge Basin Area

The Site 2 area is located in the northeast corner of the NWIRP Bethpage facility, and is found north of Site 1 (see Figure 1-3). It contains three groundwater recharge basins which currently receive non-contact cooling water. Historically, these basins received rinse waters from Grumman operations. These rinse waters were directly exposed to the industrial processes at the plant, and therefore, they may have contained chemicals used in the rinse process (e.g., halogenated and/or nonhalogenated solvents). In addition, former sludge drying beds have been located within Site 2; these beds no longer exist and have been filled in. Sludge from the Plant 2 industrial waste treatment facility was dewatered in these beds before being disposed of off site.

Soil sampling within Site 2 has shown PCB contamination. During the Phase 2 RI investigation, Aroclor-1248 and Aroclor-1254 were detected here, with individual PCB concentrations ranging from 0.048 ppm (at 0 feet below grade) to 33 ppm (at 3-5 feet below grade). The more elevated levels of PCBs were detected in the former sludge drying beds, in the north-northwestern section of Site 2.

2.0 PROGRAM OBJECTIVES

2.1 DESCRIPTION OF FIELD INVESTIGATION

The field investigation will consist of the following subtasks:

- Mobilization
- Site Survey
- Surface Soil Sampling
- Subsurface Soil Sampling
- Equipment Wipe Sampling
- Demobilization

General site operations and field methodologies will be described in the following sections.

Laboratory analyses of the environmental samples will be conducted in accordance with NYSDEC Analytical Services Protocol-Contract Laboratory Program (ASP-CLP) or US Environmental Protection Agency (EPA) SW-846 methodologies. The soil samples will undergo analyses for polychlorinated biphenyls (PCBs) and Toxicity Characteristic Leaching Procedure (TCLP) arsenic, with twenty percent of the samples undergoing analysis for full Target Compound List (TCL) Organics (volatiles, semi-volatiles and pesticides/PCBs) and Target Analyte List (TAL) Metals. The data will be utilized to delineate the lateral and vertical extent of PCB- and arsenic-contaminated soils in the two site areas (i.e., Sites 1 and 2), and to establish the limits of contamination for remediation purposes. In addition, the TCL/TAL sample data will be used to confirm the lack of ancillary contamination at the NWIRP Bethpage site.

2.2 PERSONNEL RESPONSIBILITIES

The field team will include the following personnel:

The **Senior Project Manager (SM)** has final responsibility for the development of the SAP and management of the project team.

The **Project Chemist** is responsible for assuring that proper collection, packaging, preservation and shipping of samples is performed in accordance with NYSDEC ASP-CLP guidelines. In addition, the project chemist is responsible for coordinating with the subcontractor laboratory

during sample analysis and for reviewing the analytical data received from the subcontractor laboratory.

The **Project Health and Safety Officer (HSO)** is responsible for the safety of all site personnel as detailed in the site-specific Health and Safety Plan (HASP), presented under separate cover.

The **Drilling Subcontractor** is responsible for supplying all services (including labor), equipment, and material required to perform the drilling and testing, in addition to all maintenance and quality control of such equipment. The drilling subcontractor will be responsible for all required drilling permits, licenses, and clearances. The drilling subcontractor will also be responsible for following decontamination procedures specified in the bid package. Upon completion of the work, the drilling subcontractor will be responsible for demobilizing all equipment, cleaning any materials deposited on site during drilling operations, and properly backfilling any borings.

The **Laboratory Subcontractor** is responsible for supplying all services (including labor), equipment and material required to perform the analysis of the environmental field samples. The laboratory subcontractor will be responsible for following all methodology protocols, including quality assurance/quality control (QA/QC) requirements. In addition, the laboratory subcontractor will be responsible for the proper disposal, including all associated costs, of the environmental samples upon completion of the analytical work.

The **Surveying Subcontractor** is responsible for supplying all services (including labor), equipment and material required to perform a detailed site survey. This survey will link the pre-excavation sampling locations to the existing surveys of on-site structural features such as fences, buildings, and paved/unpaved areas.

3.0 FIELD INVESTIGATION ACTIVITIES

This section addresses the field investigation and sampling operations by matrix and type of procedures including:

- sample tracking system
- quality assurance/quality control
- mobilization and demobilization
- site survey
- surface soil sampling
- subsurface soil sampling
- field equipment wipe sampling
- decontamination

3.1 SAMPLE SUMMARY AND TRACKING SYSTEM

3.1.1 Sample Identification System

Each sample will be specifically designated for identification. Sample locations will be identified by a two letter code (i.e., "SB" for soil borings and "WP" for field wipe samples) followed by a two digit number ("01"). The depth in feet of the soil boring sample will be identified after the location information. Environmental field duplicate samples will be identified with a "D" after the depth indicator. For example, the soil sample obtained at soil boring number 3 at a 4 foot depth would be identified as SB-03-4. A duplicate sample taken from this location would be identified as SB-03-4D. A wipe sample collected from the second piece of equipment sampled would be identified as WP-02.

In addition, rinsate blanks, field water blanks and wipe blanks will be collected for quality assurance. These samples will be identified by a two letter code depicting the type of blank, followed by the date the blank sample was collected. The letter codes are "RB" for rinsate blank, "FB" for field water blank, and "WB" for wipe blank. For example, a rinsate blank taken during sampling on September 30, 1995 would be identified as RB-093095.

All location information for the samples will be recorded in the field sampling logbook (see Section 3.1.4).

3.1.2 Sample Analytical Requirements

Analytical testing will be performed by a NYSDEC approved laboratory, following either NYSDEC ASP-CLP and/or SW-846 protocols. All of the soil samples will be analyzed for PCBs and TCLP arsenic, with twenty (20) percent of the soil boring samples being analyzed for full TCL/TAL constituents. The three (3) field equipment wipe samples and one (1) wipe blank will be analyzed for PCBs only. Table 3-1 summarizes the proposed analytical program. Sample collection and analytical protocol information, including sample type, number of samples and duplicates, matrix, sampling device, analytical parameter, sample container requirements, sample preservation, laboratory analysis, method detection limits, and holding times, is presented in Table 3-2.

3.1.3 Sample Packaging and Shipping

Samples will be packaged and shipped according to the applicable method guidelines. Each environmental sample will be properly identified (see Section 3.1.1) and sealed in a polyethylene (PE) bag. The bag shall then be placed in a metal or hard plastic cooler which also has been lined with a large polyethylene bag. Samples shall be packed with sufficient ice (sealed in PE bags) to cool the samples to 4°C. In addition, the cooler shall be filled with enough non-combustible absorbent cushioning material to minimize the possibility of container breakage. The large bag is then sealed, the completed chain-of-custody form is sealed in a PE bag and taped to the underside of the cooler lid, and the cooler container closed. Custody seals and strapping tape shall then be affixed. Copies of the chain-of-custody shipping forms will be retained by Foster Wheeler Environmental.

3.1.4 Sample Documentation

The sampling team or an individual performing a particular sampling activity will be required to maintain a field logbook. This field logbook will be a bound weatherproof notebook that shall be filled out immediately after sampling at the location of sample collection. It shall contain sample particulars including sample number, collection time, location, descriptions, methods used, daily weather conditions, field measurements, name of sampler, and other site-specific observations. It shall also contain (as applicable) any deviations from protocol, visitor's names or community contacts, geologic descriptions, and other site-specific information determined to be noteworthy. The outside cover of the field logbook(s) will be decontaminated, if necessary, using soap swabs such as Handi-wipes.

TABLE 3-1

SUMMARY OF ANALYTICAL PROGRAM
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT, BETHPAGE

Sample Type	PCB Samples [1]	TCLP Arsenic Samples [2]	TCL/TAL Samples [3]
Site 1 Soil Borings:			
Samples	128	128	26
Duplicates	7	7	2
Site 2 Soil Borings:			
Samples	100	100	20
Duplicates	5	5	1
QA/QC [4]:			
Rinsate Blanks	5	--	5
Field Water Blanks	1	--	1
Field Equipment Wipe Blanks	3	--	--
Wipe Blanks	1	--	--
Total Number of Samples:	250	240	55

Notes:

1. PCBs are polychlorinated biphenyls, as specified in SW-846, Method 8080, September 1994.
2. TCLP is the Toxicity Characteristic Leaching Procedure, as specified in SW-846, Method 1311, July 1992.
3. TCL/TAL includes Target Compound List Organics and Target Analyte List Metals, as specified in NYSDEC Analytical Services Protocol, December 1991.
4. The number of QA/QC samples is estimated.

TABLE 3-2

SAMPLE COLLECTION AND ANALYTICAL PROTOCOL INFORMATION
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT, BETHPAGE

Sample Type	Number of Samples [1]	Matrix	Sampling Device	Parameter	Sample Container [2]	Sample Preservation	Analytical Method [3]	Method Detection Limits [4]	Holding Times [5]
Soil Boring	228 (12)	Soil	Split Spoon	PCBs	(1) 8 oz. glass w/ Teflon lined cap	Cool to 4°C	Method 8080 (SW-846)	Compound Specific (33-67 ug/kg)	10 days extract; 40 days analyze
				TCLP Arsenic	(1) 8 oz. glass w/ Teflon lined cap	Cool to 4°C	Extract as per Method 1311; analyze as per Method 7060A (SW-846)	1 mg/L	6 months extract; 6 months analyze
	46 (3)	Soil	Split Spoon	TCL Volatiles	(2) 40 ml VOA vials w/ Teflon line septum	Cool to 4°C	Method 91-1 (ASP-CLP)	Compound Specific (10 ug/kg)	10 days
				TCL Extractables	(1) 8 oz. glass w/ Teflon lined cap	Cool to 4°C	Methods 91-2 & 3 (ASP-CLP)	Compound Specific (1.7-800 ug/kg)	10 days extract; 40 days analyze
				TAL Metals	(1) 8 oz. glass w/ Teflon lined cap	Cool to 4°C	Method CLP-M (ASP-CLP)	Element Specific [6] (0.2-5000 ug/L)	6 months (Hg-26 days)
Rinsate Blank	5	Water	Collected Rinsate	PCBs	(4) 1-L amber glass	Cool to 4°C	Method 8080 (SW-846)	Compound Specific (1-2 ug/L)	7 days extract; 40 days analyze
				TCL Volatiles	(2) 40 ml VOA vials w/ Teflon line septum	HCl to pH<2; Cool to 4°C	Method 91-1 (ASP-CLP)	Compound Specific (10 ug/L)	10 days
				TCL Extractables	(4) 1-L amber glass	Cool to 4°C	Methods 91-2 & 3 (ASP-CLP)	Compound Specific (0.05-25 ug/L)	5 days extract; 40 days analyze
				TAL Metals	(1) 1-L polyethylene	HNO_3 to pH<2; Cool to 4°C	Method CLP-M (ASP-CLP)	Element Specific [6] (0.2-5000 ug/L)	6 months (Hg-26 days)
Field Water Blank	1	Water	Direct Fill	PCBs	(4) 1-L amber glass	Cool to 4°C	Method 8080 (SW-846)	Compound Specific (1-2 ug/L)	7 days extract; 40 days analyze
				TCL Volatiles	(2) 40 ml VOA vials w/ Teflon line septum	HCl to pH<2; Cool to 4°C	Method 91-1 (ASP-CLP)	Compound Specific (10 ug/L)	10 days

TABLE 3-2

SAMPLE COLLECTION AND ANALYTICAL PROTOCOL INFORMATION
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT, BETHPAGE

Sample Type	Number of Samples [1]	Matrix	Sampling Device	Parameter	Sample Container [2]	Sample Preservation	Analytical Method [3]	Method Detection Limits [4]	Holding Times [5]
Field Water Blank Cont'd	1	Water	Direct Fill	TCL Extractables	(4) 1-L amber glass	Cool to 4°C	Methods 91-2 & 3 (ASP-CLP)	Compound Specific (0.05-25 ug/L)	5 days extract; 40 days analyze
				TAL Metals	(1) 1-L polyethylene	HNO_3 to pH<2; Cool to 4°C	Method CLP-M (ASP-CLP)	Element Specific [6] (0.2-5000 ug/L)	6 months (Hg-26 days)
ield Equipment ipe Blanks	3	Wipe	Cotton Swab Pad	PCBs	Cotton swab pad in (1) 8 oz. glass w/ Teflon lined cap	Cool to 4°C	Method 8080 (SW-846)	Compound Specific (1-2 ug/L in extract)	7 days extract; 40 days analyze
Wipe Blank	1	Wipe	Cotton Swab Pad	PCBs	Cotton swab pad in (1) 8 oz. glass w/ Teflon lined cap	Cool to 4°C	Method 8080 (SW-846)	Compound Specific (1-2 ug/L in extract)	7 days extract; 40 days analyze

Notes:

1. The number in parentheses in the "number of samples" column denotes the number of duplicate samples. The number of rinsate and field water blank samples is estimated.

2. The number in parentheses in the "sample container column" denotes the number of containers needed. Double volume is required for matrix spike/matrix spike duplicate analysis of soil samples.

3. Method abbreviations:
   ASP-CLP - NYSDEC Analytical Services Protocol (Contract Laboratory Program), December 1991.
   SW-846 - Test Methods for Evaluating Solid Waste, OSWER, November 1986, revised January 1995.

4. Detection limits for soil samples may vary due to percent moisture. The limits listed for soil are based on wet weight.

5. All holding times listed are from Verified Time of Sample Receipt (VTSR) by the laboratory unless noted otherwise.

6. The detection limits given are the instrument detection limits obtained in pure water that must be met using the procedure in Exhibit E of the ASP-CLP method. Actual detection limits for field samples will be higher.

3.2 QUALITY ASSURANCE/QUALITY CONTROL

This section details the Quality Assurance/Quality Control (QA/QC) sample requirements for all field activities at the NWIRP Bethpage site.

3.2.1 Field Instrument Calibration and Preventive Maintenance

Site personnel will be responsible for assuring that a master calibration/maintenance log will be maintained for each measuring device (Figure 3-1). Each log at a minimum will include the following (as applicable):

- Name of device and/or instrument calibrated
- Device/instrument serial/ID number
- Frequency of calibration
- Date of calibration
- Results of calibration
- Name of person performing calibration
- Identification of calibration gas (HNu, OVA)
- Buffer solutions (pH meter only)

Equipment to be used each day shall be calibrated prior to the commencement of the day's activities and maintained in accordance to manufacturer manual specifications.

Personnel monitoring equipment (HNu PI-101 Organic Vapor Meter and OVA 128 Organic Vapor Analyzer) will be calibrated and maintained in accordance to manufacturer manual specifications. Additional information on personnel monitoring equipment can be found in the site-specific HASP, issued under separate cover.

3.2.2 QA/QC Sample Collection Frequency

Site-specific guidance requirements on the collection of QA/QC samples are listed below.

Rinsate Blanks

A rinsate blank sample will consist of pouring deionized, demonstrated analyte-free water over decontaminated sampling equipment to evaluate potential cross contamination from inadequate

FIGURE 3-1

EQUIPMENT CALIBRATION LOGSHEET

Instrument (Name/Model No./Serial No.): _____

Manufacturer: _____ Date Purchased: _____ Frequency of Calibration: _____

CALIBRATION DATE	INITIAL SETTINGS	STANDARD GAS USED	PROCEDURE	ADJUSTMENTS MADE	FINAL SETTINGS	SIGNATURE	COMMENTS

decontamination. The frequency of rinsate blank collection is one per decontamination event per type of equipment, not to exceed more than one per day. Rinsate blanks will be analyzed for the same parameters as the associated samples. Sampling activities will be scheduled and sufficient equipment will be on hand to minimize the number of rinsate blank samples required.

Rinsate blanks will be taken in accordance to the procedure described below:

1. Decontaminate the sampling equipment using the procedure specified in Section 3.4 of this SAP.

2. Pour deionized water over the sampling equipment and collect the rinsate in the appropriate sample bottles. Volatile organic analysis (VOA) vials are to be filled first (as applicable).

3. Preserve the samples as specified in Table 3-2. Test the resulting pH (as applicable) by pouring a small portion of the sample on broad range pH paper over a collection bowl. Appropriately label each sample container and place the sample in the appropriate cooler for shipment.

4. Complete the necessary sampling paperwork (e.g., sample labels, custody seals, chain-of-custody forms, etc.). Record sample information in the field logbook.

Field Water Blanks

A sample of the deionized water used during the field investigation work will be analyzed at a rate of one per water batch. The field water blank sample will be used to confirm that any source of contamination in the rinsate blanks is not from the deionized water. These samples will be analyzed for the same constituents as the associated environmental samples.

Field Equipment Wipe Blanks

Three (3) field equipment wipe samples will be collected from the sampling equipment after appropriate decontamination has been done (see Section 3.4). These samples will determine potential PCB concentration levels remaining on the equipment. The wipes will be sampled in accordance with the procedures detailed in the SOP presented below.

Wipe Sampling Procedure (SOP #1)

The wipe sampling will be performed by the following procedure:

1. Wear appropriate health and safety equipment as specified in the site-specific HASP.

2. Open decontaminated split-spoon sampling equipment so that the inside section of both halves of the spoon is accessible.

3. Hold the cotton swab pad with a decontaminated stainless steel clamp or tongs, wet with a 1:1 acetone:hexane (pesticide grade) solution, and wipe up and down the inside sections of the split-spoon five times on each half, applying moderate pressure. Wipe the entire area to insure that all of the sample material is collected. A wipe blank (see below) is to be generated by only wetting the cotton swab pad with the same volume of 1:1 acetone:hexane (pesticide grade) solution utilized to collect the wipe samples.

4. Place the cotton swab pad in the designated sample bottle container. Appropriately label each sample container.

5. Place the analytical samples in a sample cooler and chill to 4°C.

6. Complete the necessary sampling paperwork (e.g., sample labels, custody seals, chain-of-custody forms, etc.) for the analytical samples. Record sample information in the field logbook.

Wipe Blank

One (1) wipe blank will be generated by wetting a cotton swab pad with the acetone:hexane solution utilized to collect the wipe samples (see step 3 in SOP #1 above). The wipe blank will be analyzed for the same parameter(s) as the field equipment wipe samples, (i.e., PCBs only).

Duplicate Samples

Duplicate samples will be sent for laboratory analysis to evaluate the reproducibility of the sampling technique used. At a minimum, five percent (i.e., one for every twenty samples) of each unique matrix type will be duplicated.

Matrix Spike/Matrix Spike Duplicate Samples

For the analysis of soil matrix spike/matrix spike duplicate (MS/MSD) samples required in the NYSDEC ASP-CLP methodologies, double sample volume will be collected at a specific location. MS/MSD samples will be collected at a frequency of one per twenty samples (i.e., five percent) or once per week, whichever is more frequent.

3.2.3 Analytical Data Handling, Reporting and Review

Analytical testing of the samples will be performed by a laboratory which is certified by New York State and is a participating member of the NYSDEC ASP-CLP program. The subcontractor laboratory will submit the reported analytical data in both hardcopy and diskette formats.

A limited QA/QC review of the data generated by the laboratory will be performed by the Project Chemist. This will include a review of the sample documentation, analytical data, holding times, and quality control results to ensure that data acceptance criteria were met.

3.3 SAMPLING PROGRAM

3.3.1 Mobilization and Demobilization

This subtask consists of field personnel orientation, equipment mobilization, the staking of sampling locations, and demobilization. Each field team member will attend an on-site orientation meeting to become familiar with the history of the site, health and safety requirements, and field investigation procedures.

Equipment mobilization will entail the ordering, purchase, and if necessary, fabrication of all sampling equipment needed for the field investigation. A complete inventory of available equipment will be conducted prior to initiating field activities. Any additional equipment required will be secured.

Locations for the soil borings will be staked at the start of the site operations. These locations will be measured from existing landmarks, and provisions will be made to accommodate any plant activities.

Equipment will be demobilized at the completion of each phase of field activities as necessary. Equipment demobilization may include (but will not be limited to) sampling equipment and drilling subcontractor equipment.

3.3.2 Site Survey

A survey of the NWIRP Bethpage site will be performed in order to link the pre-excavation sampling locations to the existing site survey map. Horizontal locations will be performed to the nearest foot and ground surface elevations to the nearest 0.10 foot.

3.3.3 Soil Sampling

Approximately 57 soil borings will be advanced on site to investigate the potentially contaminated areas (i.e., Sites 1 and 2). Samples will be taken at 4-foot intervals to a depth of 12 feet at each location (i.e., 4 samples - 0 feet, 4 feet, 8 feet, and 12 feet). Surface soil will be sampled and soil borings will be advanced and sampled in accordance with the procedures detailed in the SOPs presented below. Soil sampling locations are shown on Figure 3-2.

Surface Soil Sampling Procedure (SOP #2)

The surface soil sampling will be performed by the following procedure:

1. Wear appropriate health and safety equipment as specified in the site-specific HASP.

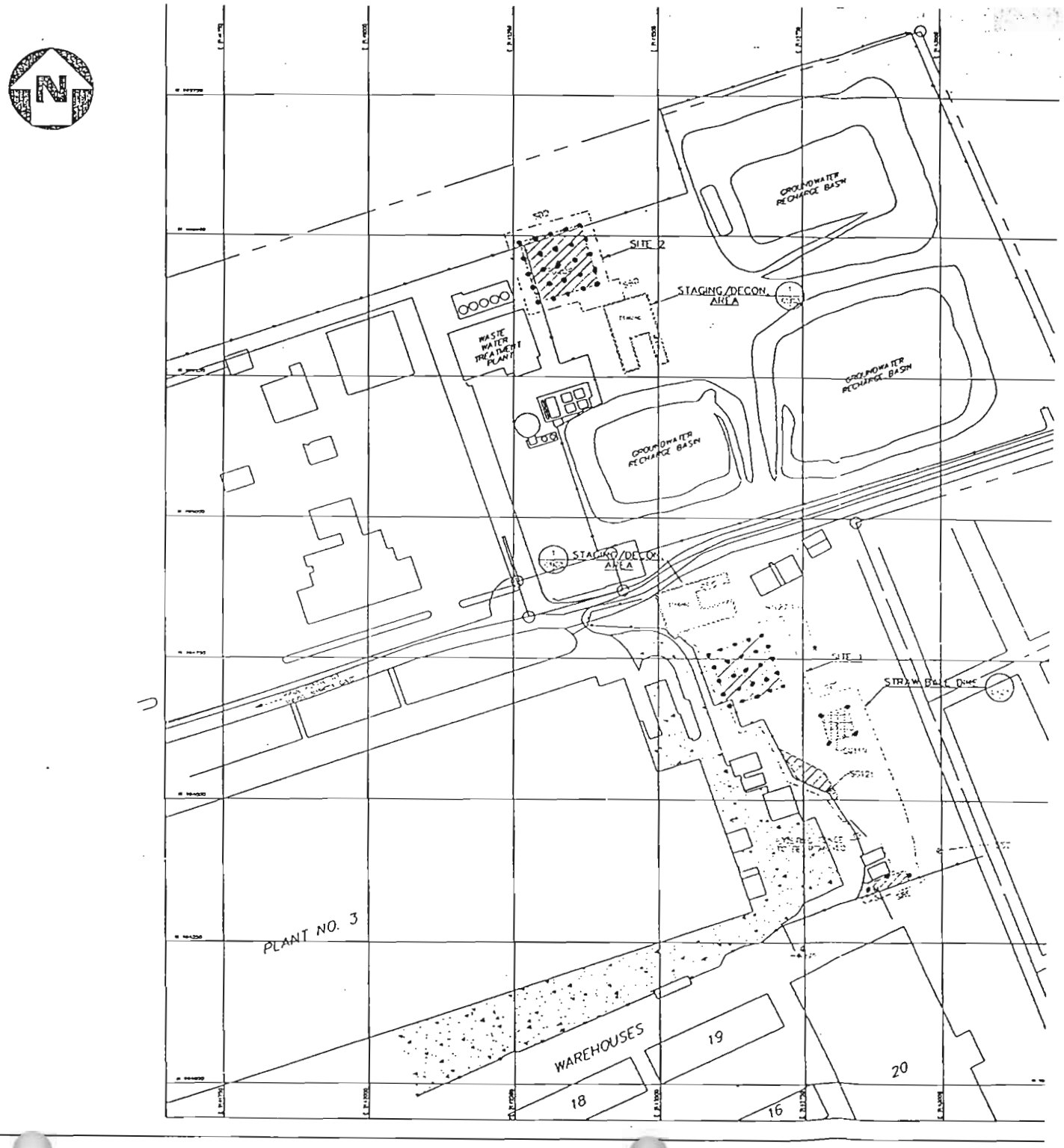
2. Use a decontaminated stainless steel scoop/trowel to scrape away surficial organic material (e.g., grass, leaves, etc.).

3. Once organic materials have been scraped away, scoop the underlying soil from the surface to 6 inches below the surface using the scoop/trowel.

4. Empty the contents of the scoop/trowel into a decontaminated stainless steel bowl or pan.

5. Repeat steps 2 and 3 until enough soil is collected to fill the required sample bottle containers.

6. Fill the sample containers with soil using a stainless steel utensil (e.g., scoop, spatula, spoon, etc.). VOA samples are to be taken as discrete grab samples, and the VOA sample


N
GROUNDWATER RECHARGE BASIN
SITE 2
STAGING/DECON. AREA
WASTE WATER TREATMENT PLANT
GROUNDWATER RECHARGE BASIN
GROUNDWATER RECHARGE BASIN
STAGING/DECON. AREA
SITE 1
STRAW BALE DIKE
PLANT NO. 3
WAREHOUSES
19
20
18
16

bottles should be filled immediately so as to not compromise sample integrity. Soil samples for all other chemical analyses must be homogenized in the bowl/pan with a decontaminated stainless steel utensil prior to placement into the sample containers. Appropriately label each sample container.

7. Place the analytical samples in a sample cooler and chill to 4°C.

8. Complete the necessary sampling paperwork (e.g., sample labels, custody seals, chain-of-custody forms, etc.) for the analytical samples. Record the sample information in the field logbook.

Split-Spoon Sampling Procedure for Soil Borings (SOP #3)

The following procedure will be used for soil boring split-spoon sampling:

1. Wear appropriate health and safety equipment as specified in the site-specific HASP.

2. Drill a borehole to the desired sampling depth.

3. Drive a 2-inch carbon steel split-spoon sampler into the undisturbed soil which is to be sampled. A decontaminated split-spoon sampler will be used for each sample collected for chemical analyses.

4. Bring the sampler to the surface and remove both ends and one half of the split-spoon so that the recovered soil rests in the remaining half of the barrel. Place the split-spoon on clean polyethylene sheeting.

5. Fill the sample containers with soil using stainless steel spatulas or spoons. VOA samples are to be taken as discrete grab samples. These will be taken immediately from the entire length of the split-spoon (as appropriate), and properly packaged. Solid samples for all other chemical analyses must be homogenized in decontaminated stainless steel bowls with stainless steel utensils prior to being put into containers. Appropriately label each sample container.

6. Place the analytical samples in a sample cooler and chill to 4°C.

7. Complete the necessary sampling paperwork (e.g., sample labels, custody seals, chain-of-custody forms, etc.) for the analytical samples. Record sample information in the field logbook.

3.4 DECONTAMINATION

All equipment involved in field investigation activities will be decontaminated prior to and subsequent to sampling. Equipment leaving the site will also be decontaminated as required in the site-specific HASP.

All drilling equipment will be steam cleaned prior to use. Pressurized steam will be used to remove all visible excess material from augers, rods, drill bits, the back of the drilling rig, and other parts of the rig which contact augers, rods, and split-spoons. Steam cleaning will be conducted on the decontamination pad.

Decontamination of the downhole sampling equipment, including split-spoons, scoops/trowels and bailers will be conducted as described below:

1. Alconox detergent and potable water scrub.

2. Potable water rinse.

3. Ten percent (10%) nitric acid rinse (ultra pure grade) when sampling for inorganics. Carbon steel split-spoons (if used) will be rinsed with a one percent (1%) nitric acid solution to avoid stripping of metals.

4. Distilled or potable water rinse.

5. A methanol rinse followed by a hexane rinse (solvents are pesticide grade or better) for equipment involved in the sampling of organics.

6. Air dry.

7. Deionized water rinse.

8. Air dry (sufficient time will be allowed for the equipment to completely dry).

9. Wrap or cover exposed ends with aluminum foil (shiny surface out) for transport and handling.

Decontamination of the sampling equipment will be kept to a minimum in the field, and wherever possible, dedicated sampling equipment will be used. Decontamination fluids and drill cuttings will be stored in DOT-approved 17E or H 55-gallon drums.

Personnel directly involved in equipment decontamination will wear protective clothing, as stated in the site-specific HASP.

4.0 QA/QC VERIFICATION OF FIELD SAMPLING AND PROCEDURES FOR FIELD CHANGES AND CORRECTIVE ACTION

4.1 QA/QC FIELD AUDITS

Quality assurance and quality control during the sampling program will be performed by a Foster Wheeler Environmental QA/QC Officer. The QA/QC Officer will accompany sampling personnel into the field for one or two days to verify that sampling and documentation procedures are being correctly implemented according to the SAP. All findings will be documented to the Senior Project Manager.

4.2 FIELD CHANGES AND CORRECTIVE ACTION

The Senior Project Manager (SM), or his designee, shall be responsible for all site activities. In this role the SM at times is required to adjust the site programs to accommodate site-specific needs. When it becomes necessary to modify a program, the responsible sampling personnel shall notify the SM of the anticipated changes prior to implementing the necessary changes. Any changes will only be implemented upon receiving the SM's concurrence. The SM must consult the Navy Contracting Officer's technical representative ahead of time for major changes to the pre-excavation soil sampling program, and receive his/her approval. If these changes are subsequently determined to be unacceptable, the actions taken during the period of deviation shall be evaluated in order to determine the significance of any departure from established program practices.

The changes in the program shall be documented on a Field Change Request (FCR) which shall be signed by the a member of the sampling team and by the SM. A typical FCR Form utilized to document field changes is shown as Figure 4-1. The FCRs for each document shall be numbered serially starting with the number "01". A copy of the FCR Form shall be attached to the file copy of the SAP by the SM. The SM shall be responsible for the controiling, tracking and implementation of the identified changes.

FIGURE 4-1

FIELD CHANGE REQUEST FORM

Project Name:	Project No.:	Field Change Request No.: FCR-
To:	Location:	Date:

Description:

Reason for Change:

Recommended Disposition:

Name of Requester	Signature of Requester	Date

Disposition:

Name of Site Manager	Signature of Site Manager	Date

REFERENCES

HNUS, 1995. Halliburton NUS, "Final Submission for Remedial Design - Sites 1 and 2, Phase I, Naval Wapons Industrial Reserve Plant (NWIRP), Bethpage, New York," May 1995.

HNUS, 1993. Halliburton NUS, "Phase 2 Remedial Investigation Report for Naval Wapons Industrial Reserve Plant (NWIRP), Bethpage, New York," October 1993.

USEPA, 1985. United States Environmental Protection Agency, "Guidance on Remedial Investigations Under CERCLA," USEPA/540/6-85/002, June 1985.