CLEAN

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NAVAL WEAPONS STATION
CONCORD, CALIFORNIA

SOLID WASTE MANAGEMENT UNIT
SITE INVESTIGATION

DRAFT FINAL FIELD SAMPLING PLAN

VOLUME I

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ABBREVIATIONS AND ACRONYMS

APR	Air Purifying Respirator
ASTM	American Society for Testing and Materials
BAAQMD	Bay Area Air Quality Management District
bgs	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CCCEHD	Contra Costa County Environmental Health Division
CCCSD	Contra Costa County Sanitary District
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cfs	Cubic Feet per Second
CGI	Combustible Gas Indicator
CI	Cast Iron
CLEAN	Comprehensive Long-Term Environmental Action Navy
CLP	Contract Laboratory Program
cm/s	Centimeters per Second
COC	Chain-of-Custody
COPC	Chemicals of Potential Concern
CTO	Contract Task Order
°F	Degrees Fahrenheit
DERA	Defense Environmental Restoration Account
DERP	Defense Environmental Restoration Program
DI	Deionized
DNAPL	Dense Nonaqueous Phase Liquid
DTSC	State of California Department of Toxic Substances Control
EA	Ecological Assessment
EC	Electrical Conductance
E&E	Ecology and Environment, Inc.
EIC	Engineer-in-Charge
EOD	Explosive Ordnance Disposal
EPA	U.S. Environmental Protection Agency
eV	Electron-Volt
FFSRA	Federal Facility Site Remediation Agreement
FM	Fugro-McClelland
FSP	Field Sampling Plan
GPR	Ground Penetrating Radar
HAI	Hageman-Aguiar, Inc.
HLA	Harding Lawson Associates
HPLC	High Performance Liquid Chromatography
HSA	Hollow-Stem Auger
HSP	Health and Safety Plan
IAS	Initial Assessment Study
IRP	Installation Restoration Program
IT	International Technology Corporation
LNAPL	Light Nonaqueous Phase Liquid

ABBREVIATIONS AND ACRONYMS
(Continued)

μg/kg	Micrograms per Kilogram
μg/L	Micrograms per Liter
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
mph	Miles per Hour
msl	Mean Sea Level
NCP	National Contingency Plan
NFA	No Further Action
NIOSH	National Institute for Occupational Safety and Health
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priorities List
OD	Outside Diameter
PCB	Polychlorinated Biphenyls
PID	Photoionization Detector
PPE	Personnel Protective Equipment
ppm	Parts per Million
PRC	PRC Environmental Management, Inc.
PVC	Polyvinyl Chloride
PWC	Public Works Center
QAPjP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
QC	Quality Control
RAC	Remedial Action Contract
RCRA	Resource Conservation and Recovery Act
RES	Riedel Environmental Services
RFA	RCRA Facility Assessment
RI/FS	Remedial Investigation/Feasibility Study
RWQCB	San Francisco Bay Regional Water Quality Control Board
SARA	Superfund Amendments and Reauthorization Act
SI	Site Investigation
SOP	Standard Operating Procedure
SPP	Southern Pacific Pipeline
STLC	Soluble Threshold Limit Concentration
SVOC	Semivolatile Organic Compounds
SWMU	Solid Waste Management Unit
TBT	Tributyltin
TCLP	Toxic Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TOG	Total Oil and Grease
TPH	Total Petroleum Hydrocarbons
TPHd	Total Petroleum Hydrocarbons as Diesel
TPHg	Total Petroleum Hydrocarbons as Gasoline

ABBREVIATIONS AND ACRONYMS
(Continued)

TRPH	Total Recoverable Petroleum Hydrocarbons
TRC	Technical Review Committee
TSD	Treatment, Storage, and Disposal
TTLC	Total Threshold Limit Concentration
UCP	Unglazed Clay Pipe
USA	Underground Service Alert
USC	United States Code
U.S. FWS	U.S. Fish and Wildlife Service
USCS	Unified Soil Classification System
UST	Underground Storage Tank
UTM	Universal Transverse Mercator
VCP	Vitrified Clay Pipe
VOA	Volatile Organic Analysis
VOC	Volatile Organic Compounds
WESTDIV	Western Division, Naval Facilities Engineering Command
WMP	Waste Management Plan
WPNSTA	Naval Weapons Station Concord
WQEC	Weapons Quality Engineering Center

1.0 INTRODUCTION

The Department of the Navy, Western Division, Naval Facilities Engineering Command (WESTDIV) is conducting a site investigation (SI) at 24 solid waste management units (SWMU) at the Naval Weapons Stations (WPNSTA) Concord, California (Figure 1). Of the 24 SWMUs at WPNSTA Concord, 20 are in the Inland Area and 4 are in the Tidal Area of the facility.

WESTDIV has authorized PRC Environmental Management, Inc. (PRC) to develop project plans to support the SI activities at the 24 SWMUs. Contract No. N62474-88-D-5086, Contract Task Order (CTO) No. 0283 calls for the project plans to include a field sampling plan (FSP), quality assurance project plan (QAPjP), and health and safety plan (HSP). This document presents the FSP for the SI activities for 24 SWMU sites at WPNSTA Concord.

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA) established a series of programs for the cleanup of hazardous waste disposal sites and release sites nationwide. One of the programs, the Defense Environmental Restoration Program (DERP), is codified in SARA Section 211 (10 United States Code [USC] 2701). The Navy Installation Restoration Program (IRP) is a component of DERP, and is designed to identify contamination at past potential hazardous waste disposal sites and release sites that resulted from Navy and Marine Corps activities.

A Federal Facilities Site Remediation Agreement (FFSRA) between the Navy and state regulatory agencies was signed on September 29, 1992. The Navy, California Environmental Protection Agency, and the San Francisco Bay Regional Water Quality Control Board (RWQCB) were signatory agents to the FFSRA. The FFSRA for WPNSTA Concord defines in detail the activities and responsible parties involved in the IRP process at the various station sites. These activities will be conducted in cooperation and close coordination with the State of California Department of Toxic Substances Control (DTSC), the U.S. Environmental Protection Agency (EPA) Region 9, the RWQCB, the National Oceanic and Atmospheric Administration (NOAA), the U.S. Fish and Wildlife Service (U.S. FWS) the California Department of Fish and Game, and other interested agencies. The DTSC is the lead agency for the Inland Area at WPNSTA Concord under the FFSRA, and the RWQCB is the lead agency for the Tidal Area under the FFSRA. Among other components of the

FFSRA, all parties agreed to integrate the Navy CERCLA response obligations with the Navy RCRA response obligations to the extent practicable. In May 1994, the Navy provided to the regulatory agencies the revised Appendix C for the FFSRA, which includes the FFSRA schedule for the SWMUs.

Under the RCRA corrective action program, 24 SWMUs were identified in 1992. Five additional SWMUs were identified in March and April 1994. Because of the FFSRA agreement, these SWMUs will be investigated under the Navy CERCLA program. The SI program at WPNSTA Concord supports the Installation Restoration Program (IRP), CERCLA, and SARA because of its potential inclusion in the federal National Priorities List (NPL). This FSP defines the scope of activities to be performed for 24 SWMUs at WPNSTA Concord. The 5 remaining SWMUs are being investigated as part of other programs or projects. Refer to Figures 2 and 3. All 29 SWMUs are listed in Table 1.

1.1 PROJECT OBJECTIVES

The specific objectives of the SI for the 24 SWMUs at WPNSTA Concord are as follows:

- Characterize the geology and hydrogeology underlying the SWMUs
- Identify potential chemical sources.
- Determine the nature of chemicals present in groundwater, soil, surface water, and sediment.
- Determine which SWMUs will require further investigation.

1.2 PROJECT APPROACH

This FSP addresses 24 separate SWMUs, each with different operational histories, environmental conditions, types of chemicals potentially present, and potential exposure pathways and receptors. Nineteen of the SWMU sites were initially addressed as part of the limited scopes of the Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA); one was added in March 1994 and four were added in April 1994. The quantity, quality, and completeness of the available data are insufficient to estimate the nature and extent of chemicals in environmental media in these SWMUs.

Therefore, SI field activities at the SWMUs will be conducted to implement a more detailed and directed program to achieve the objectives stated in Section 1.1. This approach may result in several phases of field work at an SWMU to ensure that the SWMU is adequately characterized. In addition, the variability in potential contaminants and contaminated media at the SWMUs will dictate the use of certain investigative techniques for some SWMUs and not for others. To ensure that all these site-specific features and conditions are addressed, the planned characterization activities related to each SWMU are discussed separately within the relevant sections of this and other associated SI project plans.

Upon completion of the characterization activities outlined in this FSP and the QAPjP, the resulting data will be assessed to determine which of the following actions are appropriate for each site:

- Recommendation of additional characterization for one or several media at the site, prior to proceeding with the baseline human health risk assessment, ecological assessment (EA), and remedial investigation/feasibility study (RI/FS).
- Identification of the need for removal action(s), as defined in 40 CFR 300.415, at one or more sites, if determined necessary to minimize a release or threat of a release that puts human health or the environment at risk. To the extent practical, removal actions will contribute to the efficient performance of any anticipated long-term remedial action.
- Determination for each SWMU whether that SWMU requires no further action or whether it will be included in the IRP or underground storage tank program.

The draft SI report will present the data collected during the field program, as well as the interpretation of the data. This report will be reviewed by the Navy and the appropriate regulatory agencies prior to the issuance of the final report. The sampling and analytical data in the final report will be submitted in electronic format as well as tabular hard copy to the Navy.

2.0 HISTORY OF THE SOLID WASTE MANAGEMENT UNIT PROGRAM

The DTSC previously conducted the RFA (DTSC 1992) investigation into past disposal practices at 49 sites of interest at WPNSTA Concord. The scope of the RFA was developed through review and evaluation of information provided by WPNSTA Concord in response to a questionnaire, as well as other information found in inspection reports and permit applications. A visual site inspection was conducted by DTSC on September 4 and 10, 1991, to obtain additional information and evidence of releases for selected SWMUs. Interviews were also conducted to gather additional information on any initial determinations of releases. Finally, a review of files at other regulatory agencies was conducted as part of the RFA.

The RFA investigation also included sites where non-RCRA regulated wastes (for example, asbestos and waste oil) are managed. The RFA, however, did not evaluate sites being addressed under CERCLA. CERCLA sites have already been identified as potentially contaminated, and investigations under CERCLA are being conducted in coordination with the EPA, DTSC, and RWQCB.

The 49 sites the RFA investigated included 33 Inland Area sites, 15 Tidal Area sites, and a site located at the Radiographic Facility in Pittsburg, California. Table 2 summarizes the past releases and potential for releases at the initial 49 SWMUs, and Table 3 summarizes findings and recommendations for these SWMUs. Of the 49 SWMUs, 25 were recommended for no further action and 24 were recommended for further action. Of the 24 SWMUs recommended for further action, 3 were considered low priority, 13 were considered medium priority, and 8 were considered high priority. WPNSTA Concord is required under the Hazardous Waste Facility Permit (effective July 31, 1993), Section V.A.2, to further investigate these 24 SWMUs. A copy of the permit is included in Appendix A. As stated in Section 1.0, further investigation of these SWMUs is to be performed under the Navy CERCLA response obligations. Any corrective action work will be funded by Defense Environmental Restoration Account (DERA) as directed in permit Section V.A.3.

WPNSTA Concord is also required under the Hazardous Waste Facility Permit (Section V.F.) to notify the DTSC of any newly identified SWMUs. One SWMU, designated SWMU 50, was added during March 1994 after petroleum hydrocarbons were detected in soils during a construction project.

Four additional SWMUs were identified in April 1994 after it was noted that they contained septic tanks that were not addressed in the RFA. Because the possibility exists that hazardous waste was dumped into the septic tank system, these SWMUs were included in the SI and designated as SWMUs 51, 52, 53, and 54.

Five of the 29 SWMUs recommended for further action are being investigated under separate programs, as follows:

- SWMU 8 (building IA-20) is being investigated under the IRP (CTO 250).
- SWMU 26 (building 178) has undergone investigation and remediation under CTOs No. 109 and 238. The site awaits closure approval from Contra Costa County Environmental Health Division (CCCEHD).
- SWMU 30 (UNOCAL Corp.) has undergone investigation and remediation. It awaits closure approval from CCCEHD.
- SWMU 33 (site 6LC98) has been investigated by WPNSTA Concord. It awaits closure approval from CCCEHD.
- SWMU 46 (site E-111) is being investigated under CTO 240.

A discussion of each of these five SWMUs and their current status is presented in Section 4.1. A description of the 24 SWMUs addressed under this FSP is presented in Section 4.2.

3.0 ENVIRONMENTAL SETTING

WPNSTA Concord is the major naval munitions transshipment facility on the West Coast and is located in the north-central portion of Contra Costa County, California, approximately 30 miles northeast of San Francisco. Refer to Figure 1. The facility, which encompasses approximately 13,000 acres, is bounded by Suisun Bay to the north and by the city of Concord to the south and west. Currently, the facility contains three main separate land holdings: the Tidal Area, the Inland Area, and a radiography facility in Pittsburg, California (Figure 4).

The following sections describe the location, land use, climate, physiography and topography, geology, and hydrology of WPNSTA Concord.

3.1 LOCATION

WPNSTA Concord property north of Los Medanos Hills has been designated as the Tidal Area. Refer to Figure 4. The Tidal Area includes 6,077 acres of mainland and six islands in Suisun Bay that total 1,571 acres: Freeman, Roe, Ryer, Snag, and the two unnamed Seal Islands. Two county-owned public roads, Waterfront Road and Port Chicago Highway, traverse the Tidal Area in the vicinity of the former town of Port Chicago. The area is crossed by three railroads and the Contra Costa Canal.

The Inland Area encompasses approximately 5,100 acres between the Los Medanos Hills and the city of Concord (Figure 4). Three public roads cross the Inland Area: State Route 4, Willow Pass Road, and Bailey Road. The northwest section of the base is also crossed by the Contra Costa Canal.

3.2 LAND USE

Land use in the vicinity of the WPNSTA is diverse, characterized by a mixture of industrial, residential, agricultural, and open space zones (Figure 4). WPNSTA Concord is bordered on the south by residential sections of the city of Concord. In addition, seven public schools and several parks parallel the Navy property line. Steep slopes and access problems have prevented extensive development along Kirker Pass Road and in the hills northeast of WPNSTA Concord. These areas are currently zoned for open space and agricultural land use. The Concord Pavilion, a public entertainment facility, is constructed on Kirker Pass Road near the station's boundary.

Land to the north of State Route 4 and to the west of WPNSTA Concord is zoned for industrial development. Several firms have located here, particularly along Port Chicago Highway near the main gate of WPNSTA Concord. Phillips Petroleum Company and Monsanto Chemical Company have facilities along Solano Way near Waterfront Road. The Los Medanos Hills separate the Tidal and Inland Areas and is the site of the Los Medanos underground gas storage field.

The majority of WPNSTA Concord operations take place in the Inland Area. Ammunition storage, which constitutes the largest single land use at WPNSTA Concord, is maintained in five magazine groups and two groups of barricaded railroad sidings. Various production facilities for the inspection and maintenance of ordnance are located throughout the Inland Area.

The majority of the facilities located in the greater Tidal Area are dedicated to ordnance operations and are located on the original property of the Naval Magazine, Port Chicago, acquired by the Navy in 1942. Within the 17,000 linear feet of waterfront are three explosives-handling piers, a barge pier, lighter moorings, and a tug basin. Barricaded rail car sidings, rail car classification yards, and a large unbarricaded holding lot for trucks are inland from the waterfront area and approximately 1,000 feet east of the Tidal Area Landfill site. There are several open inert storage and parking aprons associated with the piers and support activities.

3.3 CLIMATOLOGY

Contra Costa County normally experiences dry, warm summers and moderately rainy winters. The wind blows from southwest to west-northwest at a mean wind speed of 12 miles per hour (mph) 65 percent of the time. The average local temperature varies from 45 °F in January to 75 °F in August.

The mean annual precipitation for WPNSTA Concord is 14 inches (E&E 1983). As in most of northern California, about 84 percent of the rainfall occurs from November through March. Regionally, rainfall may vary from 13 inches in the eastern portion of Contra Costa County to over 30 inches on the upper slopes of Mt. Diablo.

3.4 PHYSIOGRAPHY AND TOPOGRAPHY

The physiography and topography of the Tidal Area is shown on Figure 5. Originally, the Tidal Area consisted of three distinct land formations: salt wetlands along the shore of Suisun Bay, the upland colluvial slope, and the sandstone hills farthest from the water. A large section of the wetlands was modified when the original WPNSTA was constructed by the addition of large amounts of fill material. Almost all existing naval facilities were built in these filled areas (IT 1992). The colluvial slope is the most suitable for development because of its higher elevation and gentler slope. The area to the south of the Contra Costa Canal is characterized by steeply sloping terrain, beginning at a 100-foot elevation and rising to more than 600 feet. The hills are composed of soft sandstone which erodes easily, making it poorly suited for construction.

The physiography and topography of the Inland Area is shown in Figure 6. Most of the western half of the Inland Area is characterized by gently sloping land designated as colluvial slope. Steeply sloping terrain, beginning at 100 feet mean sea level (msl) and rising to over 800 feet msl, forms the northeast boundary of the Inland Area. These hills are composed of soft sandstone which erodes easily, making it poorly suited for construction.

3.5 GEOLOGY

The regional geologic features are a reflection of several northwest-trending fault systems that divide Contra Costa County into large blocks of rocks. Up-thrown blocks form the hills and down-thrown blocks form broad lowlands floored with thick, unconsolidated Pleistocene-age alluvial sediments eroded from the up-thrown blocks. Figure 7 is a geologic map of WPNSTA Concord with a cross section of the major geologic formations. The uplifted bedrock feature that topographically separates the Inland and Tidal Areas is typical of the geology of Contra Costa County.

Figure 7 shows the two major faults known to exist in the WPNSTA Concord area. The Concord Fault passes through the city of Concord at a distance of approximately 2 miles from WPNSTA Concord. The Concord Fault is classified as active and is classified as a right-lateral strike-slip fault. The main trace of the Clayton Fault lies at the base of Los Medanos Hills in passing through WPNSTA Concord. The Clayton Fault is classified as active or potentially active.

Tidal Area geology is dominated by Pleistocene and Holocene geomorphology. Subsurface geology is best described as a zone of interfingering alluvial and estuarine depositional environments. The Tidal Area can be divided into three distinct landforms, all of Quaternary age: footslopes, floodplains, and marsh or wetland areas.

Alluvium in inland areas consists of beds of sandy, silty, and clayey soils. Silty soils appear to predominate. A 3-foot-thick layer of dark brown or gray, clayey residual soil is consistently present on the alluvium throughout the region.

Soils in the north-central portions of WPNSTA Concord are clay-rich alluvium derived from nearby hills. They are well sorted, pebbly alluvium from upstream areas of Mt. Diablo Creek. Soils in the central area tend to be coarser at shallow depths but grade comparatively finer than soils in the north-central area.

3.6 HYDROLOGY

The hydrology of the region can be separated into surface water and groundwater. Surface water hydrology is concerned with the streams, lakes, bays, and estuaries.

3.6.1 Surface Water

WPNSTA Concord is located in the Sacramento-San Joaquin Delta area. Three natural surface water bodies are located within or adjacent to the Tidal Area at WPNSTA Concord: Suisun Bay, Hasting Slough, and Bellow Slough (Figure 5). A drainage canal known as Otter Sluice has been constructed west of the Tidal Area SWMUs. This sluice empties into Suisun Bay north of the R Area Disposal site.

WPNSTA Concord lies within the Mt. Diablo-Seal Creek Watershed, which drains an area of about 36 square miles. The watershed is bounded on the south by the north peak of Mt. Diablo and on the north by Suisun Bay. Streams that drain the watershed have their headwaters on the slopes of Mt. Diablo and flow by way of Mt. Diablo Creek through Clayton Valley and WPNSTA Concord to the outlet at Suisun Bay. Mt. Diablo Creek is referred to as Seal Creek where it enters WPNSTA Concord.

3.6.2 Groundwater

Groundwater beneath the Tidal Area generally flows to the west/southwest with a gradient of approximately 0.002. The R Area Disposal site groundwater was reported to flow to the east with a gradient of approximately 0.003 (Figure 8). IT Corporation (IT) found the groundwater gradient at the Froid and Taylor Roads site to be approximately 0.003 and to flow in a west/southwest direction. Groundwater beneath the Wood Hogger site flows north, with an average gradient of approximately 0.003. Groundwater flows to an area central to the Tidal Area sites.

In November 1991, rising head aquifer tests (slug tests) were performed on several selected Tidal Area monitoring wells. Results from the slug tests indicate that the Tidal Area as a whole has an average hydraulic conductivity of 1.86×10^{-5} centimeters/second (cm/s), with the highest conductivity occurring at well FTW-5 (1.16×10^{-4} cm/s) and the lowest at well RDW-5 (2.05×10^{-6} cm/s) (IT 1992).

Most of the Bay Area's water is supplied by treated surface water sources, although, some wells in the vicinity of the Mallard Reservoir (Figure 9) are still used for water supply. Groundwater is available beneath the Inland Area in the unconsolidated formations and the bedrock. North of State Route 4, the water table ranges from 30 to 40 feet bgs in low surface elevation areas and at deeper depths as ground surface rises. In the main industrial complex of the Inland Area, groundwater is at a depth of approximately 20 feet bgs.

4.0 SITE DESCRIPTIONS, PAST OPERATIONS, AND PREVIOUS INVESTIGATIONS

This section presents the physical description and history of operations at each site to be investigated during the SI at WPNSTA Concord, as well as the results of previous environmental investigations, including the RFA and the Initial Assessment Study (IAS). The 5 SWMUs to be addressed under other programs are also described in this section. The proposed field program for the collection of environmental samples is described in Section 5.0.

Documents and aerial photographs were reviewed as part of the project plans preparation. PRC studied 25 aerial photographs taken from 1952 to 1986 to verify existing features and any changes that may have occurred at each SWMU. PRC representatives visited the SWMUs on February 28 and March 8, 1994. During the site visits, site features were noted and soil sampling locations selected. A site visit was also conducted on May 11, 1994 with representatives from regulatory agencies.

4.1 SWMUS BEING INVESTIGATED UNDER OTHER PROGRAMS

Twenty-four SWMUs inspected during the RFA were included in the list of SWMUs to be investigated under the SI. Five of these SWMUs (SWMUs 8, 26, 30, 33, and 46) are being investigated under other programs and will not be investigated under the SI. A summary is presented below of the previous investigations and the present status of these five SWMUs.

SWMU 8 - Building IA-20

Building IA-20 is a chemical and materials testing laboratory for oil and hydraulic fluids for guided missiles. It is also used in the development of test methods for new weapons. The laboratory evaluates the structural integrity and dynamics of ordnance casings, shells, and missiles.

In the past, some wastes from the laboratory were disposed of on surrounding property. Between 1964 and 1968 wastes containing chlorofluorocarbon-113 was periodically disposed of onto soil behind building IA-20 at a rate of about 1 gallon per week. In 1968, the practice was stopped when the material was found to be hazardous. The soil has since been excavated and disposed of. The chemical laboratory occasionally generates varying quantities of explosive wastes. In the past, these wastes were combined with similar wastes from the Ordnance Department, contained, and dumped in the ocean until that practice was outlawed in the early 1970s. Now, the material is collected per WPNSTA Concord RCRA permit and disposed of off base. The land behind building IA-20 is a site being investigated under the IRP. Information can be found in the draft site investigation report (PRC/Montgomery Watson 1993).

SWMU 26 - Building 178 (Navy Exchange Gasoline Service Station)

Building 178, the Navy Exchange Gasoline Service Station, was used to provide automotive service and repair for active and retired eligible military service customers. The station ceased operations in 1991 and is now the recycling center. Used oil, oil filters, and oily rags were some of the wastes generated. A grease and sand trap (Sump Container No. 178E) inside the building was closed and permanently covered with concrete. The records show that it was installed in 1969 to receive drainage from the automotive repair area.

Three underground storage tanks (UST) located on the north side of the service station were discovered to be leaking in 1990. The contents of the tanks were removed, and the three USTs were removed during October 1991 under the permit issued by the CCCEHD. Soil contamination was detected to a depth of 22 feet below ground surface (bgs).

During September and October 1993, additional piping and one dispenser island were removed. Soil contamination was detected and soil was removed until nondetectable levels were reached. Three monitoring wells and six soil borings were installed. Analytical results indicated that one groundwater and one soil sample had detectable concentrations of petroleum hydrocarbons. A report (PRC 1994) summarizing the investigation findings was submitted for review. The site was recommended for closure. WPNSTA Concord is now awaiting approval for site closure from CCCEHD.

SWMU 30 - UNOCAL Corporation Oil Pipeline Site

UNOCAL has an easement for a pipeline across the naval base. This pipeline traverses the base in an east-west direction, crossing under the Contra Costa Canal. Immediately south and parallel to the pipeline are two other pipelines: one owned by Southern Pacific Pipeline (SPP) and the other by Texaco U.S.A. (Texaco).

During the installation of cathodic protection in November 1989, the UNOCAL Corporation pipeline had a release of crude oil onto WPNSTA Concord property. A hole was inadvertently ground into the side of the pipeline at a site adjacent to the west side of the canal. An estimated 2 to 3 barrels of crude oil were accidentally released onto the ground owned by WPNSTA Concord.

UNOCAL performed some excavation in November 1989 to remove soils contaminated with hydrocarbons. Preliminary excavation work revealed that the contaminated soils were present on the east and west sides of the canal. Excavation activities ceased and a subsurface assessment was conducted to evaluate further corrective action options.

UNOCAL contracted with Groundwater Technology, Inc., to assess the extent of contamination. In March 1990, monitoring wells were drilled. Analysis of groundwater samples showed a total petroleum hydrocarbon as gasoline (TPHg) and benzene concentrations of 4,300 micrograms per liter (μg/L) and 270 μg/L respectively. The data indicated that the vadose-zone soils and groundwater had been contaminated. Contamination extended at least 60 feet to the northwest of the release. The extent of the contamination on the east side of the canal appeared to be confined to a 15-foot diameter.

UNOCAL presented a remedial action plan to the RWQCB and the CCCEHD. About 1,900 cubic yards of contaminated soil were excavated and the pipeline was repaired. About 1,460 cubic yards of soil contaminated with less than 100 parts per million (ppm) total petroleum hydrocarbons (TPH) was disposed of in a Class III landfill at Forward Incorporated Facilities in Stockton, California. The soil containing greater than 100 ppm TPH was excavated to a depth of approximately 2 feet below the water table. There is still an area with petroleum hydrocarbons greater than the 100 ppm cleanup objectives in the area near the canal that could not be excavated.

Quarterly monitoring and sampling reports at this UNOCAL pipeline location were submitted by UNOCAL to the RWQCB. A closure report (UNOCAL 1991) was prepared and submitted to the RWQCB and CCCEHD. UNOCAL is still awaiting approval for site closure.

SWMU 33 - Site 6LC98, Underground Storage Tank

Building 6LC98 houses the steam boiler that provided heating in the Magazine Building. Records show that a nearby UST was installed in 1957 to store diesel fuel oil for this boiler.

In November 1990, diesel fuel oil contamination was discovered while Minter and Fahy Construction Company was removing abandoned USTs. In January 1991, the UST at site 6LC98 was removed under the direction of the CCCEHD. On November 13, 1991, H & H Environmental Services issued a tank disposal certificate to Minter & Fahy. The certificate stated that the tank was transported to H & H Environmental Services, steam cleaned, rendered harmless, and disposed of as scrap metal to Schnitzer Steel, Oakland, California.

Hageman-Aguiar, Inc. (HAI) was contracted to conduct a limited soil sampling investigation at site 6LC98. Investigation results showed up to 140 milligrams per kilogram (mg/kg) total petroleum hydrocarbons as diesel (TPHd) remaining in the soil immediately adjacent to this tank. Soil sampling data indicated that no significant lateral migration of petroleum constituents had occurred. Due to subsurface contamination, HAI recommended remedial action at site 6LC98.

Soils were excavated during January 1994 under the supervision of CCCEHD. Analytical results from soil samples along the north, west, and south walls of the excavation all indicated no total recoverable petroleum hydrocarbons (TRPH) in the soil at detection limits of 1.0 mg/kg. A soil sample from the bottom of the excavation also indicated no TRPH at detection limits. WPNSTA Concord is awaiting final closure approval from CCCEHD.

SWMU 46 - Site E-111 - Heating Plant

Building E-111 houses a steam boiler that provides heating to Tidal Area buildings. Diesel fuel oil used to fuel the boilers was stored in a nearby UST installed in 1945.

On November 15, 1990, the UST at site E-111 was removed by Minter and Fahy Construction Company and the hole was backfilled. The soil was found to have diesel fuel oil contamination. Analysis of the water from the tank excavation showed a TPHd concentration of 2,500 milligrams per liter (mg/L). Due to subsurface contamination, remedial action at site E-111 was recommended.

PRC is now investigating this SWMU under a separate action (CTO 240). The work plan (PRC 1993) has been prepared and was submitted to the DTSC for review.

4.2 SWMUS BEING INVESTIGATED UNDER THE SI

The following sections provide site descriptions, operational histories, and summaries of previous investigations for the 24 SWMUs to be investigated under the SI. The information on previous investigations is presented to assist in describing potential impacts from site activities and does not present any interpretation of data.

4.2.1 SWMU 1 - Building IA-6

This section provides the site description and summary of previous investigations for SWMU 1. Figure 10 shows the location of building IA-6 and other features. Table 4 presents the results of the previous soil and groundwater investigations at building IA-6.

Site Description

Building IA-6, constructed in the 1940s, is approximately 3/4 mile east of the main entrance and on the south side of Kinne Boulevard. The building is a boiler house which supplies heat to several structures in the Inland Area. It houses three steam boilers used for heating administrative and shop buildings. Two of the 3 boilers were configured to fire natural gas; the third boiler was configured to fire diesel fuel oil in case of loss of natural gas supply. All three boilers could use diesel fuel supplied from a 10,000-gallon capacity UST if the proper burner nozzles were installed. The UST, about 15 feet south of building IA-6, was removed in 1989. The natural gas boilers were the normal operating boilers.

The boilers are constructed of red brick with either an asbestos or steel interior lining. piping leading to and from the boilers are insulated with asbestos containing material (ACM). Chemicals frequently added to boiler water were sodium hydroxide, sodium carbonate, sodium sulfite, sodium phosphates, and sodium nitrate.

The ground surface in the vicinity of building IA-6 generally slopes to the southwest, and has an elevation of approximately 48 feet msl. Seal Creek, an intermittent stream, runs southwest of the site. The area south and west of building IA-6 is generally surrounded by unpaved open space with the exception of building IA-4 and the electric substation. The area to the east is a paved driveway and parking area. A gravel driveway intersecting Kinne Boulevard is along the south and west sides of building IA-6.

Groundwater flow is in a northwest direction, approximately paralleling Kinne Boulevard. The groundwater gradient is approximately 0.03 feet per foot. This is based on water levels collected during investigations conducted in 1993.

Along the west side of the building, a grease and sand trap prevents oil and debris from entering the sanitary sewer system. This trap is inspected and cleaned every 3 months as required by the wastewater discharge permit from the Contra Costa County Sanitary District (CCCSD).

A 6-inch-diameter pipe was noted at the bottom of a 1-foot-deep hole in the ground located about 4 feet north of the grease and sand trap. An area approximately 10- by 20-feet was saturated, and ponded water was noted adjacent to the gravel road that crosses the west side of building IA-6. A visit to the SWMU on April 13, 1994, revealed that grass was distressed in the area which had been saturated. The source of the water is believed to be boiler purge water which leaked from a broken line leading to the purge water holding tank. While being operated, the boilers were purged after each shift. The boilers were taken out of service during 1994.

Previous Investigations

In September 1987, water entered the UST through an open manway access while the lid was being removed for repairs, causing the UST to overflow. An estimated 1,900 gallons of diesel fuel was reportedly released from the UST. Following the fuel release, Riedel Environmental Services (RES) conducted an environmental assessment. Trenches were excavated in December 1987. In April 1988, RES installed monitoring well MW-1.

RES removed the UST in June 1989. About 80 cubic yards of contaminated soil was excavated. At the time of UST removal, a soil sample collected from the west side of the UST excavation pit indicated the presence of TPHd. TPHd was not detected from the east side of the UST excavation pit (Fugro-McClelland [FM] 1993). Diesel fuel was detected in groundwater.

Following removal of the UST, monitoring wells MW-2 and MW-3 were installed by RES in July 1989. In September 1990, PRC installed monitoring well MW-4. On September 16, 1990, PRC collected groundwater samples from monitoring wells MW-1, MW-2, MW-3, and MW-4. Results indicated 1.5 inches of floating product in MW-1. TPHd was detected in monitoring wells MW-2 and MW-4. PRC sampled the four wells again on November 15, 1990, to confirm the contaminants present. TPHd was detected in MW-1, and no petroleum hydrocarbons were detected in MW-2, MW-3, or MW-4.

FM sampled the monitoring wells on August 12, 1992. Floating product was observed in MW-1. No TPHd or TPHg were detected in any of the other three monitoring wells. FM sampled the monitoring wells again on April 4, 1993. MW-1 was not accessible; and groundwater samples from MW-2, MW-3, and MW-4 indicated no presence of TPHd and benzene, toluene, ethylbenzene, and xylenes (BTEX). Analytical results did confirm the presence of halogenated volatile organic compounds (VOC) in each of the groundwater samples.

On September 2 and 3, 1993, FM drilled soil borings MW-5 and MW-6 to depths of 30, 25, 25, and 30 feet, respectively. Soil borings MW-5 and MW-6 were completed as monitoring wells. Groundwater samples were collected from monitoring wells MW-2, MW-3, MW-4, MW-5, and MW-6. Groundwater in monitoring well MW-1 was not sampled because a thin film of floating product was observed. No TPHd or BTEX was detected in any of the monitoring wells that were sampled. Tetrachloroethene was detected in all monitoring wells. At monitoring well MW-5, chloroform, 1,1-dichloroethene, and trichloroethene were detected. TPHd was detected in soil samples from MW-5 at 10 feet.

FM later prepared the soil excavation and removal design plan to remove an estimated 100 tons of diesel-contaminated soil (refer to Figure 10). The soil remediation will be followed by groundwater remediation, for which FM will provide remediation alternatives. Soil and groundwater remediation will be completed under the WESTDIV remedial action contract (RAC) using DERA funds.

4.2.2 SWMU 2 - Building IA-7

This section provides the site description for SWMU 2. Figure 11 shows the locations of building IA-7 and other features.

Building IA-7, constructed in the 1940s, is about 1/2 mile south of the main entrance, on the west side of Kinne Boulevard, and is a fire station for the Inland Area. Between 1969 and 1973, fire-fighting training activities were conducted twice a year in a shallow pit located south of the fire station. Fuel oil and napalm were used in the practice burns. Extinguisher chemicals used included potassium chloride, sodium chloride, ammonium phosphate, and potassium carbonate. Between 1969 and 1973, residues of these chemicals were scraped off the ground and disposed of in the Seal Creek bed (usually dry) which runs just south of the fire station. Since 1973, practice burns were conducted in shallow metal pans. Chemical residues contained in the pans were disposed of at approved sites.

Two storage facilities, building 114 and building 416, are located to the south. The area south of building 114 slopes gradually toward Seal Creek which is about 200 feet to the south. This area is overgrown with grass and trees.

The area east of building IA-7 is paved and used for parking vehicles. The parking area extends 300 feet east and approximately 200 feet to the south. Aerial photographs show that during the period from 1976 to 1986 the parking area was being expanded to the south. The 1976 aerial photograph shows the parking lot boundary to extend from building IA-7 east to building IA-8. The area to the south of the parking lot appears in the photograph to have been partially backfilled. The present parking lot extends 150 feet south of building IA-7.

A storm drain is 50 feet east of building IA-7 and drains into the drainage ditch about 100 feet south. The drainage ditch flows to the south into Seal Creek. This drainage was not present in the 1957 aerial photograph and the storm drain may not have been in place then. Aerial photographs from 1969 show that the storm drain may have been installed during the period from 1957 to 1969. The aerial photograph from 1986 shows that the drainage from the storm drain outfall shifted slightly to the west when the parking lot was expanded to the south. Adjacent to the storm drain outfall is one of the satellite accumulation points for hazardous waste. The hazardous waste is held in drums in a yellow metal shed until delivery to the hazardous waste storage facility at building 433.

4.2.3 SWMU 5 - Building IA-12

This section provides the site description for SWMU 5. Figure 12 shows the locations of building IA-12 and other features.

Building IA-12, constructed in the early 1940s, is in the main industrial complex of WPNSTA Concord, approximately 1 mile east of the main entrance and north of Kinne Boulevard. The building houses the locomotive repair shop where the maintenance of approximately 1,100 pieces of railway, automotive, construction, and weight-handling equipment was conducted.

Battery maintenance and recharging was done at the northeast corner of building IA-12. Water was added to batteries that were low in liquid. This procedure was discontinued in early 1992. Batteries, which are recycled, are stored on the north side of building IA-12. This area serves as a satellite accumulation point for these batteries. Approximately 49 automotive batteries are recycled annually. Approximately 24 locomotive batteries have also been recycled from this facility in the past 5 years. Battery acids from automotive and locomotive batteries are drained into a 5-gallon carboy, which is then delivered to Mare Island Naval Ship Yard for recycling. The outside of the battery casings are rinsed and neutralized prior to recycling. A grease and sand trap is located along the northwest interior wall of building IA-12.

Waste is generated and accumulated at various locations around building IA-12. A locomotive and rail car steam cleaning pad is approximately 59 feet west of building IA-12. Wash water from the washdown pad is collected from the north and west side of the pad. Records show that the pad was installed in 1976 to collect oily wastes into an oil/water separator through a 6-inch-diameter vitrified clay pipe (VCP) drain line. The oil/water separator, about 5 feet west of the washdown pad, is a single-walled, 6-inch-thick concrete sump with a 200-gallon capacity. It is about 4 feet wide, 9 feet long, and 7 feet deep. The oil/water separator is also known as Sump Container No. IA-12B. It is periodically cleaned by a contractor who pumps the oil to a vacuum truck. The water from the oil separator is drained into a manhole through 6-inch-diameter VCP about 190 feet west of the oil separator. The water is then discharged to the sewer system with the approval of the CCCSD.

A diesel fuel transfer pump is at the northwest corner of building IA-12. The dispenser is connected to a 10,000-gallon UST located about 50 feet north of the dispenser. The UST was built in 1944 and is about 50 feet north of building IA-12.

A 500-gallon capacity waste oil UST was located along the south side of building IA-12. It was used to store waste oil generated from locomotives. A sink on the outside platform delivered the waste oil to the UST. The UST was removed during 1993 as part of a RCRA closure.

During the site visits, it was noted that the asphalt was stained along the northeast wall. An area approximately 3 by 10 feet along the southeast wall was noted to be stained with petroleum hydrocarbons. Staining was observed around the diesel fuel transfer pump. Drums filled with motor oil were next to a platform at the southeast corner.

4.2.4 SWMU 7 - Building IA-16

This section provides the site description for SWMU 7. Figure 13 shows the locations of building IA-16 and other features.

Building IA-16, constructed in the 1940s, is in the main industrial complex of WPNSTA Concord, approximately 1 mile east of the main entrance and north of Kinne Boulevard. About 20 painters worked out of building IA-16 in the years before 1960. They were responsible for interior and exterior painting of base buildings. Much of the paint was oil based and much of the exterior paint was lead based. Prior to the 1970s, all waste paint, thinners, cans, and the like were likely disposed of in the Tidal Area Landfill. Paint usage was estimated at 700 gallons per year, generating approximately three drums of solid waste per year. By the early 1960s, the paint shop crew was reduced to three painters responsible for touch-up and repair work and minor interior finishing.

Major finishing jobs are now performed by contractors who are responsible for cleanup and disposal of their materials.

Four USTs are located beneath the paved area between buildings IA-12 and IA-16 (two 10,000-gallon gasoline USTs and two 10,000-gallon diesel fuel USTs). Three of the USTs are located adjacent to the southeast corner of building IA-16 and supply fuel to a gas station 60 feet southeast of building IA-6. The fourth UST supplies diesel fuel to the fuel dispenser at the northwest corner of building IA-12. Leak tests of USTs were done annually and reported to CCCEHD. Routine level and volume checks of the USTs are made by station personnel. No leaks have ever been detected in the USTs. Small spills (1 to 2 gallons) have occasionally occurred on the concrete and asphalt surfaces in the vicinity of the tanks. These spills were confined to the immediate area of the asphalt pad where they were contained and cleaned up.

Inside building IA-16 is a paint shop with a paint locker. A satellite accumulation area for waste paints and thinners is near the storage shed at the back of the building. Leftover paint from 1- and 5-gallon cans is drained into a 55-gallon drum. Empty paint cans are allowed to dry and then are disposed of as nonhazardous waste at a municipal trash bin.

During the site visit, asphalt in a 10- by 40-foot area along the northeast wall was observed to be cracked and stained with paint. Some paint staining was observed around the paint locker.

4.2.5 SWMU 12 - Building IA-24

This section provides the site description and summary of previous investigations for SWMU 12. Figure 14 shows the locations of building IA-24 and other features. Table 4 presents the analytical results from previous soil and groundwater investigations and Table 5 presents the analytical results of the septic tank investigations at building IA-24.

Site Description

Building IA-24, constructed in the 1940s, is 60 feet north of Kinne Boulevard, approximately 3 miles from the front gate. Maintenance of forklift equipment is done at building IA-24. Some of the hazardous wastes generated are used oil, absorbent materials soaked with oil, used paint spray cans from touch-up painting jobs, and batteries which are recycled. The building has a satellite accumulation area for these wastes.

Building IA-24 and the adjacent storage area building IA-24A house minor forklift maintenance operations and include recharge facilities for expended forklift batteries. All solid wastes generated in building IA-24 were probably disposed of in the Tidal Area Landfill until 1978. These wastes included oily wastes, oil sludge from the collection sump, battery casings, rags, old parts and tools, and cans containing small amounts of paints and solvents. In 1971, it was reported that steam cleaning wastes of grease and oil from forklifts and batteries were discharged into an improperly operating catch basin. This reportedly resulted in oil contamination of an adjacent drainage ditch.

As part of forklift maintenance, the forklifts and batteries are steam cleaned to remove oil and grease. The steam cleaner discharges through a line from the southwest side of building IA-24 and drains into Seal Creek, but the steam cleaning pad has not been used since 1988. In addition, the WPNSTA Concord personnel park 3-ton trucks on the unpaved areas between buildings IA-24 and IA-55.

A 2,000-gallon diesel UST is located along the southeast wall of building IA-24. The integrity of the UST was checked by precision testing in January 1988 and annually thereafter. The UST failed the tests twice due to piping leaks. The leaks were repaired and the the UST and piping retested. The UST again failed the test and was then taken out of service. Adjacent to the UST is a shallow vadose-zone well (installed to monitor the vapors in the vadose zone in the vicinity of the UST). During drilling of the vadose-zone well in December 1987 (ERM-West 1989), a petroleum odor was reported starting at a depth of 4 feet down to 8 feet bgs.

Building IA-24 has a sink and sanitary sewer system that drains into two septic tanks through a 6-inch VCP. The septic tanks are about 200 feet south of building IA-24 and are 20 feet from each other. Sewage from building IA-55 drains through a 6-inch cast iron (CI) sanitary sewer pipe and connects with the 6-inch VCP which connects to the two septic tanks. Railroad tracks are located 40 feet to the north of the septic tanks and parallel to Kinne Boulevard.

The septic tanks are partially covered with dirt. The outlet of each septic tank splits into two 4-inch open-joint unglazed clay pipe (UCP) which run parallel to the drain field. The two UCP drains are about 10 feet apart. Each distribution field is about 2 feet wide and 2.5 feet deep. The drain field has a slope of 0.004 along the 300-foot length.

Previous Investigations

The dumping of battery acid, reported in the IAS (E&E 1983), may have caused a low pH and possible lead contamination in the groundwater. The IAS also concluded that the acid would probably be neutralized from contact with the soil and that lead would bind to the soil, reducing its migration into groundwater. Given the absence of groundwater usage in the area, the IAS recommended no further investigation at this site (E&E 1983).

During the SI field work, performed by PRC and Montgomery Watson in 1992, soil and groundwater sampling were conducted southeast of the forklift parking lot in an attempt to verify the location of an acid disposal sump identified by IT (IT 1990). Three 4-foot-wide shallow trenches, 3 to 5 feet deep, were excavated with a backhoe in an area of stained soil identified by IT from historical aerial photographs as being the acid sump. A total of 16 soil samples were collected from 12 locations (ACS-1 through ACS-5 and ACS-7 through ACS-13) within the trenches, at 2 to 5 feet bgs. Two of these samples were collected from areas where surface soil staining was visually identified, and the remaining samples were evenly spaced throughout the trenches. The only sample that had TPHd above the detection limit was soil sample ACS-13-SB-02.0.

A 43-foot-deep soil boring (ACS-06-SB) was drilled adjacent to ACS-10, and soil samples were collected at 5-foot intervals until groundwater was encountered at 34 feet. The soil logged from the deep boring identified interbedded silt and sand from the surface to about 22 feet bgs. Sandy gravel was found from approximately 22 to 40 feet bgs, underlain by clay to a total depth of 43 feet bgs. TPHd was detected in three samples. TPHg was detected in four samples. The TPHg was detected in the samples from 0 to 20 feet, while TPHd was detected in the samples from 20 to 30 feet.

A temporary well was set within the deep soil boring (ACS-06-SB) and screened from 33 to 43 feet bgs. Groundwater was first encountered at 33.9 feet bgs, and after waiting 20 minutes, the groundwater level was measured at 34 feet bgs. Because the groundwater did not rise in the borehole, the aquifer is assumed to be at unconfined conditions. If the groundwater gradient mimics the topographic gradient, then the potentiometric surface would dip to the northwest. TPHd, methylene chloride, and trichloroethene were detected in a sample from this temporary well.

Additionally, surface soil samples were collected at the termini of two runoff locations. The first sample, ACS-01-SFC, was collected near the culvert that drains storm water from the suspected acid sump area. Storm water from this area flows into a drainage ditch that discharges into a field. TPHd and sulfate were detected in the soil sample. The second surface sample, ACS-02-SFC, was collected at the end of the steam cleaning discharge line where it discharges into Seal Creek. TPHd, TPHg, and sulfate were detected in this soil sample.

The septic tank was sampled on August 17, 1993. TRPH and total oil and grease (TOG) were detected in the sludge sample.

As part of the ongoing effort to replace or remove old USTs, an investigation was conducted by Harding Lawson Associates (HLA) on September 9, 1993. One soil boring (No. 5) was drilled adjacent to the UST to a depth of 10.5 feet bgs and sampled at 7.5 bgs feet and 10.5 feet bgs. The results indicated no petroleum hydrocarbons, specifically TPHd, were present in the soil above the detection limits.

4.2.6 SWMU 13 - Building IA-25

This section provides the site description and summary of previous investigations at SWMU 13. Figure 15 shows the locations of building IA-25 and other features. Tables 6 and 7 present the analytical results from two previous soil investigations and Table 5 presents the analytical results of the septic tank investigations at building IA-25.

Site Description

Building IA-25 is 110 feet west of the end of L Street, which intersects Kinne Boulevard approximately 2.5 miles from the main entrance and was used exclusively for pilot-scale development of munitions. During the 1940s, when the building was put into service, hexahydro-1,3,5-trinitro-s-triazine (RDX), pentaerythritol tetranitrate (PETN), lead styphnate, and lead azide were developed as military explosives. A paint booth used for repainting components was located in the southwest corner of the building. In addition to the nitrogen-based compounds, metals associated with casings, solvents, and pesticides are known to have been used in or around the facility. Pipes are wrapped in asbestos, and wall materials may also contain asbestos fibers. Building IA-25 has been renovated as a production facility for the rework of explosives. Work includes repair of (1) structural damage to walls and floor, (2) lighting systems, (3) ventilation and heating systems, and (4) removal of asbestos insulation on pipes and asbestos wallboard materials.

Building IA-25 was constructed by cutting into an existing hillside creating a berm around three sides. On the north side an engineered berm was constructed. Access is through breaks in the berm at the northeast and northwest corners. Building IA-19 (boiler house) is east of building IA-25. The topography around building IA-25 slopes gradually to the northwest.

Building IA-25 has a sink and sanitary sewer system that drains into a septic tank through a 6-inch VCP. The septic tank is about 120 feet north of building IA-25 and is partially buried. The outlet of the septic tank splits into two 4-inch open-joint tile drains which run parallel to the drain field. The tile drains are about 10 feet apart. Each distribution field is about 2 feet wide and 2 feet deep. The drain field has a slope of 0.003 to 0.004 along the 100-foot length of the drain field.

A 6-inch pit drain is also connected from building IA-25 to the north side of L Street. The end of the pit drain is filled with 0.5 cubic yard of 1.5- to 2-inch-diameter base rock, providing a minimum of 6 inches of earth cover for the pit drain.

Previous Investigations

In 1983, the IAS investigation team was told that a burn pit and solvent disposal area existed behind building IA-25 at one time. Visual examination of the area revealed no environmental damage. The IAS indicated that up to 1,000 gallons of paints and solvents may have been disposed of.

Previous investigations included sampling in the crawl space beneath the building, asbestos survey of a 50-foot-square area below the building, and an investigation of shallow soils beneath and behind the building.

A contractor was hired in 1987 to perform an asbestos survey under building IA-25 (Pacific Environmental Services, Inc. 1988). The survey reported an area of approximately 50 square feet beneath the building where pieces of pipe insulation containing asbestos fibers were found. The report stated that the general public would not be subject to any health hazards under normal conditions, but the report indicated that the asbestos area would be a hazard to maintenance workers or others who might disturb the soil beneath the building.

On November 10, 1988, Navy personnel collected eight soil samples from beneath building IA-25. Elevated levels above North Bay area background soil concentrations of nitrates, potassium, and phosphorous were detected at all locations (U.S. Geological Survey 1984). VOC were detected in samples IA25-7 and IA25-1. Semivolatile organic compounds (SVOC) were detected in samples IA25-2 and IA25-7. Pesticides were detected in sample IA25-4. Lead, zinc, and trivalent chromium were detected in sample IA25-1 at levels above the State of California total threshold limit concentrations (TTLC). Samples IA25-4 and IA25-5 had a soluble lead concentration that exceeded the soluble threshold limit concentrations (STLC).

The area beneath building IA-25 was sampled again on June 28, 1989. Soil samples were collected at depths of 0 to 6 inches, 6 to 12 inches, and 12 to 18 inches bgs from 10 locations. The upper two samples were sent to a laboratory for analyses and the third was archived. A description of the methodology and rationale are discussed in a report prepared by IT (IT 1990). Trace amounts of the pesticide 4,4'-DDT were detected in soil samples SS-01, SS-03, SS-04, SS-06, and SS-07. Herbicides were detected in soil samples from SS-04, SS-06, SS-07, and SS-08. VOCs were detected in soil samples from SS-02 and SS-07. SVOCs were detected in soil samples SS-02 and SS-07. Lead, zinc, and chromium were detected in all samples.

The septic tank was sampled on October 9, 1990, and on August 17, 1993. TRPH and TOG were detected in the liquid sample from October 9, 1990. TOG was detected in the sludge sample from August 17, 1993. VOCs and SVOCs were detected only in the October 9, 1990 liquid sample.

VOCs detected were 1,1-dichlorobenzene, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, total 1,2-dichloroethene, toluene, and trichloroethene. SVOCs detected were 4-methylphenol, di-n-octylphthalate, and 1,4-dichlorobenzene.

4.2.7 SWMU 14 - Building IA-27

This section provides the site description for SWMU 14. Figure 16 shows the locations of building IA-27 and other features.

Building IA-27, constructed in the mid 1940s, is 100 feet south of Kinne Boulevard, approximately 2.5 miles from the main entrance. It was used to house the carpenter shop, and carpentry personnel often used paints and thinners. Building IA-27 is now a storage facility for the furniture of Marines housed on base.

The building is surrounded by a 16-foot high berm on the north and south sides. A paved parking area is between building IA-27 and the south berm. Railroad tracks are adjacent to the north side of building IA-27 and run parallel to the south side of the north berm. A large parking area is between the north berm and Kinne Boulevard. West of L Street is a paved, fenced area used to store equipment and supplies.

Building IA-35 (boiler house) is about 100 feet south of building IA-27 and building IA-44 is about 120 feet to the south. A UST was removed from the south side of building IA-35 in 1992. No petroleum hydrocarbons were detected in excavated soil.

Building IA-27 has a sink and sanitary sewer system that drains into a manhole connecting to a septic tank through a 6-inch VCP. The septic tank is about 200 feet south of building IA-27, adjacent to the southwest corner of building IA-44. The reinforced concrete septic tank is about 11 feet long, 4 feet wide, and 7.5 feet deep. It is accessible through a 2-foot by 3-foot opening at the top of the tank at the ground surface. The outlet of the septic tank splits into two 4-inch open-joint tile drains which run parallel to the drain field. The two tile drains are about 10 feet apart. Each distribution field is about 2 feet wide and 2.5 feet deep. The drain field has a slope of 0.004 along the 100-foot length.

The drain field is about 40 feet from Seal Creek. During previous septic tank sampling events, the septic tank was dry and not sampled.

4.2.8 SWMU 15 - Building IA-41

This section provides the site description for SWMU 15. Figure 17 shows the locations of building IA-41 and other features.

Building IA-41, about 800 feet south of the old airport and 1,800 feet east of building IA-56, was used as a paint storage shop. According to the RFA, this building has a sink and sanitary sewer system that drains into a septic tank. However, the septic tank was not located during the septic tank sampling event performed for all septic tanks in August of 1993. Review of available engineering drawings by WPNSTA Concord did not reveal the presence of a septic tank.

The building is covered with fill material on three sides. A transmission line which belongs to the Bureau of Reclamation runs directly above building IA-41. The area around building IA-41 is flat and used for grazing. Housing is located a quarter mile south, just outside the base boundary.

4.2.9 SWMU 16 - Building IA-46

This section provides the site description for SWMU 16. Figure 18 shows the locations of building IA-46 and other features.

Building IA-46, constructed in the 1940s, is in the main industrial complex of WPNSTA Concord, approximately 1 mile east of the main entrance and north of Kinne Boulevard, off D Street. The building is fenced on all sides, with the entrance on the west side. Building IA-49 is 80 feet to the west, and building 433 is 60 feet to the east. South of building IA-46 are several buildings for storage of paint, oxygen, and acetylene. Along the south fence is a storage area for construction supplies. During the site visit, no asbestos piping or residue was noted. Suspected releases of asbestos from packing operation in drums were noted in the RFA.

A fluorescent light tube crusher, located at the east end of building IA-46, is used to reduce the bulk of used fluorescent light bulbs generated at WPNSTA Concord. Approximately 10 to 20 fluorescent light tubes are crushed bi-monthly. The crusher operates by feeding the fluorescent light tubes through a cylindrical metal tube attached to a 55-gallon drum. Any particulates from the operation are entrained by a bag attached to the tube crusher's pump. Suspected releases of mercury from fluorescent light tube crushing operations was noted in the RFA. However, no mercury residues were observed on the walls, floor, or ceiling of the room where the fluorescent light tube crusher is located. Once the drum is filled, it is transferred to building 433, which is one of the five permitted hazardous waste management units at WPNSTA Concord. It is included in the Hazardous Waste Facility Permit effective July 31, 1993.

A storage shed for accumulation of asbestos waste was located at the west end of building IA-46. Friable asbestos was stored in drums. These drums were disposed of at a permitted Class II disposal facility. Nonfriable asbestos pipe, used for minor repairs, was also stored near the shed. This shed was also used to mix pesticides. Mixing was performed according to instructions on container labels. Empty cans were triple-rinsed and the rinsed water deposited in the spray tanks. The cans were then suitable for disposal as solid waste. A sink in the shed was used to provide water for pesticide mixing. Occasional spills were reported. The IAS stated that in 1966 an agricultural lessee complained of poisonous chemicals being spilled into a drain which flowed into his cattle grazing area which is south of the intersection of Kinne Boulevard and D Street. The drain goes underneath Kinne Boulevard 200 feet east of the intersection of Kinne Boulevard and D Street. Public works personnel on the station acknowledged that chemical wastes from the pesticide storage and mixing area may have been dumped into an adjacent gutter on D Street which flowed toward the area in question. A drain was then installed from the storage shed into the sewer system.

4.2.10 SWMU 17 - Building IA-50

This section provides the site description and summary of previous investigations for SWMU 17. Figure 19 shows the locations of building IA-50 and other features. Table 5 presents the analytical results of the septic tank investigations at building IA-50.

Site Description

Building IA-50, constructed in the early 1950s, is about 100 feet south of Kinne Boulevard, 2.7 miles from the main entrance. Six years ago, building IA-50 was used as a transfer station for ordnance materials. Often, packages of ordnance materials had to be broken down and repackaged inside the building. Ordnance was labeled using stencil and paint spray cans. The used spray cans were the hazardous wastes generated at that time.

The rail/truck transfer depot at building IA-50 is similar to an end of a railway station. Both sides of the building have a platform leading to a spur railroad track. The platforms and the spur railroad tracks were used to transfer ordnance from rail to truck and vice versa.

Building IA-50 has a sink and sanitary sewer system that drains into a septic tank through a 6-inch VCP. The septic tank is about 80 feet south of building IA-50. The outlet of the septic tank splits into two 4-inch open-joint tile drains which run parallel to each other. The two tile drains are about 10 feet apart. Each distribution field is about 2 feet wide and 2 feet deep. The drain field has a slope of 0.003 to 0.004 along the 100-foot length.

Previous Investigations

The septic tank was sampled on October 9, 1990, and August 17, 1993. TRPH and TOG were detected in the October 9, 1990, liquid sample and TOG in the August 17, 1993, liquid sample. The only SVOC detected in the October 9, 1990, liquid sample was 1,4-dichlorobenzene and the VOCs detected were benzene and chlorobenzene.

4.2.11 SWMU 18 - Building IA-51

This section provides the site description. Figure 20 shows the locations of building IA-51 and other features.

Building IA-51, constructed in the 1940s, is in the main industrial complex and was used as a steam cleaning facility for locomotives, trucks, and other vehicles. The steam cleaner was deactivated in the mid 1970s when the steam cleaning unit west of building IA-12 became operational. Oily waste generated from the steam cleaning drained directly into the sump (Container No. IA-51). The oil was pumped out by a contractor's vacuum truck, and the sump was periodically cleaned by the contractor. The water was discharged to the sewer system with the approval of the CCCSD.

Until the early 1960s, a zinc chromate rust inhibitor was added to motor antifreeze. At that time, waste antifreeze was disposed of by a contractor. The change was made to an antifreeze which was believed to be free of chromates. This new antifreeze was typically discharged to the ground and into storm drains. In 1978, chromates were detected in Seal Creek. When it was discovered that the new antifreeze contained zinc chromate, the type of antifreeze was changed and biodegradable rust and scale inhibitor was added.

The area along the west side of the building is now being used to store old tires. Railroad tracks run east to west along the north and south sides of the building. A 40-foot long splash wall is 20 feet east of the building. A sump (Container No. IA-51), installed in 1945, is located 12 feet east of the center of the splash wall. The sump is made of concrete 6 inches thick and had a capacity of 40 gallons. It was filled with concrete when the steam cleaning unit was deactivated.

Aerial photographs show that a turntable for locomotives, approximately 44 feet in diameter, existed 100 feet east of building IA-51 until at least 1969. A semicircular crack in the asphalt indicates where the turntable existed. The turntable is not present in the 1976 aerial photograph which shows activity occurring at the location of the former turntable. Though the exact nature of the activity is not evident from the aerial photograph, base personnel who work at building IA-51 say that an incinerator, used to destroy classified documents, was present in the excavation for the former turntable at approximately this time. A drop pit to collect steam cleaning water was located 10 feet north of the turntable. The drop pit was destroyed when the turntable was removed.

4.2.12 SWMU 20 - Building IA-55

This section provides the site description and summary of previous investigations for SWMU 20. Figure 14 shows the locations of building IA-55 and other features. Table 4 presents the analytical results for previous soil and groundwater investigations and Table 5 presents the analytical results of the septic tank investigations at building IA-55.

Site Description

Building IA-55, constructed during the early 1950s, is located 60 feet north of Kinne Boulevard, approximately 3 miles from the main entrance. It is an office building where tools and supplies are issued and returned. New materials are locked in the nearby shed (building 422). Hazardous wastes generated include used paint spray cans and adhesives. The building serves as one of the hazardous waste satellite accumulation points for used paint spray cans.

A 500-gallon diesel UST is located near the northwest corner of building IA-55. The integrity of the UST was checked by precision testing in January 1988 and annually thereafter, and the UST has passed these tests. Adjacent to the UST, a shallow vadose-zone well was installed to monitor the vapors in the vadose zone in the vicinity of the UST. A faint diesel odor was reported from the surface down to 5 feet during drilling of the vadose-zone well in December 1987 (ERM-West 1989).

Building IA-55 has a septic tank and drain field. The sewer line connects with the building IA-24 sewer line adjacent to the southeast side of building IA-24. Refer to Section 4.2.5 for a discussion of the septic tanks and drain field which are shared by building IA-24 and building IA-55.

Previous Investigations

See Section 4.2.5 for a discussion of previous investigations.

4.2.13 SWMU 22 - Building 81

This section provides the site description and summary of previous investigations. Figure 21 shows the locations of building 81 and other features. Table 4 presents the analytical results of previous soil investigations and Table 5 presents the analytical results of the septic tank investigations at building 81.

Site Description

Building 81, constructed during the late 1950s, is located on Chosin Road approximately 1 mile east of the intersection of Kinne Boulevard and Willow Pass Road at an elevation of 320 feet msl. Fuses and hydraulic fluids are tested in this building for handling and temperature sensitivity. As part of the regular maintenance operation, labels are painted on the ordnance using stencils and paint spray cans. The hazardous waste satellite accumulation point for used paint spray cans is located in building 82.

Building 81 has cells or small rooms with reinforced walls and screened ceilings for safety. Each room has a fuse-detonating machine the size of a small oven where small quantities of ordnance fuses are detonated. Small volumes of air emissions, if any, are carried out of the building through exhaust fans. No permit from the Bay Area Air Quality Management District (BAAQMD) is needed because of the small volume of the emissions.

Three USTs are located between building 83 and building 86. The USTs, used to fuel the boilers in the boiler house and a generator, are scheduled to be removed and replaced under a separate program.

The area around the buildings is flat and covered with asphalt. A parking area parallels building 81, 60 feet to the southeast. The topography dips steeply from the parking lot to the southeast and south. To the north and northwest the topography climbs steeply. A drainage outfall at an elevation of 300 feet msl exits from underneath Chosin Drive 120 feet east of the northeast corner of building 81. The septic tank is located downslope from the outfall and 80 feet from building 81 at an elevation of 290 feet msl.

Building 81 has a sink and sanitary sewer system that drains through an 8-inch VCP to manhole No. 2, then drains through manhole No. 1 into a septic tank. The outlet of the septic tank connects to a splitter box through a 4-inch VCP. The splitter box again divides flow into two other splitter boxes. The first of these two splitter boxes divides the flow six ways through six 4-inch VCPs which drain along the 100 foot length of the drain field. The second splitter box divides the flow 12 ways through

4-inch VCPs which also drain along the full length of the drain field. The first and second splitter boxes are 200 feet from each other.

Previous Investigations

The septic tank was sampled on October 9, 1990, and August 17, 1993. TRPH was detected in the August 17, 1993, sludge sample, and TOG was detected in the August 17, 1993, liquid sample. TRPH and TOG were detected in the October 9, 1990, liquid sample. SVOCs detected in the October 9, 1990, liquid sample were di-n-octylphthalate and 4-methylphenol and in the August 17, 1993, liquid sample were 1,4-dichlorobenzene and 4-methylphenol. One VOC (total 1,2-dichloroethene) was detected in the October 9, 1990, liquid sample.

HLA conducted an investigation on September 8, 1993, of the existing UST. A soil boring (No. 1) was drilled to a depth of 21.5 feet bgs and sampled at 15.25 feet bgs and 21.0 feet bgs. The analytical results indicated TPHd was present in the 15.25-foot sample. The analysis of the 21.0-foot sample did not indicate any TPHd above the detection limits. TPHd was also detected in groundwater which was encountered at 17.0 feet bgs and sampled.

4.2.14 SWMU 23 - Building 87

This section provides the physical description and summary of previous investigations for SWMU 23. Figure 22 shows the locations of building 87 and other features. Table 5 presents the analytical results of the septic tank investigation at building 87.

Site Description

Building 87, constructed in the late 1950s, is located on Inchon Drive approximately 1 mile east of the intersection of Kinne Boulevard and Willow Pass Road at an elevation of 455 feet msl. Minor maintenance, such as labeling of ordnance using stencil and paint spray cans, was done at this building. Hazardous wastes generated included used paint spray cans, oil, and solvents. No hazardous waste is now generated at this site. WPNSTA Concord no longer does the missile work at this facility.

Building 88 and building 89 are located to the south. A 6,000-gallon steel UST for diesel fuel storage is about 25 feet west of building 87. Associated gauge, oil suction/return, and vent lines are connected to the UST. The topography slopes steeply to the south and west and terraces were constructed to stabilize the slope. The slope climbs steeply to the north and northeast.

Building 87 has a sink and sanitary sewer system that drains from a 4-inch CI pipe to a 6-inch VCP that drains into a septic tank. The septic tank is about 70 feet west of the southwest corner of building 87. The effluent from the septic tank is divided into three distribution boxes. Each distribution box again splits flow into three drain lines. Each drain line then flows along the entire length (100 feet) of the drain field. The UST discussed above is 8 feet from the edge of the drain field. A parking lot has been constructed over the drain field.

Previous Investigations

The septic tank was sampled on August 17, 1993. TOG was detected in the liquid sample. SVOCs detected in the liquid sample were diethylphthalate, butyl benzyl phthalate, bis(2-ethylhexyl)phthalate, and benzoic acid.

4.2.15 SWMU 24 - Building 93

This section provides the site description and summary of previous investigations for SWMU 24. Figure 23 shows the locations of building 93 and other features. Table 5 presents the analytical results of the septic tank investigations at building 93.

Site Description

Building 93, constructed in the early 1960s, is on the south side of Kinne Boulevard at the east end of WPNSTA Concord at an elevation of approximately 224 feet msl. Building 93 appears to be the site of one of the biggest generators of hazardous waste at WPNSTA Concord. These wastes include used paint spray cans, solvents, and adhesives. Generated wastes are stored at a satellite accumulation point provided at building 429.

The area to the west of building 93 is grass covered and slopes gradually to the edge of Seal Creek, which is approximately 400 feet west of the drain field. An elevation drop of approximately 20 feet exists between the top of the grassy field and the bottom of Seal Creek.

Sewage from building 93 is discharged through a 6-inch VCP to manhole A located 100 feet west of building 93. Manhole A connects to a 2,500-gallon prefabricated steel septic tank, located about 240 feet northwest of the manhole, through an 8-inch VCP. The outlet of the septic tank connects to a splitter box which divides the effluent into 13 4-inch open-joint VCP drains which run parallel to the distribution fields. The 13 VCP drains are each at least 7 feet apart. Each distribution field is about 2 feet wide and 2 feet deep. The drain field has a slope of 0.004 along the 100-foot length.

Previous Investigations

The septic tank was sampled on October 9, 1990, and August 17, 1993. TOG was detected in the October 9, 1990, liquid sample. TRPH and TOG were detected in the August 17, 1993, sludge sample. SVOCs detected in the October 9, 1990, liquid sample were phenol, 4-methyphenol, and benzoic acid. VOC detected in the October 9, 1990, liquid sample was toluene.

4.2.16 SWMU 25 - Building 97

This section provides the site description and summary of previous investigations for SWMU 25. Figure 24 shows the locations of building 97 and other features. Table 5 presents the analytical results of the septic tank investigations at building 97.

Site Description

Building 97, constructed in the early 1960s, is located at the east end of WPNSTA Concord at the end of R Street and was an ordnance assembly building for the Rocket Maintenance Facility of the Guided Missile Department in the Inland Area. Maintenance operations included the rebuilding of rocket motors, cleaning and painting rocket parts, and testing rocket engine components. The facility is currently unused but is being refurbished for new uses. Three USTs used to store JP-5 fuel were removed from the north side of the building in 1990 and a 4,000 gallon diesel UST was removed from the south side of building 96 during April 1994.

It was reported in the IAS that hazardous wastes generated included trichloroethane, epoxy, ethyl alcohol, contact cleaners, corrosion preventatives, oil, JP-5 rocket fuel, and solvent wastes. The hazardous wastes are collected per the WPNSTA Concord RCRA permit and disposed of off base. Paint sludge was bagged and similarly handled. Until about 1978, the Tidal Area Landfill probably received all wastes generated from the building.

Building 97 has a sink and sanitary sewer system that drains to a septic tank through a 6-inch VCP. The 2,500-gallon prefabricated steel septic tank is about 200 feet southwest of building 97. The outlet of the septic tank connects to a splitter box which divides the effluent into nine 4-inch open-joint VCP drains which run parallel to the drain field. The nine VCP drains are at least 7 feet apart. Each distribution field is about 2 feet wide and 2 feet deep. The drain field has a slope of 0.005 along the 100-foot length of the drain field.

Previous Investigations

The septic tank was sampled on October 9, 1990, and August 17, 1993. TOG was detected in the October 9, 1990, and August 17, 1993, liquid samples. SVOCs detected in the October 9, 1990, liquid sample were phenol, benzo(a)anthracene, 1,4-dichlorobenzene, 4-methylphenol, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, and dibenz(a,h)anthracene. SVOCs detected in the August 17, 1993, liquid sample were 1,4-dichlorobenzene, phenol, and 4-methylphenol.

On December 9, 1990, the three USTs north of building 97 were removed. Results of analysis of the soil samples from the UST excavation were below the method detection limit (Minter & Fahy 1991). The excavation was overseen by the CCCEHD. No analytical results were available for the removal of the 4,000 gallon UST at the time this plan was prepared.

4.2.17 SWMU 37 - Building A-29

This section provides the site description and summary of previous investigations for SWMU 37. Figure 25 shows the locations of building A-29 and other features.

Site Description

Building A-29 is at the end of Davidson Road, adjacent to the Wood Hogger site (IR Site 11) which is being investigated under the IRP. The SWMU includes areas that have not been investigated under the IRP. The boundaries include Davidson Road to the south and east, building A-29 to the west, and the open field to the north. The Wood Hogger site is located to the south and west. The wood hogger machinery is still in place.

Approximately 600 cubic yards of treated wood debris was removed from the dunnage area in 1992. Most of this wood waste was chemically treated. Dark brown wood was treated with creosote, light brown wood with pentachlorophenol, and the greenish wood with copper arsenate. Most treated wood waste items, such as used railroad ties or wharf timbers, are recycled on base or off base through other federal or state agencies for projects such as landscaping and retaining walls or are sold to contractors who reuse the timbers for applications requiring use of treated wood. Some scrap treated wood was stockpiled near building A-29.

The storage yard is currently paved with asphalt, and aerial photographs from as far back as 1952 show this storage yard in use, with railroad tracks providing access to the storage yard from the northeast corner of the site. The storage yard now contains scrap metal and wood, other surplus materials, and is generally covered with weathered wood chips. The current storage practices in the storage area and historical photographs indicate that a variety of wood and metal materials have been stored in sections of the yard at various times. Because of the dispersed and different materials disposed of in sections over a long period of time, it may be difficult to assign specific sources of chemicals as being associated with currently stored materials.

The open areas to the north are currently bare soil covered by intermittently sparse and dense vegetation. The bare soil areas just off the asphalt pavement show some debris resulting from stored materials being windblown or deposited into these areas.

Previous Investigations

The Wood Hogger site which surrounds SWMU 37 is being investigated under the IRP. IT conducted an SI at the Wood Hogger site during 1989 through 1991. The SI included installing four shallow monitoring wells located around and north of the wood hogger equipment, collecting 12 surface water samples, and drilling and sampling 15 soil borings. Groundwater, surface water, soil, and sediment samples were collected. Based on the site history, contaminants of concern were determined to be VOCs, SVOCs, pesticide/PCBs, metals, explosives, and total organic carbon (TOC). Analytical results are not presented here because the Wood Hogger site is outside the investigation area. A summary of the investigation is presented since SWMU 37 will likely be incorporated into the IRP and it is necessary to know what the chemicals of potential concern (COPC) are since the results of the SI will be incorporated into the IRP. Refer to the RI/FS work plan (PRC/Montgomery Watson 1992) for a more detailed summary of the investigation results. The following paragraphs summarize the investigation.

Groundwater samples were collected for four quarters. The only VOC detected was acetone. Five SVOCs were detected in the groundwater. Five of the six metals with background values were detected at concentrations above the background range determined by IT (IT 1992).

The surface water samples were collected from four surface locations. The two VOCs detected were methylene chloride and acetone. No metals were detected above the IT-defined background levels for the site (IT 1992).

Forty soil samples were collected from the soil borings. A total of 31 organic compounds were detected in the soil. VOCs detected were acetone, 2-butanone, carbon disulfide, methylene chloride, and tetrachloroethene. SVOCs detected included 2-methylnaphthalene, 3,3'-dichlorobenzidine, benzoic acid, PAHs, and phthalates. The chlorinated pesticides 4,4'-DDT and chlordane were detected five times. Three explosive compounds were detected in two soil borings. Four of the six metals with background values were detected at concentrations above the background range determined by IT (IT 1992).

Eight sediment samples were collected from throughout the site. Four VOCs were detected in the samples, but all of the chemicals detected were common laboratory contaminants or a naturally occurring compound in the bay environment. Two phthalates were detected at all of the sample locations. Copper and zinc were detected along the southern portion of the site at concentrations above IT defined background range (IT 1992).

4.2.18 SWMU 40 - Building 174

This section provides the site description for SWMU 40. Figure 26 shows the locations of building 174 and other features.

Building 174 is at the southeast corner of the intersection of White Road and Anderson Road, and serves as an electric substation which houses the electrical transformer that steps power down to distribution voltage levels. The transformer does not contain PCBs. In the past, this site housed a PCB transformer and may have been used to temporarily store PCB transformers that were not in use. The "not in use" transformers were reported to have leaked. Drip pans were used to contain the leaks.

4.2.19 SWMU 44 - Building 350

This section provides the site description and summary of previous investigations for SWMU 44. Figure 27 shows the locations of building 350 and other features. Table 5 presents the analytical results of the septic tank investigation at building 350.

Site Description

Building 350 is located at the east end of the Tidal Area, 200 feet south of Port Chicago Highway and is within a double fenced area. It is known as the "Q" Area. It was formerly guarded by U.S.

Marine Corps personnel. During the course of this operation, used paint spray cans, rags, and solvents are generated. This building is one of the satellite accumulation points for hazardous waste.

Building 350 has two USTs, UST 350A and UST 350B, for diesel fuel oil storage. UST 350A is used to fuel the steam boiler that provides heating to this building, and UST 350B provides fuel to an emergency electrical generator for the building. Both USTs were installed in 1981 and have a capacity of 2,000 gallons. A yearly leak test is done on these USTs, and the results are submitted to the CCCEHD. In June 1991, a pressure gage leaked about 20 gallons of diesel fuel oil onto the floor in building 350. Navy personnel contained and cleaned up the spill using absorbent materials.

According to records, building 350 and building 351 (a former Marine guard post) have sinks and sanitary sewer systems that drain into a common septic tank. The septic tank is located 55 feet from the southeast corner of Building 350. Sanitary sewer lines from building 350 and building 351 hook into a common manhole (manhole 1) 12 feet southwest of the septic tank. The drain field extends north of the septic tank and parallels building 350.

Previous Investigations

The septic tank was sampled on August 17, 1993. TOG was detected in the liquid sample. The only SVOC detected in the liquid sample was 4-methylphenol. VOCs detected in the liquid sample were 1,4-dichlorobenzene and toluene.

4.2.20 SWMU 50 - Building E-108

This section provides the site description and summary of previous investigation for SWMU 50. Figure 28 shows the locations of building E-108 and other features. Table 4 presents the analytical results of the previous soil and groundwater investigations at building E-108.

Site Description

The site of former building E-108 is located in a paved parking area south of the intersection of Christenbury Road and Born Road. Building E-108 was the boiler house that supplied heat to barracks located in this area. A 500-gallon fuel oil UST was used to fire the boilers. The building was declared surplus in March 1965 and was removed from the site. It is not known whether the UST designated E-108 was removed or abandoned in place.

The gate into the Tidal Area is approximately 300 feet to the south. Building E-85 also lies to the south. A 1,500-gallon fuel oil UST is located at the northeast corner of building E-85. Building E-109 is to the northeast and building E-106 to the west.

Previous Investigations

During 1994, construction began to repair the parking lot north of building E-85. During leveling of the parking lot, the foundation for the old boiler house was encountered. To test the depth of the foundation, a test hole was made adjacent to the southwest corner of the foundation using a backhoe. Discoloration of the soil from 4 to 6 feet bgs and a small amount of organic matter at 6 feet bgs were observed. Samples of the soil and groundwater were collected on December 30, 1993, and analyzed for TPHd. The analysis showed the presence of TPHd in water and in soil at 2 feet and 4 feet. TOG was also detected in water. Additional holes were excavated 20 feet to the north, south, west, and east on January 20, 1994. The results showed that the TPHd was not present in soil samples from the north and east holes, but was present in the west hole (E-85 West). No TPHd was detected in the south hole, but the soil was discolored. A groundwater sample was also collected from the monitoring well adjacent to UST E-85. The results showed the presence of nondiesel petroleum hydrocarbons.

HLA conducted an investigation of UST E-85 on September 10, 1993. A soil boring (No. 7) was drilled adjacent to the building E-85 UST to a depth of 10 feet bgs and sampled at 4.25 and 7.5 feet bgs. The results indicated TPHd was present in the soil samples. TPHd was also detected in groundwater which was encountered at 10.0 feet bgs and sampled.

4.2.21 SWMU 51 - Building IA-56

This section provides the site description and summary of previous investigations for SWMU 51. Figure 29 shows the locations of building IA-56 and other features. Table 5 presents the analytical results of the previous septic tank investigation at building IA-56.

Site Description

Building IA-56 is at the old airport at the end of Beckman Road. The past operations of building IA-56 are not documented. It is believed that it was an administration building for the runway located at the site. The building is now being used as a forklift training school.

Building IA-56 has a sink and sanitary sewer system that drains through a 6-inch CI pipe into a septic tank about 50 feet away. In 1991 the drain field was replaced, but the septic tank was not. The old drain field is located east of the new drain field, which partially overlaps the old drain field. The outlet of the septic tank connects to a splitter box, about 25 feet away, through a 6-inch CI pipe. The splitter box divides effluent from the septic tank six ways through 4-inch-diameter PVC perforated pipes. The distribution box and drain field were installed in 1992 adjacent to the old drain field. Each distribution field is about 2 feet wide and 3.5 feet deep. The drain field has a slope of 0.004 along the 50-foot length.

Previous Investigations

The septic tank was sampled on August 17, 1993. SVOCs detected in the liquid sample were benzoic acid, 4-methylphenol, and phenol.

4.2.22 SWMU 52 - Building 7SH5

This section provides the site description and summary of previous investigations for SWMU 52. Figure 30 shows the locations of building 7SH5 and other features. Table 4 presents the analytical results from previous soil investigations and table 5 presents the analytical results of the septic tank investigations at building 7SH5.

Site Description

Building 7SH5 is located between Sixteenth Street and Seventeenth Street and was formerly a missile wing and fin repair facility. The building is currently used to manufacture mobile laboratories to be used during explosive inspection and test activities at remote sites. According to the IAS (E&E 1983), the building was an ammunition storage magazine before 1970. Activities at the building since 1970 included paint stripping, cleaning, and repainting missile wings and fins. Acetone, trichloroethane, methyl ethyl ketone, chloroethane, and several types of paint thinners were used. The quantity of wastes generated from activities in the building were probably less than 100 gallons per year. From 1970 to 1978, the Tidal Area Landfill reportedly received all wastes from building 7SH5. After 1978, generated wastes have been disposed of off base. However, during the IAS there was an allegation that paints, oil, and solvents were disposed of in a 24-inch-deep earthen pit or into a nearby drainage ditch (E&E 1983). IT (1989) determined the pit to have been in the parking lot near the southwest corner of building 7SH5, where a section of the pavement is missing. This disposal practice has ceased and subsequently the pit was backfilled (IT 1989). The procedure used to abandon the pit was not reported.

On the west side of building 7SH5, a 12-foot-wide, 7-foot-deep ditch drains portions of the parking lot to the south of building 7SH5. A 1,000 gallon steel UST for storing diesel is along the center of the south wall.

Building 7SH5 has a sink and sanitary sewer system that drains into a 500-gallon septic tank through a 4-inch VCP. The septic tank is about 40 feet northwest of building 7SH5. The septic tank is completely covered with dirt material. The distribution box splits the effluent into four 4-inch open-joint UCP which run parallel to the drain field and are about 8 feet apart. Each distribution field is about 2 feet wide and 3.5 feet deep. The drain field has a slope of 0.004 along the 60-foot length.

Previous Investigations

The IAS eliminated this site from consideration because of the small quantity of wastes that might be present. However, due to changes in regulations since the IAS and the absence of records on the disposal activities and pit abandonment, this site was included in the WPNSTA Concord Inland Sites SI to determine if it poses an environmental or health hazard under current regulations.

The investigation at SWMU 52 included the collection and analysis of soil samples from three soil borings within the backfilled pit and the collection and analysis of one composite surface soil sample from the bottom of the drainage ditch. The three soil borings within the backfilled pit were drilled to a depth of 4 feet. Three surface soil samples were also collected from the ditch parallel and adjacent to Seventeenth Street. The three soil samples from the ditch were composited in the laboratory into one sample for chemical analysis. The soil samples were analyzed for VOCs, SVOCs, metals, tributyltin (TBT), and TPH.

Two soil samples were collected from each of the three soil borings at depths of approximately 2 and 4 feet. The soil sample at the 3.5-foot depth from SB-1 contained TPHd. The sample at the 2-foot depth in the same soil boring did not contain any TPHd. The majority of the metals from soil samples in the pit were not above the reference level of the arithmetic mean plus three standard deviations. The only metals above the 95 percent/95 percent tolerance interval reference level were arsenic, calcium, copper, lead, and mercury. The 95 percent/95 percent tolerance interval is presented because it was considered as being the most statistically meaningful value for evaluating the distribution of background data presented in the SI report (PRC/Montgomery Watson 1993)

The composite soil sample from the ditch detected TPHd, bis(2-ethylhexyl)phthalate, and toluene. No other VOCs and SVOCs were detected. Arsenic, for which the data was qualified, was the only analyzed metal from the composite ditch sample that exceeded the reference level for metals.

The septic tank was sampled on October 9, 1990, and August 17, 1993. TOG was detected in the liquid sample both times. SVOCs detected in the October 9, 1990, liquid sample were 4-methylphenol, naphthalene, phenol, benzoic acid, and 1,4-dichlorobenzene and in the August 17, 1993, liquid sample were 1,4-dichlorobenzene, 4-methylphenol, and naphthalene. VOCs detected in the October 9, 1990, liquid sample were 1,4-dichlorobenzene, toluene, and total 1,2-dichloroethene.

An investigation of the UST located south of building 7SH5 was conducted by HLA on September 27, 1993. A soil boring (No. 2) was drilled to a depth of 16.5 bgs and sampled at 4.5, 8, and 16 feet bgs. The soil sample results indicted that TPHd was present in the 4.5- and 8-foot samples. The 16-foot sample did not indicate any TPHd in the soil above the detection limits. SVOCs detected in the 4.5-foot soil sample were acenaphthene, fluorene, 2-methyl-naphthalene, and naphthalene. The SVOC detected in the 8-foot soil sample was naphthalene. No SVOCs was detected in the 16-foot sample.

4.2.23 SWMU 53 - Building 7SH14

This section provides the site description and summary of previous investigations for SWMU 53. Figure 31 shows the locations of building 7SH14 and other features. Table 5 presents the analytical results of the septic tank investigations at building 7SH14.

Site Description

Building 7SH14, constructed during the 1940s, is located on Seventeenth Street approximately 3/4 mile south of the intersection of Kinne Boulevard and Wilden Road. The building was used to store munitions in the past. The building is now used for inert storage, environmental testing, and training.

A 5,000-gallon UST is located at the northeast corner of building 7SH14 near the railway spur. It contained diesel fuel to serve oil-fired heaters inside the building. The UST is scheduled to be removed and replaced under a separate program.

Building 7SH14 has a sink and sanitary sewer system that drains through a 4-inch pipe to the inlet manhole of a septic tank. The septic tank has a capacity of 1,500 gallons. The outlet manhole of the septic tank connects to a splitter box through a 4-inch pipe. The splitter box divides effluent from the septic tank flow into nine 4-inch pipes which run parallel to the drain field and are about 7 feet apart. The drain pipes run along the entire 50-foot length of the drain field which has a slope of 0.02.

Previous Investigations

The old septic tank was sampled on October 9, 1990, and August 17, 1993. TOG was detected in the liquid samples.

4.2.24 SWMU 54 - Building 79

This section provides the site description and summary of previous investigations for SWMU 54. Figure 32 shows the locations of building 79 and other features. Table 5 presents the analytical results of the septic tank investigation at building 79.

Site Description

Building 79, constructed during the 1950s, is at the intersection of Kula Gulf Street and Coral Sea Road approximately a quarter mile north of Kinne Boulevard. Building 79 housed the Reaction Fast Force consisting of 20 to 30 Marines who patrolled the Alpha high-security area. The Marines would remain in the building for shifts of up to 12 to 24 hours before being relieved. The facility maintained a kitchen and restrooms for the Marines. After being abandoned in the mid 1980s, plans were drawn up to convert the building into an x-ray facility. Construction began but was never completed. The building is no longer being used.

Building 79 has an old septic tank and drain field system that was abandoned in 1978. The old septic tank was about 60 feet east of the building. The drain field, which is about 60 feet by 120 feet, is just north of the Alpha area and about 80 feet east of building 79. The 6-inch VCP connected to the old septic tank was plugged with concrete.

The new sink and sanitary sewer system drains into a 2,175-gallon septic tank through a 4-inch VCP. The septic tank is about 80 feet west of building 79. The septic tank is completely covered with dirt. The outlet of the septic tank sends the effluent into a distribution box through a 4-inch VCP. The distribution box splits the effluent into 10 4-inch open-joint UCPs which run parallel to the drain field. Each UCP drain is about 10 feet apart. Each distribution field is about 2 feet wide and 2.5 feet deep. The drain field has a slope of 0.003 along the 100-foot length.

Previous Investigations

The septic tank was sampled on August 17, 1993. TOG was detected in the liquid sample. SVOCs detected in the liquid sample were 1,3-dichlorobenzene and 2,4-dichlorophenol.

5.0 PROPOSED INVESTIGATIONS AND SAMPLING RATIONALE

The objective of the SI is to identify potential on-site sources of COPCs. The results of the SI will be used to determine if COPCs are present at levels which warrant further investigations to characterize the extent of these COPCs in soil, sediment, or groundwater; identify the migration pathways; or evaluate potential human and environmental receptors. Specific objectives of the SI include the following:

- Characterize the geology and hydrogeology underlying the SWMUs;
- Identify potential chemical sources;
- Determine the nature of chemicals present in groundwater, soil, surface water, and sediment;
- Determine which SWMUs will require further investigation.

To meet these objectives, surface and subsurface samples will be collected at each of the 24 SWMUs to be investigated. The sampling activities will include collecting groundwater, soil, and sediment samples; trench samples; and liquid and sludge samples from the septic tanks. Sampling locations have been selected based on site observations, interpretation of aerial photographs, review of technical drawings and site reports, and information from the RFA and the IAS.

Table 8 presents the summary of wastes generated and COPCs for each SWMU. These COPCs are used to define the analyses to be performed on environmental samples collected during the SI. Table 9 summarizes the sampling program for each SWMU. The analyses to be performed on soil, liquid, and sludge samples collected at each SWMU are summarized in Tables 10 and 11. The specific test methods and other analytical considerations are further discussed in the QAPjP. An overview of the field investigation strategies is presented in Section 5.1. The specific activities and rationale for each SWMU are presented in Sections 5.2 through 5.25.

5.1 OVERVIEW OF FIELD INVESTIGATION STRATEGIES

This section provides an overview of the field investigation strategies and approaches to be used for the SI at each SWMU. They are summarized here to minimize repetition in explaining these during each specific SWMU subsection.

Soil Investigations

Shallow soil borings (hand-augered to 5 feet bgs) will be advanced in areas where the source for COPCs is suspected of being at the surface or at shallow depth, such as septic system drain fields, burn pit areas, or surface spill areas. Analytical results from soil samples collected from the shallow soil borings will assist in determining areas that have been impacted by COPCs and the nature of the COPCs.

Investigations will use deep soil borings (advanced with a truck-mounted rig or Geoprobe) to determine if COPCs have migrated vertically; in addition, groundwater samples will be collected from deep soil borings using HydroPunch or Geoprobe and from previously installed and newly installed monitoring wells. Generally, deep soil borings will be located in areas where the source of the COPCs may have the highest concentration (for example, next to septic tanks, at the center of drain fields, or adjacent to sumps or USTs). The deep soil borings will be advanced to varying depths specified later in each SWMU subsection. Analytical results from the soil samples will be used to determine whether COPCs have migrated vertically in areas being investigated.

Subsurface soil samples will also be collected from trenches excavated in selected areas. Trenches are proposed at SWMU 2.

Groundwater Investigations

Groundwater investigations will be conducted at SWMUs 37, 44, and 50 in the tidal area. Groundwater is anticipated to be at 5 to 10 feet bgs.

Groundwater samples at SWMU 37 and 44 will be collected using either HydroPunch or Geoprobe sampling methods. If PRCs field geologist determines that aquifer materials are sandy indicating possible channel sands, monitoring wells may be installed. No groundwater samples will be collected from existing wells in the wood hogger area.

Monitoring wells will be installed at SWMU 50. Groundwater contamination was detected in groundwater samples collected during construction activities for the parking lot. The extent of this contamination has not been determined.

Groundwater investigations will be conducted at SWMUs 5, 7, and 18 in the inland area using either HydroPunch or Geoprobe sampling methods. These SWMUs are in the industrial complex area and historically have generated large amounts of hazardous waste. It is possible that the source of VOCs detected in groundwater at SWMU 1 may have originated from the industrial area. COPCs present may have migrated to groundwater, at a depth of approximately 20 feet bgs. Existing monitoring wells will also be sampled at SWMU 1, 37, and 50. No groundwater investigations are proposed at SWMUs where septic tanks are located. SWMUs with septic tanks are located in areas where groundwater is generally greater than 35 feet bgs. Since it is unknown whether these SWMUs have been impacted by COPCs, no groundwater samples will be collected during the investigation. If field observations indicate COPCs have impacted a drain field to a depth of 15 feet bgs, a modification to the investigation activities will be made to include groundwater sampling. All groundwater samples will be submitted to a Contract Laboratory Program (CLP) laboratory for analysis.

Septic Tank Investigations

Liquid and sludge from septic tanks located at 14 SWMUs (12, 13, 14, 17, 20, 22, 23, 24, 25, 44, 51, 52, 53, and 54) will be sampled. This will confirm the results of previous sampling during 1990 and 1993. In addition, one deep soil boring will be advanced to 15 feet bgs within 5 feet of the edge of each septic tank. Because of their ages, it is possible that some septic tanks may have developed leaks. The soil borings will be used to determine whether any COPCs leaked into the underlying soil from these septic tanks. The bottoms of the septic tanks are approximately 5 feet below the ground surface. This will allow for three samples collected at 5 foot intervals to be collected from each soil boring. The soil borings will be located in a downslope direction or between the septic tank and the nearby drainage route. All liquid and sludge samples will be submitted to a CLP laboratory for analysis.

The drain fields for six SWMUs (12, 13, 14, 17, 20, and 44) are similar in that they consist of two 100-foot-long distribution lines paralleling each other with a separation of approximately 10 feet. Because the distribution lines were constructed with a slope, it is possible that the majority of effluent from the septic tank migrated into the subsurface from the ends of the drain fields. It is also possible that distribution lines became plugged or collapsed. Therefore, one shallow soil boring will be advanced approximately 20 feet from the end of each drain field and adjacent to one of the distribution lines. One deep soil boring (advanced to 15 feet bgs) will be drilled in the approximate center of each drain field. Any COPCs migrating into the subsurface would likely migrate laterally as well as vertically. A deep soil boring at the center of the drain field should encounter COPCs, if present, from both distribution lines. These soil borings will assist in determining whether COPCs are present in soils underlying the drain field.

The drain fields for eight SWMUs (22, 23, 24, 25, 51, 52, 53, and 54) were constructed with more than two distribution lines (6, 9, 13, 9, 7, 4, 9, and 6 leach lines, respectively) and, therefore, cover larger areas. Four shallow and one deep soil borings will be advanced within each drain field. Because the distribution lines were constructed with a slope, it is probable that the majority of effluent from the septic tanks migrated into the subsurface from the ends of the drain fields. It is also possible that some of the distribution lines became plugged or collapsed. The distribution of the shallow soil borings will be determined based on the configuration of each drain field, but will be located adjacent to distribution lines. One deep soil boring (advanced to 15 feet bgs) will be drilled in the approximate center of the drain field. Any COPCs migrating into the subsurface would likely migrate laterally as well as vertically. A deep soil boring at the center of the drain field should encounter COPCs from several distribution lines. These soil borings will assist in determining whether COPCs are present in soils underlying the drain field.

Soil Sampling

Soil samples will be collected from soil borings at varied intervals depending on the type of boring and location being investigated. Because the distribution fields are 1 to 2 feet below the ground surface, soil samples from shallow soil borings within the drain fields will be collected at 2 feet and 5 feet bgs. Soil samples from other shallow soil borings where surface spills may have occurred or along drainage channels, will be collected from 0 to 0.5 feet bgs and 4.5 to 5 feet bgs. Soil samples from deep soil borings will be collected at 5-foot intervals. Soil samples from deep soil borings where surface spills may have occurred, will also be collected from 0 to 0.5 feet bgs. These soil samples will be specified in the sections to follow. Soil samples will also be collected at changes in lithology, immediately above the water table, and at locations that exhibit sensory cues such as staining or odor. All soil samples will be submitted to a CLP laboratory for analysis.

Surface Water Sampling

Surface water will be sampled at SWMUs 13, 18, 22, and 52, if surface water is present. The purpose is to investigate the possibility that COPCs have migrated into nearby drainage channels from possible source areas. Surface water will not be sampled at sites where the source of possible COPCs is below the ground surface or sites with limited use. Surface water at these sites would not be representative of the COPCs used previously at the SWMU.

Preliminary Field Activities

Reconnaissance activities will be conducted prior to any field sampling activities. A utility clearance will be conducted at each site prior to initiation of field activities. The field team leader will visit each SWMU with the WPNSTA Concord public works coordinator to ensure that soil boring locations do not threaten any government utility lines and that all the proper drilling permits are obtained. Public utility lines crossing the investigation areas will be identified through a commercial utility locating service. Geophysical surveys will also be conducted at each soil boring, monitoring well, and trench location as part of the utility clearance effort.

5.2 SWMU 1 - BUILDING IA-6

The area around building IA-6 has undergone previous investigations. An UST was removed and soil and groundwater contamination detected. The mound of dirt noted in the RFA has been removed, and additional monitoring wells have been installed. During the investigations, no soil borings were drilled adjacent to the grease and sand trap. This is a potential source for the petroleum hydrocarbons and VOCs detected in soil and groundwater.

Three deep (advanced to groundwater, approximately 20 feet bgs) soil borings are proposed. Figure 10 shows the approximate locations of the soil borings. Groundwater will be sampled from 6 existing monitoring wells (MW-1, MW-2, MW-3, MW-4, MW-5, and MW-6). The soil and groundwater sampling activities and analysis rationale are described below.

5.2.1 Soil Sampling

One soil boring will be advanced within 5 feet of the north (01-SB02) and south (01-SB03) ends of the grease and sand trap. These locations were selected because the presence of overhead powerlines prohibit drilling along the west edge, and building IA-6 and a tree are along the east edge. Analytical data for soil samples from these soil borings will be used to determine whether COPCs have leaked into the subsurface from the grease and sand trap.

One soil boring (01-SB01) will be advanced approximately 25 feet to the west, where ponded water from the hole in the ground was noted (refer to Section 4.2.1). Analytical data for soil samples from this soil boring will assist in determining whether any COPCs are present in subsurface soils due to water being purged from either the boiler house or grease and sand trap. One soil sample will also be collected from 0 to 0.5 feet bgs from soil boring 01-SB01 to determine the nature of the COPC that is causing the distressed vegetation.

5.2.2 Groundwater Sampling

Groundwater samples will be collected from monitoring wells MW-1, MW-2, MW-3, MW-4, MW-5, and MW-6. The results will be used to confirm previous results and to determine whether COPCs have migrated farther downgradient. Monitoring well MW-1 was selected because it is located near the source of the fuel spill and floating product was detected; monitoring well MW-2 was selected because it is located upgradient of the fuel spill and will indicate whether any off-site COPCs are migrating onto the SWMU; and monitoring wells MW-4 and MW-5 were selected because they are downgradient and will indicate whether COPCs have migrated off site.

5.2.3 Analytical Parameters

Building IA-6 is a boiler house. The boilers were sometimes fueled from a 10,000 gallon diesel UST which has been removed. Before the UST was removed, a fuel spill occurred during which 1,900 gallons of diesel leaked into the environment. During subsequent investigations, petroleum hydrocarbons were detected in soil and groundwater adjacent to the UST. In addition, VOCs (tetrachloroethene, trichloroethene, 1,1-dichloroethene, and chloroform) were detected in a groundwater sample from monitoring well MW-5, and tetrachloroethene was detected in all monitoring wells. Based on this past analytical data, COPCs include petroleum hydrocarbons and VOCs. Therefore, all soil and groundwater samples will be analyzed for TOG, TPHd, and VOCs. In addition, because boiler purge water generally has a high pH due to anti-corrosion and other chemicals for treatment being added, soil samples will also be analyzed for pH.

5.3 SWMU 2 - BUILDING IA-7

Investigations at SWMU 2 will include the former burn pit area, drainage extending toward Seal Creek, and the satellite hazardous waste accumulation area. These are areas referred to in the RFA as potentially having COPCs in soil.

A total of eight shallow and one deep (advanced to 15 feet bgs) soil borings are proposed. Figure 11 shows the approximate locations of the soil borings. Three trenches will also be excavated, and three soil samples will be collected from the bottom of each trench. The soil sampling activities and analysis rationale are described below.

5.3.1 Soil Sampling

Two shallow (02-HA05 and 02-HA06) and one deep (02-SB01) soil borings will be advanced in the area of the former burn pit. The shallow soil borings will be located at the edges and the deep soil boring will be located in the center of the area where the distressed vegetation was noted. A soil sample will also be collected from the deep soil boring from 0 to 0.5 foot bgs.

Interpretation of aerial photographs and discussions with personnel at building IA-7 indicate that the parking lot has been expanded. The area underlying the southwest portion of the parking lot (an area approximately 30 by 60 feet) may have been part of the burn pit and is suspected of being used to dispose of used fire extinguishers. To ensure that sufficient area is investigated, three trenches (02-TR01, 02-TR02, and 02-TR03) will be excavated to investigate this area. The soil samples will be collected from the ends of each trench and in the center of the trench. Each trench will be approximately 10 feet long, 3 feet wide, and 4 feet deep. Soil samples will be collected from native soil. The field geologist will make the determination as to when native soil is encountered.

The RFA stated that burn residues were scraped off the soil and deposited in the drainage to Seal Creek. Because the exact location of the residues is unknown, four shallow soil borings (02-HA01, 02-HA02, 02-HA03, and 02-HA04) spaced at approximately 50-foot intervals will be advanced along the drainage leading to Seal Creek. Since this is a drainage channel, it is likely that COPCs would have been distributed along the length of the drainage channel. The exact locations for the shallow soil borings will be determined during preliminary field activities, but preference will be given to areas along the ditch where water accumulates. Samples will be collected at depths of 0 to 0.5 feet and 5 to 5.5 feet bgs.

Two shallow soil borings (02-HA07 and 02-HA08) will be advanced adjacent to the building located at the hazardous waste accumulation area. The soil borings will be located in areas of visible staining within 5 feet of the building. If no staining is evident, the soil borings will be located in front of the door to the building.

5.3.2 Analytical Parameters

Building IA-7 is the fire station. Based on historic data, napalm and petroleum products may have been burned at the site. COPCs include TPHd, TPHg, and BTEX. All soil samples will be analyzed for these COPCs. If napalm or associated products are encountered, the sample will be analyzed by the Toxic Characteristic Leaching Procedure (TCLP) method for VOCs in the context of evaluating waste disposal options.

Chemicals used for fire fighting include potassium chloride, sodium chloride, ammonium phosphate, and potassium carbonate. Therefore, soil samples will also be analyzed for metals, anions, and carbonates.

5.4 SWMU 5 - BUILDING IA-12

Investigations at SWMU 5 will include the grease and sand trap in building IA-12, the northwest corner of building IA-12 where a fuel dispenser is located, the battery storage area along the north side of building IA-12, the southeast corner of building IA-12, and the oil/water separator adjacent to the steam cleaning area. The former UST location along the center of the south wall will not be investigated since it is undergoing RCRA closure and is being investigated separately.

A total of four shallow and four deep (advanced to groundwater, approximately 20 feet bgs) soil borings are proposed. Figure 12 shows the approximate locations of all the soil borings. Groundwater samples will be collected from the four deep soil borings using HydroPunch or Geoprobe sampling methods. The soil and groundwater sampling activities and analysis rationale are described below.

5.4.1 Soil Sampling

One deep soil boring (05-SB03) will be advanced adjacent to the grease and sand trap and one deep soil boring (05-SB02) will be advanced within 5 feet of the edge of the fuel dispenser. These areas were not mentioned in the RFA but are potential sources for leaking COPCs into the subsurface. The soil boring adjacent to the grease and sand trap will be located as close to the building wall as possible and directly opposite the grease and sand trap. The soil boring adjacent to the fuel dispenser will assist in determining whether any fuel releases have occurred from its associated piping.

Two shallow (05-HA03 and 05-HA04) and one deep (05-SB01) soil borings will be advanced in the paved area along the north wall of building IA-12 in areas where staining or cracks are evident. This area is described in the RFA as being a satellite accumulation point for batteries. Analytical data for soil samples from the deep soil boring will provide information to determine whether COPCs have migrated vertically and to determine whether a fuel release has occurred from the three USTs located 50 feet north of building IA-12. Refer to Figure 13 for the locations of the three USTs.

Two shallow soil borings (05-HA01 and 05-HA02) will be advanced along the southeast wall. This is a satellite accumulation area for drums of motor oil and waste oil. Petroleum hydrocarbon staining was evident during the site inspection in a 10-foot by 40-foot paved area. The soil borings will be located in the areas where the highest degree of staining is visually apparent. Because the area is paved, it is likely that any spills would be contained at the surface. Migration through cracks in the asphalt may occur, though no significant cracks were noted. Because this area may have been repaved, thus masking any cracked asphalt or staining, soil samples will be collected.

One deep soil boring (05-SB04) will be advanced within 5 feet of the edge of the oil/water separator. This soil boring will be located in an area where staining is evident. The final location will be determined during preliminary field activities.

5.4.2 Groundwater Sampling

Groundwater grab samples will be collected from the four deep soil borings using either HydroPunch or Geoprobe sampling methods. These samples will be used to evaluate whether groundwater has been impacted by COPCs. The rationale for the sampling locations is discussed in Section 5.4.1.

5.4.3 Analytical Parameters

Based on past operations at building IA-12, COPCs are expected to consist of petroleum hydrocarbons, VOCs, SVOCs, metals, and battery acid. These are COPCs that may or may not have been used at each area to be investigated.

Soil samples from soil boring 05-SB03 will be analyzed for TPHd, metals, VOCs, SVOCs, TOG, and pH. These COPCs may have been washed or spilled into the grease and sand trap, and possibly migrated into underlying soils through cracks in the floor or walls. Soil samples from soil boring 05-SB02 will be analyzed for TPHd, TPHg, and BTEX. Soil samples from soil borings 05-HA3, 05-HA04, and 05-SB01 along the north wall will be analyzed for pH and metals. VOCs, TPHd, and

BTEX are not COPCs in soil for this area since only batteries were stored there. Soil samples from soil boring 05-SB04 in the steam cleaning area will be analyzed for VOCs, SVOCs, TPHd, metals, and TOG. Soil samples from soil borings 05-HA01 and 05-HA02 along the southeast corner will be analyzed for TPHd, TOG, and BTEX.

Groundwater samples from the four deep soil borings will be analyzed for TPHd, TPHg, TOG, pH, metals, VOCs, and SVOCs. This will assist in identifying any COPCs which may have migrated on site from other nearby potential sources, such as between building IA-12 and building IA-16 where 4 USTs are located, as well as to help identify on-site COPCs.

5.5 SWMU 7 - BUILDING IA-16

Investigations at SWMU 7 will include the paint locker, the northeast side of building IA-16, and the four USTs located between buildings IA-12 and IA-16. No soil borings will be advanced inside building IA-16 because the floor is concrete and intact and no spills or leaks are known to have occurred.

A total of five shallow and four deep (advanced to groundwater, approximately 20 feet bgs) soil borings are proposed. Figure 13 shows the approximate locations of all the soil borings. Groundwater samples will be collected from all deep soil borings. The soil and groundwater sampling activities and analysis rationale are described below.

5.5.1 Soil Sampling

Three shallow soil borings (07-HA03, 07-HA04, and 07-HA05) will be advanced adjacent to the paint locker. Some paint staining was noted during the site visits. This area may have been repaved which may mask more highly stained areas or areas of degraded or cracked asphalt. Because past operations are unknown and the extent of any past spills is not known, the shallow soil borings will be located where the highest amount of staining is now evident.

Two shallow soil borings (07-HA01 and 07-HA02) and one deep soil boring (07-SB04) will be advanced along the north wall of building IA-16. An area approximately 10 by 40 feet was noted to be highly stained, and the asphalt was cracked and degraded. One shallow soil boring will be advanced at each end of the stained area, and the deep soil boring will be advanced in the center of that area.

Three deep soil borings (07-SB01, 07-SB02, and 07-SB03) will be advanced in the vicinity of the USTs. Data from previous investigations at building IA-6 (FM 1993) and building 178 (PRC 1994) indicated groundwater flow is in a northwest direction. One of the deep soil borings (07-SB01) will be located downgradient, but no more than 10 feet from the edge of UST No. 1. A second soil boring (07-SB03) will be located upgradient, northeast of the USTs, but no more than 10 feet from the edge of UST No. 4. A third soil boring (07-SB-02) will be located downgradient, but no more than 10 feet from the edge of UST No. 2. Analytical results for soil samples from the first two soil borings will be used to determine whether the USTs have leaked COPCs into subsurface soils.

5.5.2 Groundwater Sampling

Groundwater samples will be collected from the four deep soil borings using either a HydroPunch or Geoprobe sampler. The analytical results will be used to determine whether groundwater has been impacted by COPCs. The rationale for the locations of the soil borings is discussed in Section 5.5.1. No monitoring wells will be installed since past precision testing and inventory control of the four USTs show no leakage has occurred. The groundwater samples from the soil borings will be collected to confirm that no leakage has occurred.

5.5.3 Analytical Parameters

No past analytical data is available for this SWMU. Based on past operations at building IA-16, COPCs may include metals, VOCs, and petroleum hydrocarbons.

Soil samples from the shallow soil borings and the deep soil boring along the northeast wall of Building IA-16 and the paint locker will be analyzed for metals and VOCs. These are the COPCs that would be associated with the paint and paint thinners used in the building. Soil samples from the deep soil borings located in the vicinity of the four USTs will be analyzed for TPHd, TPHg, and BTEX. Groundwater samples will be analyzed for VOCs, TPHd, TPHg, and metals.

5.6 SWMUs 12 AND 20 - BUILDINGS IA-24 AND IA-55

The investigation at SWMUs 12 and 20 will include the two septic tanks and the drain field located south of building IA-24. Two septic tanks are adjacent to each other and service building IA-24 and building IA-55. The areas around building IA-24, building IA-55, and Seal Creek are being investigated under the IRP (PRC/Montgomery Watson 1994), and therefore will not be included in this SI.

A total of four shallow and three deep (advanced to 15 feet bgs) soil borings are proposed. Figure 14 shows the locations of the soil borings. The soil sampling activities and analysis rationale are described below. In addition, one sludge and one liquid sample will also be taken from each of the septic tanks to determine the presence of COPCs within the septic tank system.

5.6.1 Soil Sampling

Four shallow soil borings (12/20-HA01, 12/20-HA02, 12/20-HA03, and 12/20-HA04) will be advanced along the drain fields as described in the drain field sampling rationale presented in Section 5.1.

One deep soil boring (12/20-SB03) will be advanced between the two septic tanks. Because the septic tanks are made of concrete, it is possible that cracks may have developed in the walls or floor of the septic tanks resulting in leakage into the subsurface.

One deep soil boring (12/20-SB02) will be advanced at the center of the combined drain field. Analytical data for soil samples from this soil boring will be used to determine whether COPCs have migrated vertically into soils underlying this area.

One deep soil boring (12/20-SB01) will be advanced between the septic tanks and Seal Creek. The elevation drops steeply between the drain field and the bottom of Seal Creek, thus COPCs may have migrated into Seal Creek. Analytical results for soil samples from the soil boring will be used to determine whether such migration has taken place.

5.6.2 Analytical Parameters

Building IA-24 is used for forklift maintenance and building IA-55 is used for issuing tools and supplies and is a breakroom and lunch room for field workers. Past operations at building IA-24 and building IA-55 indicate that solvents, paints, and battery acid may have been discharged into the septic tank system. The only COPCs detected during past septic tank sampling were TOG. TOG was also detected in Seal Creek adjacent to the steam cleaner discharge outfall during the IR site investigation.

Based on analytical data and past operations, the COPCs may include VOCs, TOG, SVOCs, and metals. All soil, liquid, and sludge samples will be analyzed for these COPCs. In addition, because battery acid may have been discharged into the septic tank system, soil, liquid, and sludge samples will be analyzed for pH.

5.7 SWMU 13 - BUILDING IA-25

The investigation at SWMU 13 will include the septic tank, drain field, and pit drainage outfall area. The UST located at building IA-19 will not be investigated since it was recently replaced and soil contamination was not detected. The area beneath building IA-25 will not be investigated because previous investigations have already indicated the presence of COPCs. Refer to Section 4.2.6 for a discussion of previous investigations at building IA-25.

A total of three shallow and three deep (advanced to 15 feet bgs) soil borings are proposed. Figure 15 shows the approximate locations of the soil borings. One surface water sample will be collected at the pit drain outfall. The soil and surface water sampling activities and analysis rationale are described below. In addition, one sludge and one liquid sample will also be taken from the septic tank to determine the presence of COPCs within the septic tank system.

5.7.1 Soil Sampling

Two shallow (13-HA01 and 13-HA03) and two deep (13-SB01 and 13-SB02) soil borings will be advanced as described in the septic tank and drain field sampling rationale presented in Section 5.1

One deep (13-SB03) and one shallow (13-HA02) soil boring will be advanced in the vicinity of the pit drainage outfall. It is believed that this drain originates from underneath building IA-25 and drains any rainwater that becomes trapped beneath the building. Since past investigations have revealed the presence of COPCs beneath building IA-25, it is possible that COPCs may have been carried out from under the building by means of the drain. The deep soil boring will be advanced at the outfall of the pit drain. A shallow soil boring will be advanced approximately 40 feet to the north. An aerial photograph dated May 18, 1982, shows an area where drainage may have occurred extending approximately 50 feet away from the drain.

5.7.2 Surface Water Sampling

One surface water sample (13-SW01) will be collected at the outfall of the pit drain. The exact location will be determined during field activities because it is uncertain whether any surface water will be present. The pit outfall drains water from beneath building IA-25. It is possible that when it rains COPCs are washed out from beneath the building.

5.7.3 Analytical Parameters

Building IA-25 was previously used for ordnance reconditioning. COPCs detected in the septic tank during previous sampling were TOG, di-n-octyl phthalate, 4-methylphenol, 1,4-dichlorobenzene, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, total 1,2-dichloroethene, trichloroethene, and toluene. Past operations at building IA-25 indicate that solvents, explosives, paints, and petroleum hydrocarbons may have been discharged into the septic tank system or pit drain.

Based on analytical data and past operations, the COPCs may include VOCs, SVOCs, metals, TOG, and explosives (including PETN, lead styphnate, lead azide, and RDX). Therefore, all soil, liquid, surface water, and sludge samples will be analyzed for these COPCs. In addition, because pesticides were detected in soil samples from beneath building IA-25, soil samples from soil borings 13-SB03 and 13-HA02 and surface water sample 13-SW01 will be analyzed for pesticides/PCBs.

5.8 SWMU 14 - BUILDING IA-27

Investigations at SWMU 14 will include the septic tank adjacent to building IA-44, the drain field, and adjacent areas along the Seal Creek stream bed. Since no history of releases was noted in the RFA, no investigation will be conducted in or around building IA-27.

A total of five shallow and three deep (advanced to 15 feet bgs) soil borings are proposed. Figure 16 shows the approximate locations of all soil borings. The soil sampling activities and analysis rationale are described below. In addition, one sludge and one liquid sample will also be taken from the septic tank to determine the presence of COPCs within the septic tank system.

5.8.1 Soil Sampling

Two shallow (14-HA01 and 14-HA02) and two deep (14-SB01 and 14-SB02) soil borings will be advanced as described in the septic tank and drain field sampling rationale presented in Section 5.1

Three shallow soil borings (14-HA03, 14-HA04, and 14-HA05) will be advanced along the bottom of Seal Creek. A drainage channel into Seal Creek from the drain field is evident along the west side of the drain field. One shallow soil boring will be advanced where the drainage channel intersects Seal Creek. The other two shallow soil borings will be spaced at 50-foot intervals along the bottom of Seal Creek in a downstream direction or at the intersection of any additional drainage with Seal Creek and in low areas where water accumulates.

One deep soil boring (14-SB03) will be advanced between the drain field and Seal Creek because COPCs may have migrated into Seal Creek. Seal Creek is at an elevation approximately 20 feet lower than the drain field, the edge of the drain field is approximately 40 feet from Seal Creek, and drainage channels have cut approximately to the edge of the drain field.

5.8.2 Septic Tank Sampling

Attempts will be made to collect water and sludge samples. During previous sampling attempts, the septic tank was dry. The last attempt occurred during August 1993, the driest period of the year. Also, building IA-27 is not now being used.

5.8.3 Analytical Parameters

Building IA-27 is the former carpenters shop. Past operations at building IA-27 have included the use of paints and paint thinners. According to the RFA, it is possible that small quantities were discharged into the septic tank system. COPCs may include VOCs and metals. Other COPCs could also include SVOCs and TOG, as is evident from sampling other septic tanks. Therefore, all soil, liquid, and sludge samples will be analyzed for VOCs, SVOCs, metals, and TOG.

5.9 SWMU 15 - BUILDING IA-41

Building IA-41 was reported in the RFA to have a sink and sanitary sewer system that drained into a septic tank. However, no septic tank was noted during previous sampling events, nor was evidence of a septic tank discovered during site visits and a review of available engineering drawings at WPNSTA Concord.

A total of three shallow soil borings are proposed. Figure 17 shows the approximate locations of the soil borings. The soil sampling activities and analysis rationale are described below.

5.9.1 Soil Sampling

The floor of the building is cracked. Because paints and paint thinners may have leaked to the soils through the cracks, one shallow soil boring (15-HA03) will be advanced through the floor. Two shallow soil borings (15-HA01 and 15-HA02) will also be advanced outside the door of the building where paint or paint thinners may have been dumped.

5.9.2 Analytical Parameters

Building IA-41 was used for paint storage. The RFA stated that past operations at building IA-41 indicate that solvents and paints may have been discharged into the soil.

Based on past operations, the COPCs may include VOCs, SVOCs, and metals. Therefore, all soil and water samples will be analyzed for these COPCs.

5.10 SWMU 16 - BUILDING IA-46

Investigations at SWMU-16 will include the areas in front of building IA-46 and the former pesticide storage and mixing area. No investigations will be performed in the fluorescent light tube crushing room because no mercury residues were noted during the site visits. The operation is contained and any mercury vapors that might escape would dissipate into the atmosphere. Mercury residues would likely be attached to pieces of the crushed fluorescent light tubes. No spills of crushed fluorescent light tubes have been noted. No other areas of concern were noted in the RFA.

A total of five shallow and one deep (advanced to 15 feet bgs) soil borings are proposed. Figure 18 shows the approximate locations of the soil borings. The soil sampling activities and analysis rationale are described below.

5.10.1 Soil Sampling

Three shallow soil borings (16-HA01, 16-HA02, and 16-HA03) will be drilled along the south boundary fence. The soil borings will be advanced in areas were asbestos is present or where staining is apparent. The exact locations will be determined during preliminary field activities.

Two shallow (16-HA04 and 16-HA05) and one deep (16-SB01) soil borings will be advanced along the west edge of building IA-46. The RFA described a storage shed along the west side of building IA-46 as a former storage area for asbestos. The storage shed is no longer present. Asbestos was packed here, and spills may have occurred. This is also the former pesticide storage and mixing building. Pesticides were noted to have been spilled into the drainage adjacent to D Street. The two shallow soil borings will be advanced in the paved area where visible staining is evident. The deep soil boring will be drilled where staining is the most visible. A soil sample will also be collected from the deep soil boring at 0 to 0.5 feet bgs.

5.10.2 Analytical Parameters

Building IA-46 is a public works maintenance storage building. The RFA stated that past operations indicate that asbestos and pesticides are COPCs. Shallow soil borings adjacent to the south fence will be analyzed for asbestos. The two shallow and one deep soil boring in the vicinity of the former building where asbestos was stored and pesticides were mixed and stored will be analyzed for pesticides/PCBs, metals, arsenic, and asbestos.

5.11 SWMU 17 - BUILDING IA-50

Investigations at SWMU 17 will include the septic tank, drain field, and area between the drain field and Seal Creek. No sampling will be conducted along Seal Creek because of the large distance between the drain field and Seal Creek. Since no history of releases was noted in the RFA, no investigations will be conducted in or around building IA-50.

A total of two shallow and three deep (advanced to 15 feet bgs) soil borings are proposed. Figure 19 shows the approximate locations of all the soil borings. The soil sampling activities and analysis rationale are described below. In addition, one sludge and one liquid sample will also be taken from the septic tank to determine the presence of COPCs within the septic tank system.

5.11.1 Soil Sampling

Two shallow (17-HA01 and 17-HA02) and two deep (17-SB01 and 17-SB02) soil borings will be advanced as described in the septic tank and drain field sampling rationale presented in Section 5.1

One deep soil boring (17-SB03) will be advanced between the drain field and Seal Creek. Seal Creek is approximately 100 feet from the edge of the drain field and is approximately 20 feet lower in elevation. It is possible that COPCs may have migrated toward Seal Creek along migration pathways. Analytical results for soil samples from the soil borings will be used to determine whether COPCs have migrated laterally toward Seal Creek.

5.11.2 Analytical Parameters

Building IA-50 is a rail and truck transfer depot. COPCs detected in the septic tank during previous sampling were TOG, 1,4-dichlorobenzene, benzene, and chlorobenzene. The RFA stated that past operations indicate that paints may have been discharged into the septic tank system.

Based on analytical data and past operations, COPCs may include VOCs, SVOCs, TOG, and metals. All soil, liquid, and sludge samples will be analyzed for these COPCs.

5.12 SWMU 18 - BUILDING IA-51

Investigations at SWMU 18 will include the former sump, the former turntable, and the storm drain outfall into Seal Creek. The RFA states that during 1987 chromates were detected in Seal Creek. These were traced back to zinc chromate rust inhibitor that was added to engine antifreeze.

A total of four shallow and two deep (advanced to groundwater, approximately 20 feet bgs) soil borings are proposed. Figure 20 shows the approximate locations of the deep soil borings, and Figure 33 shows the approximate locations of the shallow soil borings. Groundwater samples will be collected from the deep soil borings. Two surface water samples will also be collected, if surface water is evident, during field sampling. The soil and groundwater sampling activities and analysis rationale are described below.

5.12.1 Soil Sampling

One deep soil boring (18-SB01) will be advanced as close to the former sump as practicable. Because of the age of the concrete sump, the possibility exists that cracks may have occurred in the floor or walls of the sump, allowing COPCs to leak into the subsurface.

One deep soil boring (18-SB02) will be advanced in the area of the former turntable. As discussed in Section 4.2.11, an incinerator was once located in the excavation for the turntable. Classified documents were reported to have been destroyed at the site, but no record is known of any other activities. The soil boring will be advanced in the approximate location of the incinerator as it appears in the 1976 aerial photograph.

Four shallow soil borings (18-HA01, 18-HA02, 18-HA03, and 18-HA04) will be advanced along the storm drainage outfall south and east of building IA-8 (refer to Figure 33). It is suspected that storm water from the building IA-51 area flowed into this drainage. The soil borings will be spaced along the drainage in low areas where water accumulates. The locations of the soil borings will be determined during preliminary field activities.

5.12.2 Groundwater Sampling

Groundwater will be sampled from the two deep soil borings using either a HydroPunch or Geoprobe sampler. The rationale for each location is discussed in Section 5.12.1.

5.12.3 Surface Water Sampling

Two surface water samples (18-SW01 and 18-SW02) will be collected if surface water is present during field activities. The locations will be determined during field activities. The surface water samples will collected to determine whether COPC are migrating offsite with the storm drain water. It is possible that storm water runoff may have washed COPCs into the drainage.

5.12.4 Analytical Parameters

Building IA-51 was used for steam cleaning locomotives and trucks and for general maintenance of vehicles. Waste generated included oily waste and antifreeze. Based on the past operations, COPCs include TPHd, TOG, BTEX, and metals. All soil samples from deep soil borings will be analyzed for these COPCs. In addition, because the past operations of the incinerator are unclear, soil samples from the soil boring in the turntable area will also be analyzed for VOCs and SVOCs. Soil samples from the shallow soil borings will be analyzed for metals.

All groundwater samples will be analyzed for TPHd, TOG, metals, VOCs, and SVOCs. This will assist in evaluating whether off-site sources of COPCs exist. Surface water samples will be analyzed for metals.

5.13 SWMU 20 - BUILDING IA-55

The septic tanks for SWMU 12 and SWMU 20 are located adjacent to each other. Because of their proximity to each other and their common influent line, they have been treated as one SWMU for the purpose of this investigation. For a discussion of the proposed investigation, refer to Section 5.6.

5.14 SWMU 22 - BUILDING 81

Investigations at SWMU 22 will include the septic tank and drain field. The area located between buildings 83 and 86 where three USTs exist will not be investigated, since these USTs are scheduled to be removed and replaced under a separate program. Because no history of releases was noted in the RFA, no investigations will be conducted in or around building 81.

A total of seven shallow and two deep (advanced to 15 feet bgs) soil borings are proposed. Figure 21 shows the approximate locations of all the soil borings. One surface water sample will also be collected. The sampling activities and analysis rationale are described below. In addition, one sludge and one liquid sample will be taken from the septic tank to determine the presence of COPCs within the septic tank system.

5.14.1 Soil Sampling

Four shallow (22-HA01, 22-HA02, 22-HA03, and 22-HA04) and two deep (22-SB01 and 22-SB02) soil borings will be advanced as described in the septic tank and drain field sampling rationale presented in Section 5.1.

Three shallow (22-HA05, 22-HA06, and 22-HA07) shallow soil borings will be advanced along the drainage south of the septic tank. Building 81 is still active. It is possible that COPC may have leaked out of the septic tank or from the drain field into the drainage ditch. The soil borings will be advanced to 5 feet bgs. Soil samples will be collected from 0 to 0.5 feet and 5 to 5.5 feet bgs.

5.14.2 Surface Water Sampling

One surface water sample (22-SW01) will be collected during field activities, if surface water is present. The location of the surface water sample will be determined during field activities. It is possible that storm water may have washed COPCs down the drainage.

5.14.3 Analytical Parameters

Building 81 is used for ordnance maintenance. COPCs detected during sampling of the septic tank were TOG, 1,4-dichlorobenzene, 4-methylphenol, and total 1,2-dichloroethene. The RFA stated that past operations at building 81 indicate that paints, explosives, and solvents may have been discharged into the septic tank system.

Based on analytical data and past operations, the COPCs may include explosives (PETN and RDX), VOCs, SVOCs, TOG, and metals. All soil, liquid, surface water, and sludge samples will be analyzed for these COPCs.

5.15 SWMU 23 - BUILDING 87

Investigations at SWMU 23 will include the septic tank, drain field, and the UST adjacent to the leach field. This UST is scheduled to be removed under a separate program. Because it is adjacent to the leach field, however, it will be investigated to determine whether leakage has occurred that may impact results from the sampling in the drain field. Since no history of releases from building 87 was reported in the RFA, no investigations will be conducted in or around building 87.

A total of four shallow and three deep (advanced to 15 feet bgs) soil borings are proposed. Figure 22 shows the locations of the soil borings. The soil sampling activities and analysis rationale are described below. In addition, one sludge and one liquid sample will also be taken from the septic tank to determine the presence of COPCs within the septic tank system.

5.15.1 Soil Sampling

Four shallow (23-HA01, 23-HA02, 23-HA03, and 23-HA04) and two deep (23-SB01 and 23-SB02) soil borings will be advanced as described in the septic tank and drain field sampling rationale presented in the introductory portion of Section 5.1. The asphalt will be cored to the top of the ground surface before sampling begins.

One deep soil boring (23-SB03) will be advanced to within 5 feet of the edge of the UST, between the drain field and the UST. No tank testing data is available to confirm that the tank has or has not leaked. Information obtained will be used to determine whether COPCs have migrated from the UST into the drain field.

5.15.2 Analytical Parameters

Building 87 has been used as a storage facility for inert materials and as a missile maintenance building. It is currently used for inspecting and performing minor maintenance on various ordnance. COPCs detected during past sampling of the septic tank were TOG, benzoic acid, 4-methylphenol, bis(2-ethylhexyl)phthalate, butyl benzyl phthalate, diethyl phthalate, and phenol. The RFA stated that past operations indicate that paints, petroleum hydrocarbons, and solvents may have been discharged into the septic tank system.

Based on analytical data and past operations, COPCs may include VOCs, SVOCs, TOG, and metals. All soil, liquid, and sludge samples will be analyzed for these COPCs. In addition, because of the proximity to the diesel UST, soil samples from soil boring 23-SB03 will be analyzed for TPHd.

5.16 SWMU 24 - BUILDING 93

Investigations at SWMU 24 will include the septic tank and drain field. Since no history of releases from building 93 was noted in the RFA, no investigations will be conducted in or around building 93.

A total of four shallow and two deep (advanced to 15 feet bgs) soil borings are proposed. Figure 23 shows the approximate locations of the soil borings. The soil sampling activities and analysis rationale are described below. In addition, one sludge and one liquid sample will also be taken from the septic tank to determine the presence of COPCs within the septic tank system.

5.16.1 Soil Sampling

Four shallow (24-HA01, 24-HA02, 24-HA03, and 24-HA04) and two deep (24-SB01 and 24-SB02) soil borings will be advanced as described in the septic tank and drain field sampling rationale presented in the introductory portion of Section 5.1.

5.16.2 Analytical Parameters

Building 93 formerly housed the guided missile division and most recently has been used for ordnance inspection and minor maintenance. COPCs detected during past sampling of the septic tank were TOG, 4-methylphenol, toluene, and phenol. The RFA stated that past operations may have resulted in paints, solvents, or adhesives being discharged into the septic tank system.

Based on the analytical data and past operations, COPCs may include VOCs, SVOCs, TOG, and metals. All soil, liquid, and sludge samples will be analyzed for these COPCs.

5.17 SWMU 25 - BUILDING 97

Investigations at SWMU 25 will include the septic tank and drain field. The area around the location of the three former USTs adjacent to building 97 will not be investigated, since no petroleum hydrocarbons were detected in soil samples during removal activities. The UST next to the guard house will not be investigated because it has been removed and replaced under a separate program. Since no history of releases was noted in the RFA, no investigations will be conducted in or around building 97.

A total of four shallow and two deep (advanced to 15 feet bgs) soil borings are proposed. Figure 24 shows the approximate locations of the soil borings. The soil sampling activities and analysis rationale are described below. In addition, one sludge and one liquid sample will also be taken from the septic tank to determine the presence of COPCs within the septic tank system.

5.17.1 Soil Sampling

Four shallow (25-HA01, 25-HA02, 25-HA03, and 25-HA04) and two deep (25-SB01 and 25-SB02) soil borings will be advanced as described in the septic tank and drain field sampling rationale presented in Section 5.1.

5.17.2 Analytical Parameters

Building 97 is an ordnance assembly building. COPCs detected during past septic tank sampling were TOG, 1,4-dichlorobenzene, 4-methylphenol, and phenol. The RFA stated that past operations at building 97 indicate that paint, petroleum hydrocarbons, solvents, and adhesives may have been discharged into the septic tank system.

Based on analytical data and past operations, COPCs would include VOCs, SVOCs, TOG, and metals. All soil, liquid, and sludge samples will be analyzed for these COPCs.

5.18 SWMU 37 - BUILDING A-29

The investigation at SWMU 37 will include the fenced dunnage area which is not included under the IRP.

Ten shallow and two deep (advanced to 15 feet bgs) soil borings are proposed. Groundwater samples will be collected from the two deep soil borings. Figure 25 shows the approximate locations of the proposed soil borings. The soil and groundwater sampling activities and analysis rationale are described below.

5.18.1 Soil Sampling

Because the area is covered by piles of wood, soil borings will be restricted to areas where access is possible. Seven shallow soil borings (37-HA01, 37-HA02, 37-HA03, 37-HA04, 37-HA05, 37-HA06, and 37-HA07) will be located between wood piles, in areas where staining is evident, and in areas where wood may have been stored on soil. No attempt will be made to move wood piles to locate soil borings.

Two shallow soil borings 37-HA08 and 37-HA09 will be located adjacent to the west side of building A-29. This is where hazardous materials were stored in the past. Shallow soil boring 37-HA10 will be located within the scrap metal storage area.

Two deep soil borings (37-SB01 and 37-SB02) will be advanced to 5 feet below the groundwater table. Soil boring 37-SB01 will be located adjacent to the west end of building A-29. Treated wood was stored in this area. Soil boring 37-SB02 will be located along the north boundary of the dunnage area. No investigations were previously conducted along the north boundary with the wood hogger site. It is possible that COPCs have migrated to the north. Soil samples will be collected at 0 to 0.5 feet bgs, 5 to 5.5 feet bgs, and at the water table.

5.18.2 Groundwater Sampling

Groundwater samples will be collected from the two deep soil borings. The groundwater sample will be collected using either Geoprobe or HydroPunch sampling methods.

5.18.3 Analytical Parameters

Soil and groundwater samples will be analyzed for VOCs, SVOCs, pesticides/PCBs, explosive compounds, metals, TOC, and pH. Groundwater samples will also be analyzed for conductivity and soil samples for sulfates. These are the same parameters for which soil samples collected during the IRP at the Wood Hogger site are being analyzed. This will allow for a simple transition of SWMU 37 into the IRP if warranted.

5.19 SWMU 40 - BUILDING 174

The investigation at building 174 will include the area around the building, the drainage along the east side of the building, and inside the building where the transformers were stored. The site visit did not reveal any evidence of soil staining inside or around the building. However, the inside of the building could not be accessed, and the entire floor was not visible through the windows.

A total of three shallow soil borings are proposed. Figure 26 shows the approximate locations of the soil borings. The soil sampling activities and analysis rationale are described below.

5.19.1 Soil Sampling

One shallow soil boring (40-HA02) will be advanced inside building 174. The locations will be selected based on apparent staining, evidence of cracks, or the slope direction of the floor. One shallow soil boring (40-HA01) will be advanced around the perimeter of building 174. The boring will be located along the side of the building where staining was noted inside the building.

Because it is possible that COPCs may have been washed into the drainage by rainwater or migration through soil, one shallow soil boring (40-HA03) will be advanced in the drainage along the east side of the building. The soil boring will be located in the lowest area in the drainage where water will collect. If the drainage is flooded, the sample location will be moved to the east side of building 174.

5.19.2 Analytical Parameters

All soil samples will be analyzed for PCBs, TPHd, and BTEX. These are COPCs typically associated with transformers which contain oil and PCBs.

5.20 SWMU 44 - BUILDING 350

Investigations at SWMU 44 will include the septic tank and drain field. Since no history of releases was noted in the RFA, no investigations will be conducted in or around building 350. The USTs located at the building will not be investigated because they are being investigated under a separate UST removal activity.

A total of two shallow and two deep (advanced to 5 feet below the groundwater table, approximately 15 feet bgs) soil borings are proposed. Figure 27 shows the approximate locations of the soil borings. The soil and groundwater sampling activities and analysis rationale are described below. In addition, one sludge and one liquid sample will also be taken from the septic tank to determine the presence of COPCs within the septic tank system.

5.20.1 Soil Sampling

Two shallow soil borings (44-HA01 and 44-HA02) and two deep soil borings (44-SB01 and 44-SB02) will be advanced as described in the septic tank and drain field sampling rationale presented in Section 5.1. Soil samples will be collected at 5.0 feet bgs and at the water table from each deep soil boring.

5.20.2 Groundwater Sampling

Groundwater samples will be collected from the two deep soil borings. This area is environmentally sensitive because of the proximity to wetlands areas. One soil boring (44-SB01) will be located adjacent to the septic tank because it is possible that the septic tank may have leaked. The second soil boring (44-SB02) will be placed in the center of the drain field.

5.20.3 Analytical Parameters

Building 350 is a high-security building for special weapons. COPCs detected during past sampling of the septic tank were TOG, 4-methylphenol, toluene, and 1,4-dichlorobenzene. The RFA stated that past operations may have resulted in paints, solvents, or adhesives being discharged into the septic tank system.

Based on the analytical data and past operations, COPCs may include VOCs, SVOCs, TOG, TPHd, and metals. All soil, liquid, and sludge samples will be analyzed for these COPCs.

5.21 SWMU 50 - BUILDING E-108

The area around former building E-108 will be investigated. A geophysical survey will first be attempted so that the UST (if present) can be located. Two deep soil borings will be advanced to groundwater (estimated to be 10 feet bgs) within the investigation area. Two additional soil borings will be advanced downgradient, and monitoring wells will be installed. Figure 28 shows the approximate locations of the monitoring wells and the area of the geophysical survey. The soil and groundwater sampling activities and analysis rationale are described below.

5.21.1 Geophysical Survey

A geophysical survey will cover approximately 60 by 100 feet around former building E-108. Transects will be spaced at 10-foot intervals. Section 6.1.2 describes the methods to be used to conduct the geophysical survey.

5.21.2 Soil Sampling

The locations of the deep soil borings (50-SB01 and 50-SB02) will be determined by the results of the geophysical survey. If a UST is located, the soil borings will be advanced within 10 feet of the UST. If no UST is located, the soil borings will be located in the vicinity of the sample where petroleum hydrocarbons were detected.

Two deep soil borings (50-MW01 and 50-MW02) will be located north of the former boiler house (building E-108). Groundwater flow is toward the north. The locations will be outside the area where the geophysical survey will be performed. The deep soil borings will be advanced to 7 feet below the groundwater table and converted into monitoring wells.

5.21.3 Groundwater Sampling

Water samples will be collected from the two new monitoring wells (50-MW01 and 50-MW02) and monitoring well MW-1, adjacent to UST E-85. The groundwater gradient and flow direction will be determined from hydrogeologic data obtained from these wells. The presence of COPCs downgradient of former building E-108 will be determined.

5.21.4 Analytical Parameters

Analytical data from previous sampling indicated the presence of TOG and TPHd in soil and TOG in groundwater. All soil and groundwater samples will be analyzed for TPHd, TOG, and BTEX.

5.22 SWMU 51 - BUILDING IA-56

Investigations at SWMU 51 will include the septic tank and old drain field. The drain field was replaced in 1991; because the new drain field has had minimal use since 1991, it will not be investigated. Since no history of releases from building IA-56 has been documented, no investigations will be conducted in or around building IA-56.

A total of four shallow and two deep (advanced to 15 feet bgs) soil borings are proposed. Figure 29 shows the approximate locations of the soil borings. The soil sampling activities and analysis rationale are described below. In addition, one sludge and one liquid sample will also be taken from the septic tank to determine the presence of COPCs within the septic tank system.

5.22.1 Soil Sampling

Four shallow (51-HA01, 51-HA02, 51-HA03, and 51-HA04) and two deep (51-SB01 and 51-SB02) soil borings will be advanced as described in the septic tank and drain field sampling rationale presented in Section 5.1.

5.22.2 Analytical Parameters

Building IA-56 is used as a forklift training school. COPCs detected during sampling of the septic tank were 4-methylphenol, benzoic acid, and phenol. The past operations at building IA-56 indicate that paints and solvents may have been discharged into the septic tank system.

Based on analytical data and past operations, the COPCs may include VOCs, SVOCs, TOG, and metals. All soil, water and sludge samples will be analyzed for these COPCs.

5.23 SWMU 52 - BUILDING 7SH5

Investigations at SWMU 52 will include the septic tank, drainage ditch to the west, and the drain field. Since the area around building 7SH5 is being investigated under the IRP, no other investigations will be conducted around the building.

A total of six shallow and two deep (advanced to 15 feet bgs) soil borings are proposed. Figure 30 shows the approximate locations of the soil borings. One surface water sample will also be collected, if surface water is present. The soil sampling activities and analysis rationale are described below. In addition, one sludge and one liquid sample will also be taken from the septic tank to determine the presence of COPCs within the septic tank system.

5.23.1 Soil Sampling

Four shallow (52-HA01, 52-HA02, 52-HA03, and 52-HA04) and two deep (52-SB01 and 52-SB02) soil borings will be advanced as described in the septic tank and drain field sampling rationale presented in Section 5.1.

Two shallow soil borings (52-HA05 and 52-HA06) will be advanced along the drainage ditch to the west. The drainage ditch is approximately 5 feet lower than the leach field. It is possible that drainage from the leach field into the drainage ditch may have occurred. The soil borings will be spaced along the drainage ditch and located in low areas where water accumulates.

5.23.2 Surface Water Sampling

One surface water sample (52-SW01) will be collected during the field activities, is surface water is present. The location of the surface water sample will be determined during field activities. The purpose of the surface water sample is to investigate the possibility that liquids migrated from the septic tank or drain field into the adjacent drainage ditch.

5.23.3 Analytical Parameters

Building 7SH5 was previously used as a missile wing and fin repair facility. COPCs detected during sampling of the septic tank were TOG, 1,4-dichlorobenzene, 4-methylphenol, napthalene, benzoic acid, toluene, total 1,2-dichloroethene, and phenol.

Based on analytical data and past operations, the COPCs may include VOCs, SVOCs, TOG, and, metals. All soil, liquid, surface water, and sludge samples will be analyzed for these COPCs.

5.24 SWMU 53 - BUILDING 7SH14

Investigations at SWMU 53 will include the septic tank and drain field. The UST along the west side of building 7SH14 will not be investigated because it is being removed under a separate program and soils will be characterized at that time.

A total of four shallow and two deep (advanced to 15 feet bgs) soil borings are proposed. Figure 31 shows the approximate locations of the soil borings. The soil sampling activities and analysis rationale are described below. In addition, one sludge and one liquid sample will also be taken from the septic tank to determine the presence of COPCs within the septic tank system.

5.24.1 Soil Sampling

Four shallow (53-HA01, 53-HA02, 53-HA03, and 53-HA04) and two deep (53-SB01 and 53-SB02) soil borings will be advanced as described in the septic tank and drain field sampling rationale presented in Section 5.1.

5.24.2 Analytical Parameters

Building 7SH14 is being used as a training facility. Only TOG was detected during sampling of the septic tank. The past operations at building 7SH14 indicate that paints and solvents may have been discharged into the septic tank system.

Based on analytical data and past operations, the COPCs may include VOCs, SVOCs, TOG, and metals. All soil, liquid, and sludge samples will be analyzed for these COPCs.

5.25 SWMU 54 - BUILDING 79

Investigations at SWMU 54 will include the septic tanks and drain fields. Two septic tanks and associated drain fields are located at the SWMU. A septic tank and drain field were abandoned in 1978 and a new septic tank and drain field were installed.

A total of eight shallow and four deep (advanced to 15 feet bgs) soil borings are proposed. Figure 32 shows the approximate locations of the soil borings. The soil sampling activities and analysis rationale are described below. In addition, one sludge and one liquid sample will also be taken from each septic tank to determine the presence of COPCs within the septic tank system.

5.25.1 Soil Sampling

Four shallow (54-HA01, 54-HA02, 54-HA03, and 54-HA04) and two deep soil borings (54-SB01 and 54-SB02) will be advanced in the area of the old drain field and septic tank and four shallow (54-HA05, 54-HA06, 54-HA07, and 54-HA08) and two deep soil borings (54-SB03 and 54-SB04) will be advanced in the area of the new drain field and septic tank as described in the septic tank and drain field sampling rationale in Section 5.1.

5.25.2 Analytical Parameters

Building 79 was used as a reaction fast force facility. COPCs detected during previous septic tank sampling were TOG, 1,3-dichlorobenzene, and 2,4-dichlorophenol. The past operations at building 79 lead to suppositions that solvents and cleaning fluids may have been discharged into the septic tank system.

Based on analytical data and past operations, the COPCs may include VOCs, SVOCs, TOG, and metals. All soil, liquid, and sludge samples will be analyzed for these COPCs.

6.0 SAMPLING EQUIPMENT AND PROCEDURES

The planned investigation at WPNSTA Concord includes: (1) surface soil sampling at 24 sites, (2) subsurface sampling from soil borings at 23 sites, (3) test pit excavation and sampling at 1 site, (4) sampling of existing groundwater monitoring wells at 3 sites, (5) HydroPunch groundwater sampling at 3 sites, (6) monitoring well installation and sampling at 3 sites, and (7) sampling sludge and liquid from septic tanks at 14 sites. This section presents an overview of the sampling equipment to be used and the procedures to follow during the SI activities. Standard operating procedures (SOP) are used to describe in detail the requirements and techniques associated with many of the field activities. These SOPs are referenced throughout this section and are included in Volume II of this FSP. Table 12 lists the field activities included in this section and references the specific SOP associated with each activity.

During all field activities, personnel will follow field procedures established during reconnaissance activities for the protection of endangered, threatened, or sensitive species. These procedures may include access only via established walkways and notification of the WPNSTA Concord biologist if additional nesting sites or habitat are discovered. All soil, sediment, sludge, liquid, and groundwater samples will be packaged, labeled, and transported as described in the QAPjP.

6.1 UTILITY AND ENVIRONMENTAL CLEARANCE

The planned investigation at WPNSTA Concord will be conducted at 24 sites using various investigative methods. Some of the investigative methods involve invasive type tasks, and care must be exercised to ensure personnel safety with respect to aboveground as well as underground utilities. State and local permitting requirements must also be followed during the site investigation. This section addresses the issue of utility and environmental clearances and permitting.

6.1.1 Utility Clearances

Existing engineering plans, drawings, diagrams, and other information showing underground utilities will be used for selecting the soil boring and monitoring well locations. The selected locations will be initially cleared using ground penetrating radar (GPR), then marked with a stake. After the soil boring and well locations have been staked, WPNSTA Concord will issue a digging permit to PRC after further evaluation of underground utilities in the area. The WPNSTA Concord public works coordinator will also check with the installation planning department concerning any plans for future construction in the vicinity of the boring and well locations. Additionally, the local underground utilities locating service (such as Underground Service Alert (USA)) will be asked to identify and locate any nongovernment lines on government property. Detailed information on aboveground or underground utilities will be obtained during premobilization activities of the field program.

6.1.2 Geophysical Investigations

A geophysical survey will be used as part of the field investigation at SWMU 50 to help locate subsurface features and objects. The geophysical methods to be used are cesium vapor magnetics and GPR. The magnetometer survey will be used to initially screen the site for magnetic anomalies which are characteristic of buried USTs or associated piping. GPR will then be used to obtain a direct scattering profile of the objects responsible for the magnetic anomalies.

GPR will also be used to clear all of the proposed soil boring, monitoring well, and trench locations for the presence of buried utilities or other hazards. The locations will be cleared by obtaining two, 5-foot, perpendicular scattering profiles across each proposed location. When the scattering profiles show no anomalous reading over the proposed location, the geophysicist will approve the location for drilling. If the instrument shows anomalies beneath a proposed borehole location, the borehole will be moved to a nearby location that is clear. Magnetometer and GPR activities are described briefly below.

Magnetometer Survey

A magnetometer is used to measure the strength of the earth's magnetic field. Non-temporal, local variations in the measured magnetic field are created by geologic heterogeneity and/or the presence of buried ferrous materials. The magnetometer that will be used at WPNSTA Concord is a EG&G Geometrics 822L cesium vapor instrument. This type of magnetometer provides high sensitivity and is capable of obtaining accurate measurements in areas having very large magnetic gradients such as in areas with significant amounts of buried material. The magnetometer will be used at SWMU 50 to locate metallic objects in the vicinity of former building E-108.

Ground Penetrating Radar

GPR uses high-frequency radio waves to obtain a scattering profile of shallow subsurface features and conditions. The radar system consists of a control unit, an antenna assembly (transmitter/receiver), and a strip chart printer for recording scattering profiles. The GPR to be used will be a Geophysical Survey Systems SIR-3 ground impulse type. Energy is radiated downward into the subsurface from an antenna that is pulled slowly across the ground over the survey area. This radio wave energy is scattered by electrical interfaces in the subsurface, and scattered energy returning to the surface is processed and displayed as a continuous strip-chart recording of distance versus time, where time is proportional to depth. A 500 megahertz antenna will be used for the work at WPNSTA Concord. The range setting will initially be set at 50 nanoseconds and adjusted based on site specific conditions.

6.1.3 State and Local Permitting

All required State of California and Contra Costa County permits will be obtained for the drilling of soil borings and the installation of monitoring wells at WPNSTA Concord. However, pursuant to the CERCLA permit exemption (Section 121 (e)(i)) the Navy will not pay state and county permit fees. Well records and as-built drawings of the wells will be submitted to the state and county as required.

6.1.4 Environmental Permitting/Clearance

The potential exists for SI activities at WPNSTA Concord to impact endangered, threatened, or sensitive species, and their habitats. Habitat and/or nesting areas near or within SI sites will be identified during the reconnaissance activities before field activities begin. Preliminary site reconnaissance and characterization will be conducted at each SWMU as outlined in SOP No. 001. All activities will be approved by the WPNSTA Concord biologist, who will coordinate with the U.S. Fish and Wildlife Service and the California Department of Fish and Game. Clearance from appropriate agencies will be obtained prior to the initiation of field work.

6.2 SOIL INVESTIGATIONS

Surface and subsurface soil samples will be obtained from all soil borings. Drilling, logging, and retrieval and handling of samples are presented in this section. Hollow-stem auger (HSA) and hand-auger drilling methods will be used in the soil investigation at WPNSTA Concord. Ninety-six soil borings will be hand-augered to a depth of 5 feet bgs and 54 soil borings will be drilled to depths greater than 5 feet bgs using HSA. The sampling rationale and locations of soil borings and monitoring wells are discussed in Section 5.0.

6.2.1 Hollow-Stem Auger Drilling

The soil borings will be drilled with a truck-mounted HSA drill rig using 8-inch outside diameter (OD) or 12-inch OD HSA. Each drill location will be staked during preliminary field activities. Soil boring locations will be selected where access for the truck-mounted drill rig is possible. Locations that are covered with concrete will be diamond-cored. Water used during coring will be suctioned and transferred to a storage container. Alternatively, water may be brushed to the side and allowed to evaporate. The general procedures for HSA drilling are described in SOP No. 045. Sample collection during HSA drilling is discussed in Section 6.2.5 and SOP No. 026.

6.2.2 Hand-Augering

Hand-augering is primarily used to collect soil samples from relatively shallow unconsolidated materials. Generally, hand augers are useful for sampling all types of soil except cohesionless materials below the water table and hard or cemented soils. Hand-augering may be a preferred sampling method when certain conditions prevail, such as when contaminant sources are shallow, when areas are inaccessible to conventional drill rigs, and for quick preliminary studies. The general procedures for hand-augering are described in SOP No. 044.

6.2.3 Geoprobe Sampling

Soil borings may also be advanced using a mobile hydraulically operated probe sampling system (Geoprobe). Soil and groundwater samples can be collected using the Geoprobe system. The Geoprobe will be used for obtaining samples at SWMUs where septic tanks and leach fields are located or as a substitute to HydroPunch groundwater samples described in Section 6.3.4. The general procedures for Geoprobe sampling are described in SOP No. 054.

6.2.4 Surface Soil Sampling

A hand-operated core sampler will be used to obtain surface samples. The core sampler will be pressed into the undisturbed soil. This sampling technique will apply to unsaturated soil samples collected from ditches, drainage channels, or unpaved areas on the sites where surface samples will be collected. SOP No. 005 describes the methodology for surface soil sampling.

6.2.5 Borehole Sampling Methods

Soil samples collected for chemical analysis during HSA drilling will be collected from soil borings at 5-foot intervals, including the water table, at total depth, and where physical signs of contamination are apparent, using a 2.5-inch-diameter modified California split-spoon sampler (ASTM method D 3550-84) with three 6-inch brass liner tubes.

During hand-augering, soil samples for chemical analyses will be collected with a hand sampler fitted with one 6-inch or two 3-inch stainless steel or brass sleeves. If more soil is needed for laboratory analyses, then a second soil sample will be collected by boring adjacent to the first sample.

A small sample of soil from each sample interval or at a noted change in lithology will be placed in a plastic or cardboard partitioned archive box. The archive boxes will be stored on site for the duration of the field program and will be examined as necessary during the interpretation of boring logs and development of geologic descriptions for the SI report.

A geologist will log each soil boring and describe soil types according to the Unified Soil Classification System (USCS), ASTM Method D2488. Figure 34 is an example of the field borelog form to be used. A Munsell or Geological Society of America color chart will be used to describe soil color. Lithologic logging procedures are discussed in SOP No. 026.

6.2.6 Borehole Abandonment

Boreholes will be abandoned by filling the borehole to the surface using a cement-bentonite grout. The cement-bentonite grout will be of the same consistency used to seal off the annular space of a completed monitoring well. The depth of the hole will be measured with a steel tape and the volume of grout calculated to plug the hole. The method used (for example, tremie pipe) to place the grout into the hole will ensure that it is filled from the bottom to the surface. Cement-bentonite grout will be pumped into the hole until it rises to within 5 feet of the land surface. It will then be allowed to set overnight before the remainder of the hole is filled with neat cement. A cement cap will be made over the abandoned borehole that will allow any surface water to drain away from the area. PRC will mark the area of the abandoned borehole for future reference.

6.2.7 Test Pit Investigation

PRC will excavate test pits as part of the SI investigation at SWMU 2 (Fire Station) in the Inland Area. Prior to excavation, the location of each test pit within SWMU 2 will be marked using marking stakes and lines as necessary, and underground utilities will be located by USA and by geophysical methods, as outlined in Section 6.1. The test pits will be excavated according to procedures outlined in SOP No. 005. The pit will be excavated until native material is encountered or a maximum depth of 6 feet. In the event that a utility or sewer line is uncovered, all the excavation operations will be terminated, and the project manager will be notified. The test pit will be relocated to an adjacent area that has been cleared of underground utilities.

Once each test pit has been excavated, PRC will take photographs and prepare a sketch to show test pit dimensions and conditions. The photographs and sketch will show any sample locations, the location of any waste materials, and the location of any features encountered (such as utility or sewer lines). Under no circumstances will any field team member enter the test pits.

Soil samples will be collected from the native material underlying the pit. The objective of this sampling program is to evaluate the presence of any chemicals in the soil below the fill. Soil samples will be collected from any areas of visible contamination and from native soil at the base of the pit, for a maximum of three samples within each test pit. Samples will be collected using a hand-driven sampler. Samples may also be collected from the backhoe bucket.

As each sample is collected, the location of the sample within the test pit will be measured from one corner using a tape measure. The same corner will be used as datum for all samples, and the location of the corner will be surveyed as described in Section 6.5. The location description will include the horizontal distances from the corner and the depth from ground surface. The measurements will be recorded in the field logbook. Section 5.3.2 discusses specific chemical analyses for the test pit samples.

Following the completion of excavation and sampling activities, the test pits will be backfilled with the stockpiled soil that was removed from the excavation. The soil will be added in 2-foot lifts to a level conforming with the surrounding terrain. After each 2-foot lift is replaced, the backhoe bucket will partially compact the soil to reduce potential settling in the future. The soil from the upper 2 feet of the excavation will be placed back at the surface. When the excavation has been backfilled to conform with the surrounding terrain, the backhoe will drive over the test pit to provide additional compaction.

6.3 GROUNDWATER INVESTIGATION

Monitoring wells will be installed in six soil borings in three Tidal Area SWMUs (No. 37, 44, and 50) to support geologic, hydrogeologic, and contaminant characterization efforts. Section 5.0 provides the rationale and locations for the monitoring wells. Groundwater samples will be obtained from existing and new monitoring wells at SWMUs 1, 37, 44, and 50 and collected using HydroPunch or Geoprobe sampling methods at SWMUs 5, 7, and 18.

6.3.1 Monitoring Well Installation

The monitoring wells will begin as soil borings using the equipment and procedures as described in Section 6.2.1. The soil borings will be converted to monitoring wells by reaming the 8-inch soil borings using 12-inch HSAs and then constructing the monitoring well. The design and installation procedures to be followed correspond to those outlined in SOP No. 020.

The monitoring wells will be constructed with 4-inch-diameter, flush-joint threaded Schedule 40 polyvinyl chloride (PVC) and machine-slotted PVC well screens with slot size based on sieve size data. The wells will be screened from 8 feet below the top of the aquifer, leaving 2 feet of screen interval above the water table surface. Figure 35 presents a well construction summary sheet.

6.3.2 Monitoring Well Development

The wells will be developed between 2 and 7 days after the grout has been placed. The wells will be approached cautiously in anticipation of possible explosive or toxic vapor buildup in the casing. The breathing zone will be monitored during well cap removal. The wells will be checked for the presence of light and dense immiscible phases according to SOP No. 014.

The first step in developing a well is to mechanically surge it to remove fine sand and silt. SOP No. 021 describes the monitoring well development procedures to be followed. Measurement of field parameters (temperature, pH, specific conductance, and turbidity) are described in SOP No. 011, 012, 013, and 088, respectively. If the recharge rate of the well is low, the well may be surged again. If the recharge rate remains low after additional development, the well will be bailed to dryness three times. Figure 36 presents an example of the well development data form.

6.3.3 Groundwater Sampling

The monitoring wells will be used to (1) measure groundwater contamination, (2) determine whether free product is present, (3) determine the hydraulic gradient, and (4) measure direction of groundwater flow.

The newly installed wells will be sampled in one sampling period beginning 24-hours after the last well has been developed. The order in which the wells will be sampled will be based on the amount of expected contamination. The wells with no floating product will be sampled first followed by lower and then more highly contaminated wells. All other wells will be sampled immediately after being purged. The groundwater purging and sampling procedures will follow those outlined in SOP No. 010. Measurement of field parameters are described in SOP No. 011, 012, 013, and 088. Figure 37 presents an example of the groundwater sampling data form.

6.3.4 HydroPunch Sampling

The HydroPunch is proposed for three Inland Area SWMUs (5, 7, and 18). A total of 10 soil borings will be sampled. It is anticipated that the soil borings at the SWMUs will be approximately 20 to 30 feet deep.

The locations for each HydroPunch borehole will be selected based on information provided during the site inspections and document review. In general, the locations will be dependent on proximity to the source of COPCs, inferred groundwater flow direction, and drill rig access.

A borehole will first be drilled to groundwater using 8-inch OD hollow-stem augers following the procedures outlined in Section 6.2.1. The hydropunch will then be advanced through the center of the augers to a minimum depth of 3 feet but no greater than 6 feet below the water table. The HydroPunch will then be pulled back a minimum of 3 feet and a water sample will be collected. A detailed description of the operation and advantages of the HydroPunch is provided in SOP 070.

6.4 SEPTIC TANK SAMPLING

Liquid and sludge will be sampled from 15 septic tanks at 14 SWMUs. During the site visit it was noted that septic tanks at nine SWMUs were covered by soil. The septic tank at each of these SWMUs will first be exposed by using a backhoe to remove overlying soil. The septic tank manhole cover will then be removed. Air monitoring using a photoionization detector (PID) will be performed at all times during removal of the manhole cover. At no time will any PRC personnel enter the septic tanks. The depth to water, height of water column, depth to bottom of the septic tank, and thickness of sludge will be measured using a measuring rod. Liquid samples will be collected by lowering a disposable bailer through the open manhole. Sufficient water will be collected to fill all the required bottles. Sludge from the septic tanks will be collected using a hand sampler fitted with brass sleeves and a sand catcher. The general procedures for using a hand sampler are described in SOP No. 005. If a sample cannot be retained in the hand sampler, alternate methods that are described in SOP No. 006 may be used to collect sludge samples.

6.5 SURFACE WATER SAMPLING

Surface water samples will be collected at four SWMUs. SOP No. 09 describes methods that can be used for surface water sampling. The general procedure to collect surface water samples will be to submerge the sample container into the surface water. If insuffient surface water is available, a transfer device will be used.

6.6 SITE SURVEYING

The elevation (vertical control) for the natural ground surface for each soil boring and monitoring well will be surveyed to within plus or minus 0.1 foot using the National Geodetic Vertical Datum of 1929. The top of the steel protective casing on abovegrade well head completions will be surveyed, as will the north side of the uncapped well casing to within plus or minus 0.01 foot. The surveyed point on the north side of the monitoring well casing will be marked with a small notch cut into the casing. The notch will be used as a reference point when water level elevations are measured.

Locations of the test pits at SWMU 2 and all of the field samples will be surveyed horizontally relative to the WPNSTA Concord system to an accuracy of plus or minus 1 foot. The ground surface elevation will be measured to within plus or minus 0.1 foot using the National Geodetic Vertical Datum of 1929.

6.7 DECONTAMINATION PROCEDURES

The purpose of decontamination and cleaning procedures during drilling, well installation, and soil and water sampling tasks is to prevent foreign contamination of the samples and cross contamination between wells and between sampling sites. All drilling equipment and equipment for sampling groundwater, sludge, sediment, and soil will be decontaminated by steam cleaning or alternatively by washing with a nonphosphate detergent such as Liquinox or its equivalent. A tap water rinse and a double-deionized (DI) water rinse will follow the detergent wash. All sampling equipment will be decontaminated prior to sampling and between each sample location following procedures outlined in SOP No. 002. All equipment will be handled in such a way to prevent cross contamination between sample locations.

6.8 DISPOSAL OF INVESTIGATION-DERIVED WASTES

The site investigation activities will generate a variety of contaminated materials. The materials will be handled as described in the waste management plan to be prepared under CTO No. 0283 and is summarized as follows:

Personnel Protective Equipment (PPE)

Contaminated PPE will be removed within the work area, cleaned, placed in plastic bags, and stored in labeled 55-gallon drums. The contents of the drums will also be transferred to a bin for disposal as solid waste.

Decontamination Water

Decontamination water will be contained in 55-gallon drums and then transferred to a holding tank. The water will be sampled after completion of the project. If the water is determined to be nonhazardous, it will be released into the WPNSTA Concord waste treatment facility. If the results show the water to be hazardous, the water will be disposed of off site. The required hazardous waste manifest will be signed by an authorized party from WPNSTA Concord. The water will be transported to a state approved treatment, storage, and disposal (TSD) facility by a registered hauler.

Drill Cuttings, and Well Development and Sampling Water

Drill cuttings and well purge water will be stored on-site in drums labelled as "**ANALYTICAL RESULTS ARE PENDING ON THE CONTENTS OF THIS CONTAINER.**" A completed label will include the following information: waste generation date, waste type, source SWMU number, and soil boring or monitoring well number. The drums will be handled as if their contents tested as hazardous and, therefore, the 90-day storage limit will apply. To facilitate tracking of the 90-day limit, the date when storage began will also be indicated on the drums. If laboratory results are not available during the 90-day storage limit, a request for a 30-day extension will be made to the DTSC Facility Permit Branch. Following analysis of soil samples, cuttings may be redistributed for on-site remediation or disposal. If remediation is not possible, the cuttings may be hauled off site by a licensed waste hauler to an appropriate TSD facility.

6.9 FIELD DOCUMENTATION

Sampling activities during the field effort require several forms of documentation. While chain-of-custody (COC) documentation is discussed in the QAPjP, additional project documentation is mandatory. Such documents are prepared to maintain sample identification and chain of custody as well as to provide records of significant events or observations. The procedures to be followed for field documentation are described in SOP No. 024.

All observations made during the drilling process will be recorded in the boring log. Boring logs (Figure 34) are graphical representations of the subsurface providing a summary of information recorded during drilling activities.

A monitoring well construction diagram provides a detailed summary of a monitoring well design (Figure 35). The diagram will be developed from information recorded in the field logbook at the time of installation.

The well development log and groundwater sampling log (Figure 36 and 37) will be used during any well development and sampling. Specific well information will be recorded at the top of the log, including casing and borehole volumes.

The daily field progress report will be submitted to the project manager each day during field activities. An example of the report is shown on Figure 38.

Notification of field variance provides a written record documenting proposed changes to project plans including the FSP, the HSP, and the QAPjP. A typical notification of field variance is shown in Figure 39. The rationale for the proposed variances and anticipated impacts of the deviation will be included in the notification. The notification of field variance will be signed by appropriate project personnel including the field team leader, the health and safety officer, and the project manager. Approval of the change by the Navy Engineer-in-Charge (EIC) may be necessary before implementing any variances to the field program.

6.10 SAMPLE IDENTIFICATION

The goal of sample identification is to provide a method for tracking each sample through collection, analysis, data validation, and data reduction. Two sample identification systems, a field identification system and a laboratory identification system, have been established for the SI at WPNSTA Concord. These systems have been developed to efficiently manage sample tracking and referencing as well as to provide a means of submitting blind samples to the laboratory. Each sample that field personnel collect will receive a field number based on an alphanumeric code, that gives the sample a designation that is unique to that sample while being simple enough to minimize transcription errors. Field personnel will use this number, which facilitates the reporting of information about a specific sample and site. The field number will not be submitted to the laboratory. To create blind samples, each sample submitted to the laboratory will have a unique identifier based on a consecutive numeric code. The following sections describe in detail the two sample identification systems.

6.10.1 Field Identification System

The field identification system to be used will identify each site; soil boring; groundwater monitoring well; and surface soil, surface water, or test pit sample taken during the investigation. Each field number will consist of four parts as described below:

Field Numbering System

SI Site Number	Sample Location	Sample Type	Field Identifier
01	HA	S	00

The "**SI Site Number**" is two numerals corresponding to the SWMU number of the site. The SI site numbers and their corresponding site names are as follows:

SI Site Number	Site Name
Inland Area Sites by SWMU Number	
01	Building IA-6 (Boiler House)
02	Building IA-7 (Burn Pit)
05	Building IA-7 (Locomotive Repair)
07	Building IA-12 (Public Works Shop)
12	Building IA-16 (Forklift Maintenance)
13	Building IA-20 (Missile Component Maintenance)
14	Building IA-27 (Carpenter Shop)
15	Building IA-41 (Paint Storage Shop)
16	Building IA-46 (Public Works Storage)
17	Building IA-50 (Rail/Truck Transfer Depot)
18	Building IA-51 (Vehicle Maintenance)
20	Building IA-55 (Ordnance Operations)
22	Building 81 (Ordnance Maintenance)
23	Building 87 (Storage Building)
24	Building 93 (Guided Missile Division)
25	Building 97 (Ordnance Assembly Building)
51	Building IA-56 (Forklift Training School)
52	Building 7SH5 (Missile Repair)
53	Building 7SH14 (Storehouse)
54	Building 79 (Guardhouse)
Tidal Area Sites by SWMU Number	
37	Building A-29 (Dunnage Salvage Yard)
40	Building 174 (Electric Substation)
44	Building 350 (Marine Ordnance Building)
50	Building E-108 (Boiler House)

The "**Sample Location**" is a two-letter designation code used by the field personnel to identify the type of location at which the sample was taken followed by two numerals to identify the specific location (such as a monitoring well number) if applicable. The codes are as follows:

Code	Location
MW	Monitoring Well
SB	Soil Boring
HA	Hand-Augered Boring
ST	Septic Tank Sludge

Code	Location
SS	Surface Soil
SL	Septic Tank Liquid
HP	HydroPunch Sample
GP	Geoprobe Sample
TP	Test Pit
SW	Surface Water

The "**Sample Type**" is a code used by the field personnel to identify the type of sample collected at a given location. The codes are as follows:

Code	Sample Type
S	Soil
W	Water
L	Liquid
SL	Sludge
PD	Product
TB	Trip Blank
ER	Equipment Rinsate
FB	Field Blank
MS/MSD	Matrix Spike/Matrix Spike Duplicate
DUP	Duplicate

The final identifier for soil samples is two digits representing the depth from which the sample was collected. For groundwater samples, the final identifier will be a four-digit number indicating the month and year that the groundwater sample was collected.

A soil sample with the identification of 02-HA01-S-00 would represent a soil sample collected at a depth of 0 feet bgs from hand auger boring No. 01 at SWMU No. 02 (building IA-7). Assuming that a groundwater sampling program is performed in February 1995, a groundwater sample collected from monitoring well MW-3, located at SWMU No. 01, would be identified as 01-MW03-W-0295.

Quality Assurance/Quality Control (QA/QC) samples will be identified in the field as described above, but they will be sent to the laboratory without identifying the sample type described in this subsection. All sampling locations will be recorded on appropriate forms during field activities to identify the sampling location corresponding to the sample sent to the laboratory.

6.10.2 Laboratory Identification System

The laboratory identification system to be used during the SI at WPNSTA Concord will assign a blind identification number to each sample submitted to the laboratory during the investigation. Each sample number will consist of three parts as described below:

Laboratory Numbering System

	CTO Number	SI Site SWMU Number	Sample Number
Example:	283	02	014

The "CTO Number" is three digits assigned by the Navy as a reference to a specific task order under the CLEAN contract. The reference CTO number to be used for the SI at WPNSTA Concord is "283."

The "SWMU Number" is the two digits used to identify each SWMU. The numbers are listed in Section 6.10.1.

The "Sample Number" is an arbitrary number representing a sequential identifier for the samples. This number will be cross-referenced with the field identification number by the field personnel and will allow all samples to be submitted blind to the laboratory. For example, a sample with the identification of 283-02-014 would represent the fourteenth sample collected at SWMU 02 (building IA-07) during the performance of CTO No. 283. Dedicated logbooks will be used during the field program at WPNSTA Concord to maintain the sequential numbering system. The use of dedicated logbooks and chains of custody will ensure that no duplication of the assigned sequential sample numbers will occur. Quality Control (QC) samples will be given a sequential number similar to all other field samples, thus ensuring all samples will be submitted blind to the laboratory.

7.0 SCHEDULE

A proposed schedule for completion of the SI activities at WPNSTA Concord is presented in Figure 40. The schedule has been detailed to reflect each major class of activity to be performed. The schedule presents time frames to complete specific activities and specific dates for completion of each activity. The major types of activities to be performed during the SI include:

- Preparation of the FSP, HSP, and QAPjP.
- Drilling soil borings and collecting soil samples.
- Excavation of test pits.
- Installation of monitoring wells and collection of groundwater samples.
- Collection of liquid and sludge samples from septic tanks.
- Collection of surface water samples.
- Preparation of the SI report summarizing the activities and findings.

The project plans are scheduled for completion by December 1994 following regulatory agency comments. Field activities starting with mobilization through final demobilization are scheduled to occur from January 1994 through May 1995. The draft SI report is scheduled for submittal in September 1995.

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FIGURES

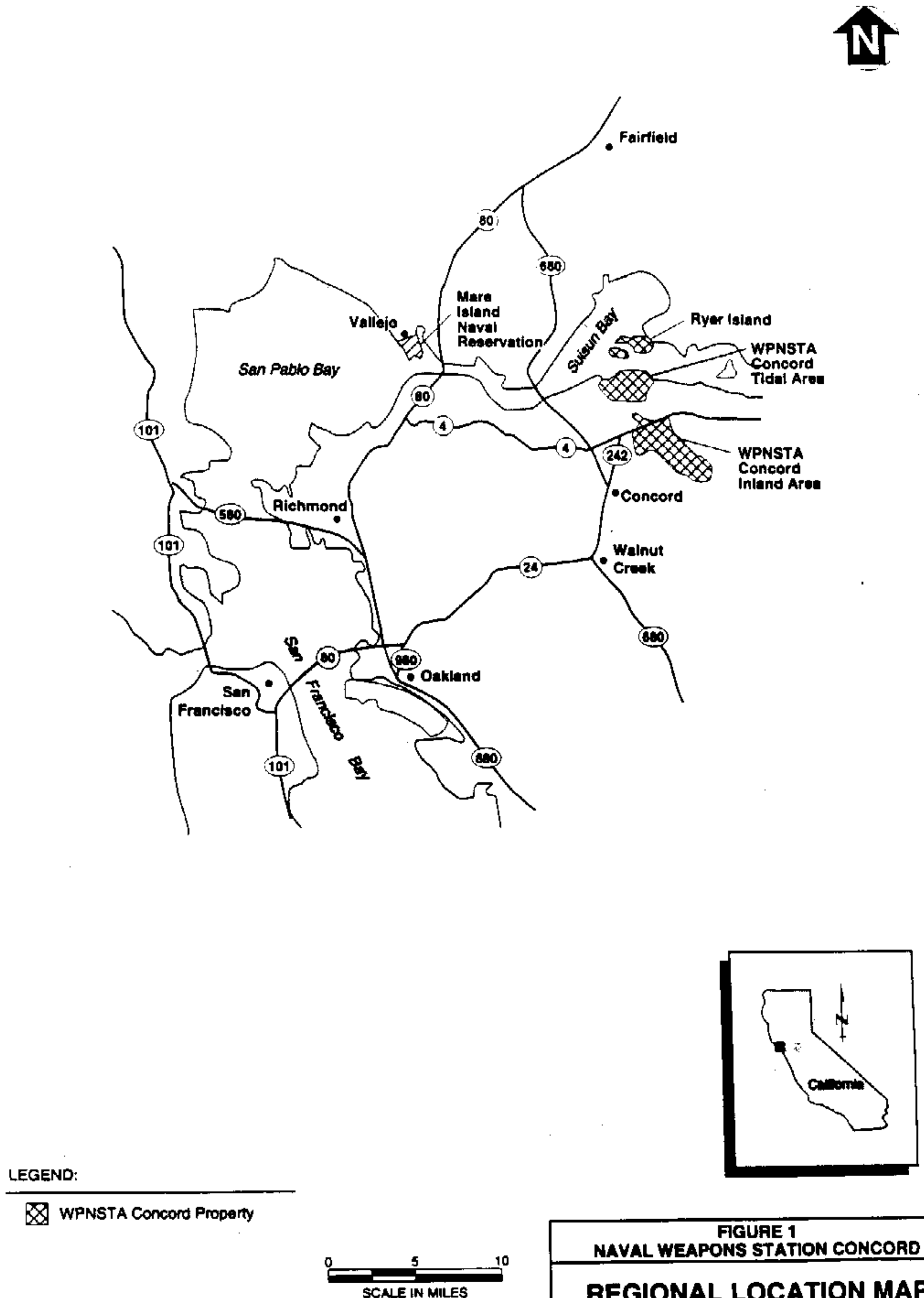
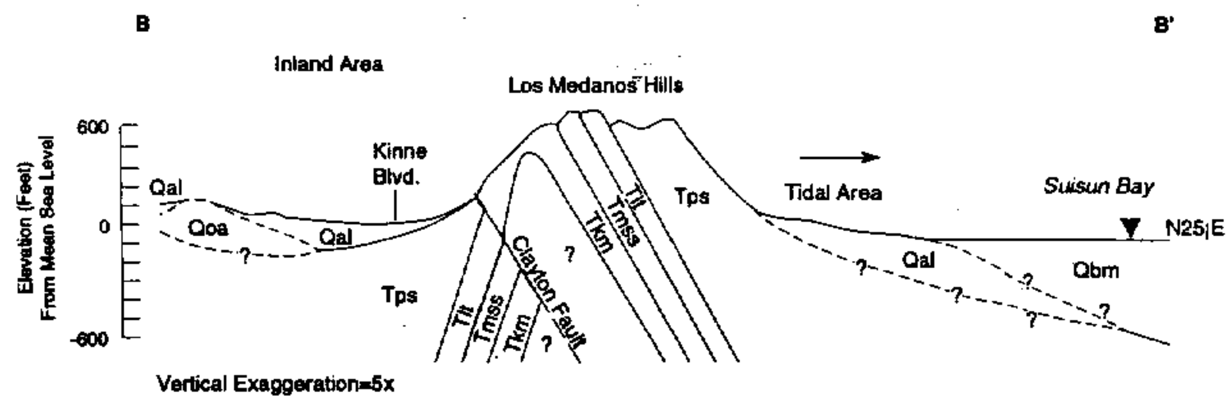


FIGURE 1
NAVAL WEAPONS STATION CONCORD

REGIONAL LOCATION MAP

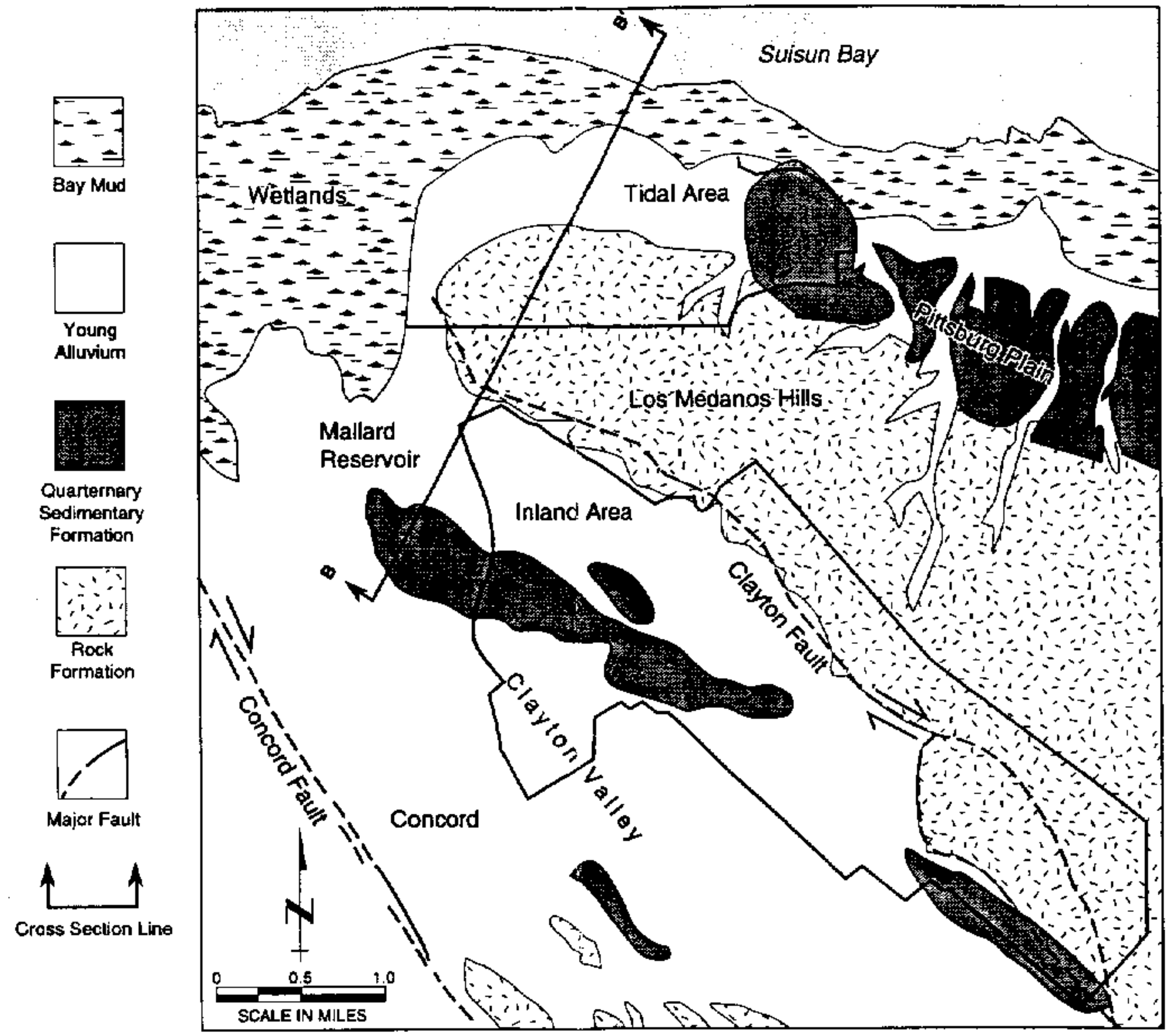
Figures 2 - 6

These detailed station maps have been deleted from the Internet-accessible version of this document as per Department of the Navy Internet security regulations.



Qbm	Bay Mud
Qal	Young Alluvium
Qoa	Old Alluvium
Tps	Pliocene Nonmarine Sedimentary Rocks
Tlt	Pliocene Pumiceous Tuff Breccias (Lawlor Tuff)
Tmss	Miocene Marine Sandstones
Tkm	Eocene Sandstone-Markley Member of Kreyenhagen Formation

Source: Adapted from DIBBLEE, 1981



Source: LUTTON, et. al., 1987
DIBBLEE, 1980a,b,c, 1981

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FIGURE 7
NAVAL WEAPONS STATION CONCORD

REGIONAL GEOLOGY

Figure 8

This detailed station map has been deleted from the Internet-accessible version of this document as per Department of the Navy Internet security regulations.

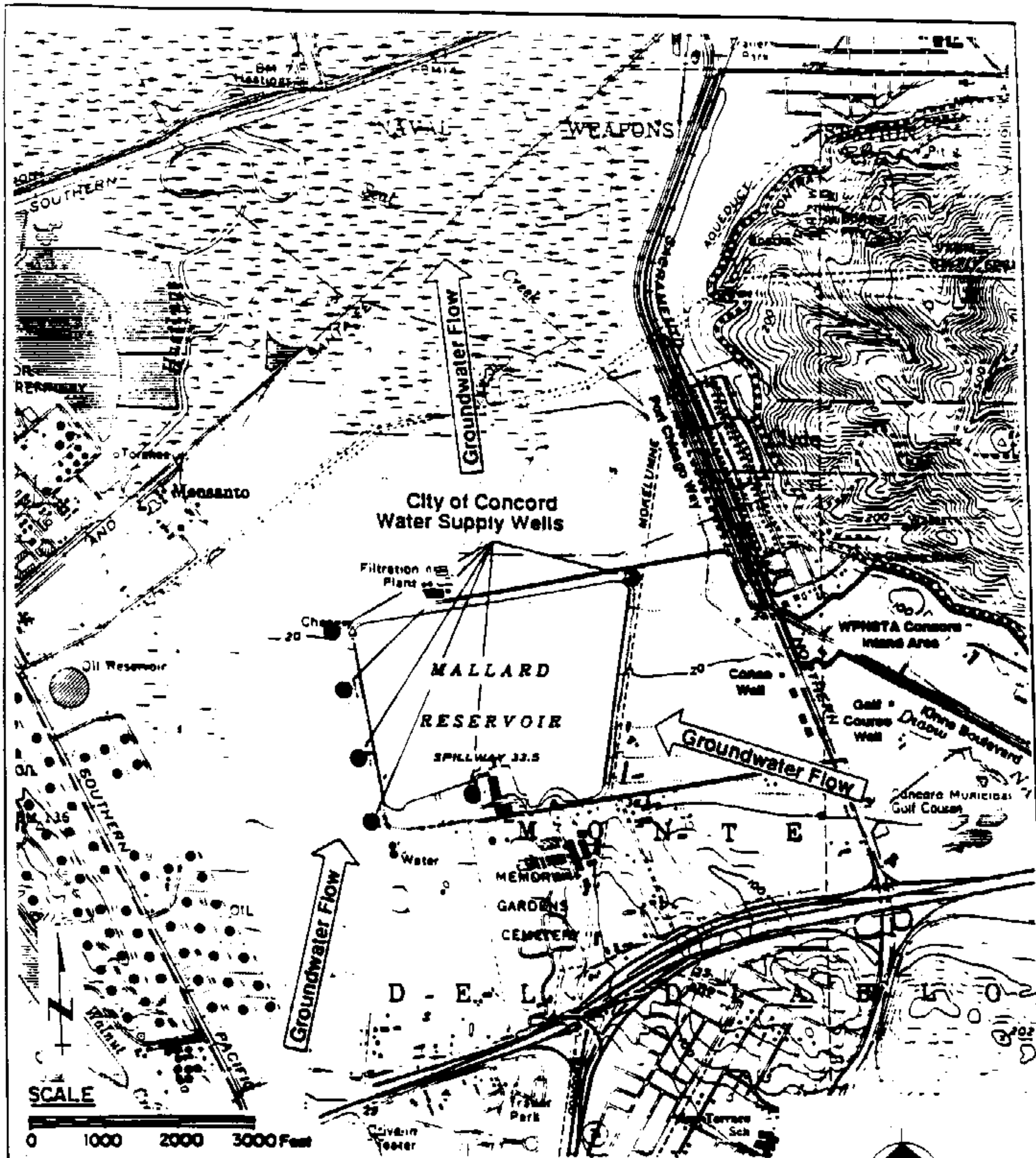


FIGURE 9
NAVAL WEAPONS STATION CONCORD

LOCATION OF WATER WELLS
IN THE VICINITY OF WPNSTA CONCORD

Source Drawing: Figure 3-5, IT Volume II, Draft Sampling Plan, June 1989

Figures 10 - 33

These detailed station maps have been deleted from the Internet-accessible version of this document as per Department of the Navy Internet security regulations.

FIELD BORELOG

PRC ENVIRONMENTAL MANAGEMENT, INC

SHEET ____ OF ____

LOCATION OF BOREHOLE	
	JOB NO.:
	BOREHOLE DESIGNATION:
	CLIENT:
	SURFACE ELEVATION:
	SITE:
	DEPTH TO WATER:
	SUBSITE:
	LOGGED BY:
	DRILLING CO.:
	DRILLING DATE(S):
	DRILLING PERSONNEL/METHOD:

SAMPLE TYPE	SAMPLE DEPTH	[illegible]	[illegible]	TIME	[illegible]	[illegible]	WELL	DEPTH	USCS SOIL TYPE / GRAPHIC LOG	SOIL DESCRIPTION
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

FIGURE 34
NAVAL WEAPONS STATION CONCORD

FIELD BORING LOG

PRC
ENVIRONMENTAL MANAGEMENT, INC.

MONITORING WELL INSTALLATION RECORD
NONTELESCOPING WELL

WELL LOCATION INFORMATION

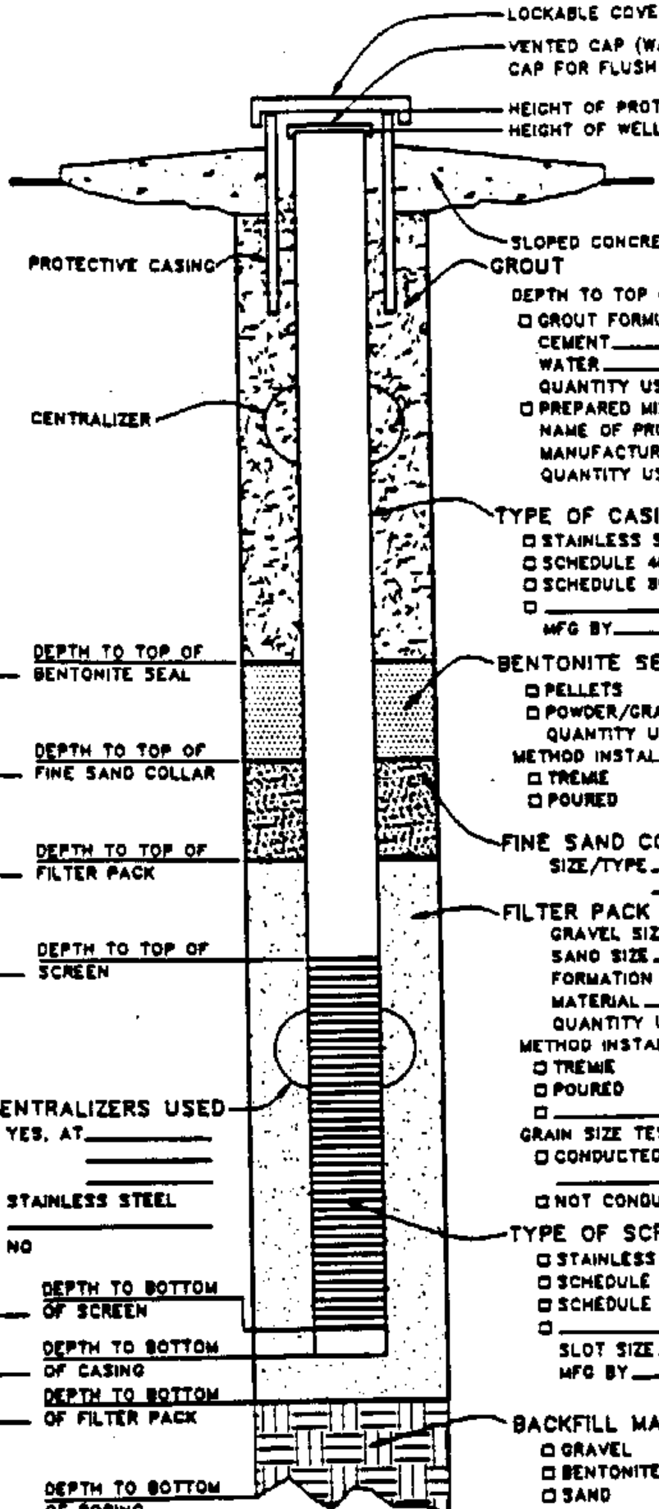
WELL NO. ______
BOREHOLE NO. ______
SITE ______
SUBSITE ______
DATE ______
RECORDED BY ______
WELL PERMIT NO. ______

SURFACE COMPLETION INFORMATION

TYPE OF INSTALLATION
☐ ABOVE GROUND INSTALLATION
☐ PROTECTIVE POSTS INSTALLED
☐ FLUSH MOUNT INSTALLATION
TYPE ______
☐ TRAFFIC RATED
☐ WATERTIGHT SEAL
☐ WATERTIGHT WELL CAP
TYPE OF PROTECTIVE CASING
☐ STEEL SIZE ______
☐ ______
SURFACE SEAL
☐ NONSHRINKING CEMENT
☐ CONCRETE
☐ ______
☐ CHECKED FOR SETTLEMENT
☐ INTERNAL MORTAR ADDED
GROUND SURFACE ELEVATION
☐ SURVEYED
DATE ______
MEASURING POINT
☐ TOP OF WELL CASING
☐ TOP OF PROTECTIVE CASING
☐ GROUND SURFACE
☐ ______

DRILLING INFORMATION

DRILLING COMPANY/PERSONNEL
______
______
______
DRILL RIG ______
DRILLING METHOD
☐ HOLLOWSTEM AUGER
☐ AIR ROTARY
☐ MUD/WATER ROTARY
☐ ______
DRILLING BEGAN
DATE ______ TIME ______
WELL COMPLETION BEGAN
DATE ______ TIME ______
WELL COMPLETION FINISHED
DATE ______ TIME ______
DRILLING FLUID TYPE
☐ BENTONITE ☐ WATER
☐ POLYMER ☐ ______
DRILLING FLUID LOSS
☐ YES ______ GALLONS
☐ NO
WATER ADDED DURING COMPLETION
☐ YES ______ GALLONS
☐ NO
TOTAL FLUID LOSS TO FORMATION
______ GALLONS



CENTRALIZERS USED
☐ YES, AT ______
______
______
☐ STAINLESS STEEL
☐ ______
☐ NO

TOTAL LENGTH OF CASING AND SCREEN ______

DEPTH TO WATER FOLLOWING INSTALLATION (TOC) ______

GROUT
DEPTH TO TOP OF GROUT
☐ GROUT FORMULA (PROPORTION OF EACH)
CEMENT ______ BENTONITE ______
WATER ______ OTHER ______
QUANTITY USED ______
☐ PREPARED MIX
NAME OF PRODUCT ______
MANUFACTURED BY ______
QUANTITY USED ______

TYPE OF CASING
☐ STAINLESS STEEL CASING DIAMETER
☐ SCHEDULE 40 PVC INSIDE ______
☐ SCHEDULE 80 PVC OUTSIDE ______
☐ ______
MFG BY ______

BENTONITE SEAL
☐ PELLETS ☐ SLURRY
☐ POWDER/GRANULAR ☐ ______
QUANTITY USED ______
METHOD INSTALLED
☐ TREMIE ☐ ______
☐ POURED ☐ NOT USED

FINE SAND COLLAR (OPTIONAL)
SIZE/TYPE ______
______

FILTER PACK
GRAVEL SIZE ______ : ______ TO ______ FT
SAND SIZE ______ : ______ TO ______ FT
FORMATION COLLAPSE: ______ TO ______ FT
MATERIAL ______
QUANTITY USED ______
METHOD INSTALLED
☐ TREMIE
☐ POURED
☐ ______
GRAIN SIZE TESTS FOR FILTER PACK
☐ CONDUCTED; FOR REPORT, REFER TO
______
☐ NOT CONDUCTED

TYPE OF SCREEN
☐ STAINLESS STEEL SCREEN DIAMETER
☐ SCHEDULE 40 PVC INSIDE ______
☐ SCHEDULE 80 PVC OUTSIDE ______
☐ ______
SLOT SIZE ______
MFG BY ______

BACKFILL MATERIAL
☐ GRAVEL ☐ FORMATION COLLAPSE:
☐ BENTONITE MATERIAL ______
☐ SAND ______
☐ ______

DIAMETER OF BOREHOLE ______

NOTES:
1. SCALE: NONE
2. RECORD FRACTIONAL FEET IN DECIMAL, NOT IN INCHES
3. RECORD CONSTRUCTION DEPTHS BELOW GROUND LEVEL

DATE: 11/21/91 JAA FILE NAME: D:\STANO\INSTAL09.DWG

FIGURE 35
NAVAL WEAPONS STATION CONCORD

WELL CONSTRUCTION DETAI

WELL DEVELOPMENT DATA SHEET

Boring No. ____________ Well No. ____________

Project ______________________________
Project No. ______________________________
Date(s) of Installation ______________________
Date(s) of Development ______________________
Personnel/Company ______________________

Type of Rig Used ______________________

Casing Diameter/Type ______________________
Borehole Diameter ______________________
Screened Interval(s) ______________________
Total Length of Well Casing ______________
Measured Total Depth (TOC) Initial ____________
Final ____________
Initial Depth to Water
(TOC) ____________ Date ________ Time ________
Stabilized Depth to Water
(TOC) ____________ Date ________ Time ________

DEVELOPMENT

TECHNIQUE(S)	EQUIPMENT TYPE/CAPACITY
___ Jetting (Airlift)	______________
___ Surge Block	______________
___ Bailing	______________
___ Pumping	______________
___ Other	______________

FLUIDS ADDED

Lost Drilling Fluid: ____________ Gallons
Lost Purge Water: ____________ Gallons
Water During Installation: ____________ Gallons
Total Fluids Added: ____________ Gallons
Source of Added Water: ____________________
Ground Water Quality Parameters of
Added Water Measured: Y N
Sample Collected of Added Water: Y N
Sample Designation of Added Water: ______________

PURGE VOLUME CALCULATION

Casing Volume: ____________ Feet of Water
X ____________ Gallons/Foot
= ____________ Gallons per Single Casing Volume
Sand Pack Volume: ________ Ft. of Saturated Sand Pack
X ____________ Gallons/Ft. (Borehole Dia.)
= ____________ Gallons (in Borehole)
- ____________ Gallons of Casing Volume
= ____________ x 0.3 (Assuming porosity = 30%)
= ____________ Gallons within Sand Pack
Single Purge Volume: ____________ Gallons (Casing Vol. + Sand Pack Vol. + Fluids Added)
Minimum Purge Volume: ________ Gallons
Actual Purge Volume: ________ Gallons
Volume Measured by: ______________________
Rate of Development ______ Gallons/Minute (Hour,Day)
Pumping Rate/Depth ________ @ ____ Ft. (Below Grd.)
Immiscible Phases Present: Y N Thickness ____________

INSTRUMENT CALIBRATION

pH Meter: ______________________
pH 4.0 = ________ @ ____ °C
pH 7.0 = ________ @ ____ °C
pH 10.0 = ________ @ ____ °C
Dissolved Oxygen Meter: ______________________

Spec. Conductance Meter: ______________________
Standard ____________ µmhos/cm@ 25°C
Reading ____________ µmhos/cm @ ______ °C
Turbidity Meter: ______________________
Other: ______________________

Total Volume Discharged	Rate of Discharge	Time	Temp	pH	Specific* Conductance	Turbidity or D.O.	Clarity, Odor PID Readings, Other:

Development Completed at ____________ Gallons Discharged. Date: ____________ Time: ____________
Criteria: ______________________________ Personnel: ______________________

* Specific Conductance readings temperature compensated to 25°C, if not, report temperatures at which reading obtained.

FIGURE 36
NAVAL WEAPONS STATION CONCORD

WELL DEVELOPMENT LOG

PRC GROUND WATER SAMPLING DATA SHEET

Page ______ of ______

Well Number ______ Location ______ Date ______

Project ______ Project No. ______ Samplers ______

Station Elevation ______ Well Stick Up ______ Supervisor ______

Casing Diameter ______ Well Depth: ______ Measured ______ Reported ______ Water Level (From TOC) ______

Gallons Water/Ft. ______ Casing Volume ______ Screened Interval ______

Immiscible Phases Present ______ Type ______ Thickness ______ Measured with ______

PID Readings (Background) ______ TOC ______

FIELD CHEMISTRY CALIBRATION

Date/Time: ______ Conductivity: Standard ______ umhos/cm at 25 °C Reading ______ umhos/cm at ______ °C

pH: pH 4.00 = ______ at ______ °C pH 7.00 = ______ at ______ °C pH 10.00 = ______ at ______ °C Slope ______

DO: D.O. Meter: ______ mg/l at ______ °C PID: Calibration Gas ______ ppm ______ Span ______ Reading ______

Time	Pumping Rate gpm	D.O. mg/l	pH	Temp. °C	E.C. umhos/cm at °C	Cum. Vol. of H_2O Removed		PID Reading		Comment
						gallons	Casing Vols	Loc.	Value	

Condition of Well ______

Remarks ______

FIELD EQUIPMENT

pH meter ______ Serial No. ______

E.C. meter ______ Serial No. ______

Pump ______ Serial No. ______

Bailer ______ Size ______

Water Level Meter ______ Serial No. ______

D.O. Meter ______ Serial No. ______

Filter Apparatus ______ Filters ______

Temperature Measure ______

Interface Probe ______ Serial No. ______

PID ______ Serial No. ______

SAMPLING DESCRIPTION:

Fractions ______

No. of Bottles ______

Sample Depth ______

Field Notebook No. ______

Sample Method ______

Discharge H_2O Containerized ___ Yes ___ No

FIGURE 37
NAVAL WEAPONS STATION CONCORD

WELL SAMPLING LOG

PRC Environmental Management, Inc.

Sheet ______ of ______

Project: ______ PRC Charge No. ______

Subject: ______ Date: ______

Supplies Expended: ______ Arrive: ______ Depart: ______

PRC Staff: ______

Subcontractors: ______

PRC Field Equipment Used: ______

Site Location: ______ Site Description: ______

Site Safety Officer: ______ Tailgate Safety Meeting ______

Weather: ______

Field Activities: Reconnaissance ☐ Surveying ☐ Drilling ☐

Sampling ☐ Type of Media ______ Other ☐ ______

Sample Type ______ Boring/Monitor Well Location ______

Refusal/T.D. ______ Well Screen Interval ______ Sand Pack: ______

Grout Volume: ______

Screen Size: ______ Development: ______

Sampling Procedures: ______

Decon Procedures ______ Purged Volume: ______

Activity Description: ______

Problems And/Or Unusual Occurrences: ______

Visitors On-Site: ______

Proposed Work Schedule: ______

Changes Current Work Schedule or Work Plan: ______

Sample Handling: Lab Pick-ups: ______

Special Lab Procedures and/or handling: ______

Attachments: Initials ______

044-0837AA18AAI KK_FORM DRW 10/31/91

FIGURE 38
NAVAL WEAPONS STATION CONCORD

DAILY FIELD PROGRESS REPORT

PRC Environmental Management, Inc.

NOTIFICATION OF FIELD VARIANCE

PRELIMINARY ASSESSMENT/SITE INVESTIGATION

CONTRACT N0. N62444-88-D-5086. PRC CTO 0283

PAGE ____ OF ____

Report No.: ____________

Subject: ______________________________________

Spec. Section: ____________

DWG. Ref.: ____________

ITEM OF NON-COMPLIANCE AND SUGGESTED CORRECTIVE ACTION:

____

PRC Representative Name (print): ____________

Signature: ____________ Date: ____________

Attachment: ____________

Copies to: ____________

FIGURE 39
NAVAL WEAPONS STATION CONCORD

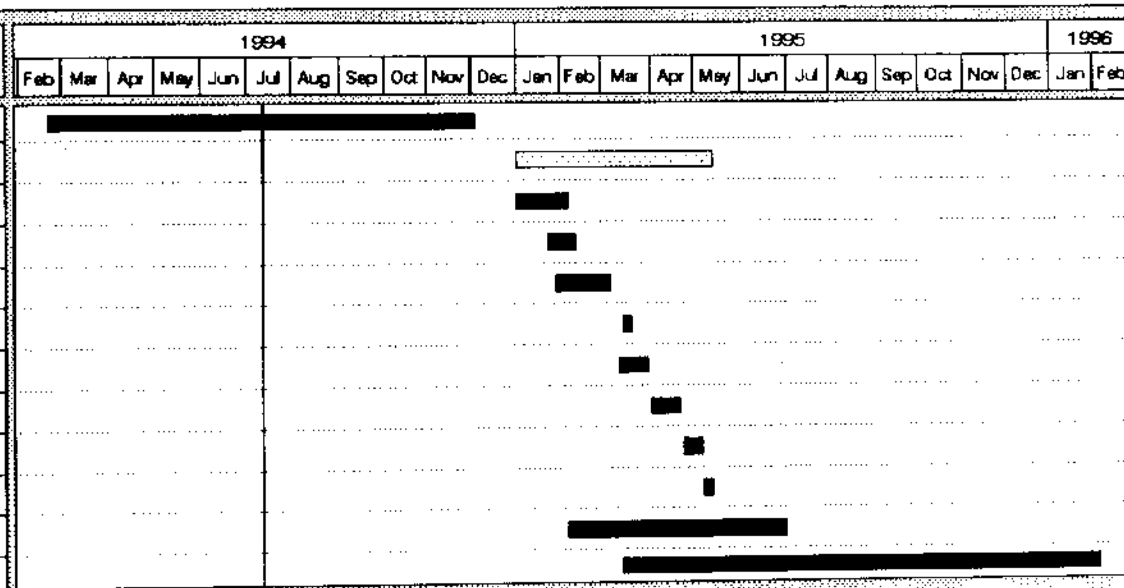
NOTIFICATION OF FIELD VARIANCE

FIGURE 40

PROPOSED SCHEDULE - SI

NAVAL WEAPONS STATION CONCORD

Task Name	Start Date	End Date
SI Project Plans	21-Feb-94	5-Dec-94
Field Work	3-Jan-95	12-May-95
Mobilization	3-Jan-95	7-Feb-95
Hand Auger	24-Jan-95	10-Feb-95
Soil Borings	30-Jan-95	7-Mar-95
Test Pits	15-Mar-95	21-Mar-95
Well Development	13-Mar-95	31-Mar-95
Well Sampling	3-Apr-95	21-Apr-95
Septic Tank Sampling	24-Apr-95	5-May-95
Dembolization	8-May-95	12-May-95
Lab Analysis	6-Feb-95	3-Jul-95
SI Report	15-Mar-95	7-Feb-96



TABLES

TABLE 1
SUMMARY OF SOLID WASTE MANAGEMENT UNITS

SWMU No.	Site	Past Releases	Nature of Activity	Comments
INLAND AREA SWMUs				
1	Building IA-6 (Boiler House)	Yes	Three boilers to supply heat to buildings.	UST removed; 1,900 gallons of diesel fuel released. Four monitoring wells installed. Grease and sand trap located next to building.
2	Building IA-7 (Burn Pit)	Yes	Practice burns using fuel oil and napalm; practiced twice a year.	Between 1961 and 1973, residues scraped from ground and disposed of in Seal Creek bed south of site.
5	Building IA-12 (Locomotive Repair)	Yes	Sump to collect waste from steam cleaning. UST for waste oil. Battery storage and maintenance.	Battery acid known to have drained into shower drain. Stains located around paved areas. Four soil borings drilled adjacent to steam cleaning area.
7	Building IA-16 (Public Works Shop)	Yes	Four 10,000-gallon USTs. Paint shop and locker.	1 to 2 gallon fuel spills occurred. Leak test conducted annually.
8	Building IA-20 (Chemical Laboratory)	Yes	Testing hydraulic fluids.	Spills to the floor drain and sink occurred. Wastes generated include denatured alcohol, mineral spirits, oils, acids, bases, and Freon 113. (Being investigated under IRP Site 27 - CTO 0250).
12	Building IA-24 (Forklift Maintenance Building)	Yes	Maintenance of forklift equipment; used oil, paint spray cans, and batteries.	Small spills of oil are known to have occurred. Possibility that hazardous waste may have leached into soil form septic tank system. (Being investigated under IRP Site 17, CTO 0250).
13	Building IA-25 (Missile Component Maintenance)	Possible	Ordnance reconditioning. Paint spray cans and solvents.	Possibility that hazardous waste may have leached into soil from septic tank system.

TABLE 1
SUMMARY OF SOLID WASTE MANAGEMENT UNITS
(Continued)

SWMU No.	Site	Past Releases	Nature of Activity	Comments
14	Building IA-27 (Carpenter Shop)	Possible	Carpentry work; paints and thinners used.	Possibility that hazardous waste may have leached into soil from septic tank system.
15	Building IA-41 (Paint Storage Shop)	Possible	Paint storage shop.	Possibility that hazardous waste may have leached into soil.
16	Building IA-46 (Public Works Storage)	Possible	Accumulation of asbestos stored in drums. Fluorescent light tube crushing operation.	Suspected releases of asbestos and mercury.
17	Building IA-50 (Rail/Truck Transfer Depot)	Possible	Transfer ordnance. At present not in use.	Possibility that hazardous waste may have leached into soil from septic tank system.
18	Building IA-51 (Vehicle Maintenance)	Yes	Equipment cleaning and vehicle maintenance: steam cleaning oily waste drained into sump.	Chromates detected in Seal Creek in 1978: traced to zinc chromate added to engine antifreeze and dumped onto ground and into the storm drain.
20	Building IA-55 (Ordnance Operations)	Possible	Tools and supplies issued.	Possibility that hazardous waste may have leached into soil from septic tank system.
22	Building 81 (Ordnance Maintenance)	Possible	Fuses and hydraulic fluids tested.	Possibility that hazardous waste may have leached into soil from septic tank system.
23	Building 87 (Storage Building)	Possible	Storage building; wastes included spray cans, oil, and solvents.	Possibility that hazardous waste may have leached into soil from septic tank system.
24	Building 93 (Guided Missile Division)	Possible	Wastes generated include solvents and adhesives.	Possibility that hazardous waste may have leached into soil from septic tank system.

TABLE 1
SUMMARY OF SOLID WASTE MANAGEMENT UNITS
(Continued)

SWMU No.	Site	Past Releases	Nature of Activity	Comments
25	Building 97 (Ordnance Assembly Building)	Possible	Three USTs at site; stored JP-5 fuel.	Three USTs removed: results indicate site to be free of JP-5. Possibility that hazardous waste may have leached into soil from septic tank system.
26	Building 178 (Navy Exchange Service Station)	Yes	Three USTs and a waste oil tank.	All USTs removed; site now undergoing remediation and investigation under CTO 238.
30	UNOCAL Corp.	Yes	Pipeline across base.	Approximately 100 gallons released. Contaminated soil identified. Monitoring wells installed. Quarterly monitoring conducted by UNOCAL. Closure report submitted by UNOCAL to RWQCB and CCCEHD in March 1991.
33	Site 6LC98 (Magazine Boiler UST)	Yes	UST for diesel fuel storage.	UST removed in January 1991; soil contamination still present. Investigation conducted by WPNSTA Concord.
			TIDAL AREA SWMUs	
37	Building A-29 (Dunnage Salvage Yard)	Possible	Waste treated wood temporary storage. Chemically treated with creosote, pentachlorophenol, or copper arsenate.	Possibility that hazardous waste may have leached into soil.
40	Building 174 (Electric Substation)	Possible	Form[illegible] of PCB transfo[illegible] and electrical switches.	PCB transformer removed and replaced with non PCB transformer. Concrete floor of building 174 and surrounding soil at site may have PCBs due to possible transformer leaks.

c:\reports, ljt, (1:35 pm)
CONCORD.TBL, 11/30/94

TABLE 1
SUMMARY OF SOLID WASTE MANAGEMENT UNITS
(Continued)

SWMU No.	Site	Past Releases	Nature of Activity	Comments
44	Building 350 (Marine Ordnance Building)	Possible	Ordnance maintained and inspected. Waste generated include paint cans and solvents. Two 2,000 gallon USTs used to store diesel.	Pressure guage leaked about 20 gallons of diesel onto floor. Possibility that hazardous waste may have leached into soil from septic tank system. USTs still active.
46	Site E-111 (Heating Plant)	Yes	UST used to store diesel fuel.	Leaks known to have occurred from UST. UST was removed and hole backfilled for safety. Now being investigated under CTO No. 0240.
NEW SWMUs				
50	Building E-108 (Tidal Area)	Yes	Former boiler house	During parking lot repair, petroleum hydrocarbons were detected in soil and groundwater.
51	Building IA-56 (Inland Area)	Possible	Forklift Training	Possibility that hazardous waste may have leached into soil from septic tank system.
52	Building 7SH5 (Inland Area)	Possible	Inert missile component repair and maintenance.	Possibility that hazardous waste may have leached into soil from septic tank system.
53	Building 7SH14 (Inland Area)	Possible	Storehouse Building	Possibility that hazardous waste may have leached into soil from septic tank system.
54	Building 79 (Inland Area)	Possible	Guardhouse	Possibility that hazardous waste may have leached into soil from septic tank system.

Notes:
CTO = Contract Task Order
RWQCB = Regional Water Quality Control Board
CCCEHD = Contra Costa County Environmental Health Department
PCB = Polychlorinated Biphenyls
UST = Underground Storage Tank

TABLE 2
SUMMARY OF PAST RELEASES AND POTENTIAL FOR RELEASES AT SOLID WASTE MANAGEMENT UNITS

SWMU No.	Description	Past Releases	Potential for Releases
INLAND AREA SWMUs			
1	Building IA-6 (Boiler House)	Yes	Soil and groundwater
2	Building IA-7 (Shallow Burn Pit South of Building IA-7)	Yes	Soil and groundwater
3	Building IA-8 (Explosive Ordnance Disposal Detachment Building)	No	None
4	Building IA-10 (Print Shop)	No	None
5	Building IA-12 (Locomotive Repair Shop)	Yes (battery acid to shower drain)	Soil and groundwater
6	Building IA-15 (Automotive Vehicle Maintenance Division)	No	None
7	Building IA-16 (Public Works Shop and Auto Vehicle Maintenance Division)	Possible (wet surfaces satellite area)	Soil and groundwater
8	Building IA-20 (Chemical Laboratory)	Yes	Soil and groundwater
9	Building IA-21 (Material Testing Laboratory)	No	None
10	Building IA-21A	No	None
11	Building IA-22 (Photography Laboratory)	Possible (to sink)	Groundwater
12	Building IA-24 (Forklift Maintenance Building)	Yes (small spill and septic tank)	Soil and groundwater
13	Building IA-25 (Missile Component Maintenance)	Possible (septic tank)	Soil and groundwater

TABLE 2
SUMMARY OF PAST RELEASES AND POTENTIAL FOR RELEASES AT SOLID WASTE MANAGEMENT UNITS
(Continued)

SWMU No.	Description	Past Releases	Potential for Releases
14	Building IA-27 (Car Blocking Shop)	Possible (septic tank)	Air, soil, and groundwater
15	Building IA-41 (Paint Storage Shop)	Possible	Air, soil, and groundwater
16	Building IA-46 (Public Works Maintenance Building)	Possible	Air, soil, and groundwater
17	Building IA-50 (Rail/Truck Transfer Depot)	Possible (septic tank)	Soil and groundwater
18	Building IA-51 (Auto Vehicle Maintenance Facility)	Yes (storm drain)	Soil and groundwater
19	Building IA-54 (Electric Substation)	No	None
20	Building IA-55 (Ordnance Operations Building)	Possible	Soil and groundwater
21	Building IA-58 (X-ray Building)	No	None
22	Building 81 (Ordnance Maintenance and Test Building)	Possible (septic tank)	Air, soil, and groundwater
23	Building 87 (Storage Building)	Possible (septic tank)	Soil and groundwater
24	Building 93 (Guided Missile Division)	Possible (septic tank)	Soil and groundwater
25	Building 97 (Ordnance Assembly Building)	Possible (septic tank)	Soil and groundwater
26	Building 178 (Former Navy Exchange Service Station)	Yes	Soil and groundwater
27	Building 193 (Auto Hobby Shop)	No	None

TABLE 2
SUMMARY OF PAST RELEASES AND POTENTIAL FOR RELEASES AT SOLID WASTE MANAGEMENT UNITS
(Continued)

SWMU No.	Description	Past Releases	Potential for Releases
28	Building 263 (Ordnance Maintenance)	No	None
29	Building 429 (Hazardous Waste Accumulation Shed)	No	None
30	UNOCAL Corp. (Oil Pipeline Spill Site)	Yes	Soil and groundwater
31	Diesel fuel oil leak near main entrance to the Inland Area	Yes	Soil
32	Site 5AT Underground Storage Tank (Abandoned Tank No. 17)	No	Soil and groundwater
33	Site 6LC98 Underground Storage Tank (Magazine Boiler UST)	Yes	Soil and groundwater
TIDAL AREA SWMUs			
34	Building A-3 (Public Works Heavy Equipment Maintenance and Storage)	Yes (UST leak)	Soil and groundwater
35	Building A-10 (Public Works Shop)	No	None
36	Building A-22 (Ordnance Operations Building)	Yes (to sink)	Soil and surface water
37	Building A-29 (Dunnage Salvage Yard)	Possible (leaching from treated wood)	Soil, groundwater, and surface water
38	Building E-61 (Navy's General Warehouse)	No	None
39	Building 109 (Air Force Storage Office)	No	None
40	Building 174 (Electric Substation)	Possible (history of PCB leak and storage)	Soil and groundwater

TABLE 2
SUMMARY OF PAST RELEASES AND POTENTIAL FOR RELEASES AT SOLID WASTE MANAGEMENT UNITS
(Continued)

SWMU No.	Description	Past Releases	Potential for Releases
41	Building 177 (Transfer facility)	No	None
42	Building 188 (Coast Guard Office)	No	None
43	Building 267 (Tug Boat Office)	No	None
44	Building 350 (Ordnance Maintenance Building)	Possible (septic tank)	Soil and groundwater
45	Leak on Paved Wharf Tidal Area	Yes	Soil, groundwater, and surface water
46	Site E-111 Underground Storage Tank (Heating Plant)	Yes (leak from UST)	Soil and groundwater
47	R Area Building (Segregation facilities)	No	None
48	Pacific Gas and Electric Company (Cutting Oil from a pipeline near Hastings Slough and Waterfront Road)	Yes	Soil, groundwater, and spill of surface water
Pittsburg, California Radiographic Facility			
49	Building 35 (X-ray facility at Pittsburg, California)	Yes (PCB leak on cement)	Soil and groundwater

Notes:

UST = Underground Storage Tank
PCB = Polychlorinated Biphenyls

Source: RCRA Facility Assessment (DTSC 1992)

TABLE 3
SUMMARY OF FINDINGS AND RECOMMENDATIONS FOR THE SOLID WASTE MANAGEMENT UNITS

SWMU No.	Documented Releases	Suspected Releases	Potential for Future Releases	Prioritization
1	Yes	Yes	High	High
2	Yes	Yes	High	High
3	No	No	Low	NFA
4	No	No	Low	NFA
5	Yes	Yes	Medium	Medium
6	No	No	Low	NFA
7	No	Yes	Low	Low
8	Yes	Yes	High	High
9	No	No	Low	NFA
10	No	No	Low	NFA
11	No	Yes	High	NFA(a)
12	Yes	Yes	Medium	Medium
13	No	Yes	Medium	Medium
14	No	Yes	Medium	Medium
15	No	Yes	Medium	Medium
16	No	Yes	Low	Low
17	No	Yes	Medium	Medium
18	Yes	Yes	High	High
19	No	No	Low	NFA
20	No	Yes	Medium	Medium
21	No	No	Low	NFA
22	No	Yes	Medium	Medium
23	No	Yes	Medium	Medium
24	No	Yes	Medium	Medium

TABLE 3
SUMMARY OF FINDINGS AND RECOMMENDATIONS FOR THE SOLID WASTE MANAGEMENT UNITS
(Continued)

SWMU No.	Documented Releases	Suspected Releases	Potential for Future Releases	Prioritization
25	No	Yes	Medium	Medium
26	Yes	Yes	High	High
27	No	No	Low	NFA
28	No	No	Low	NFA
29	No	No	Low	NFA
30	Yes	Yes	Low	High(b)
31	Yes	Yes	Low	NFA(c)
32	No	Yes	Low	NFA
33	Yes	Yes	High	High
34	Yes	Yes	Low	NFA(c)
35	No	No	Low	NFA
36	No	No	Low	NFA
37	No	Yes	Medium	Medium
38	No	No	Low	NFA
39	No	No	Low	NFA
40	No	Yes	Low	Low
41	No	No	Low	NFA
42	No	No	Low	NFA
43	No	No	Low	NFA
44	Yes	Yes	Medium	Medium
45	Yes	Yes	Low	NFA(c)
46	Yes	Yes	High	High
47	No	No	Low	NFA

TABLE 3
SUMMARY OF FINDINGS AND RECOMMENDATIONS FOR THE SOLID WASTE MANAGEMENT UNITS
(Continued)

SWMU No.	Documented Releases	Suspected Releases	Potential for Future Releases	Prioritization
48	Yes	Yes	Low	NFA(c)
49	Yes	Yes	Low	NFA(c)

Notes:

NFA = No Further Action

a = The facility was informed of the need to have the unit in the permit application so that compliance would be enforced.

b = recommendations for an RFI is high because of possible groundwater contamination and potential future releases from the contaminated soil near the Contra Costa Canal.

c = These SWMUs with documented releases were remediated.

Source: RCRA Facility Assessment (DTSC 1992)

TABLE 4
SUMMARY OF SOIL AND GROUNDWATER SAMPLE ANALYSIS RESULTS

SOLID WASTE MANAGEMENT UNITS

Analyte	SWMU 1											SWMU 12/20				
	Soil Pit Sample (1) (mg/kg)	Water MW-1 (3) (µg/L)	Water MW-2 (2) (µg/L)	Water MW-2 (4) (µg/L)	Water MW-3 (4) (µg/L)	Water MW-4 (2) (µg/L)	Water MW-4 (4) (µg/L)	Water MW-5 (4) (µg/L)	Water MW-6 (4) (µg/L)	Soil DH-1-10 (4) (mg/kg)	Soil MW-5-10 (4) (mg/kg)	Soil ACS-01 (5) (mg/kg)	Soil ACS-02 (5) (mg/kg)	Soil ACS-06 (5) (mg/kg)	Water ACS-06 (5) (µg/L)	Soil ACS-13 (5) (mg/kg)
PETROLEUM HYDROCARBONS																
TPHd	6,400	110,000	6,500	ND	ND	3,700	ND	ND	ND	460	80	17.8	164	'5.36	364	5.79
TPHg	–	–	–	–	–	–	–	–	–	–	–	–	0.082	0.131	–	–
VOCs																
PCE	–	–	–	5.0	3.4	–	3.3	5.0	5.1	–	–	–	–	–	–	–
1,1-DCE	–	–	–	ND	ND	–	ND	0.9	0.8	–	–	–	–	–	–	–
TCE	–	–	–	ND	ND	–	ND	1.1	ND	–	–	–	–	–	1	–
Chloroform	–	–	–	ND	ND	–	ND	3.1	ND	–	–	–	–	–	–	–
Methylene chloride	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
Total xylenes	–	–	–	ND	ND	–	ND	ND	ND	1.0	0.01	–	–	–	2	–
GENERAL CHEMISTRY																
Sulfate	–	–	–	–	–	–	–	–	–	–	–	0.067	0.044	0.154	'88.90	'1.13
pH	–	–	–	–	–	–	–	–	–	–	–	7.58	7.21	'8.81	7.47	'8.83

TABLE 4
SUMMARY OF SOIL AND GROUNDWATER SAMPLE ANALYSIS RESULTS
(Continued)

SOLID WASTE MANAGEMENT UNITS

Analyte	SWMU 22		SWMU 50								SWMU 52			
	Boring No. 1 [6]		Test Pit E-85 [7]			E-85 West [7]	Building 85 MW-1	Boring No. 7 [6]			SB-1[5]	[5]	Boring No. 2[4]	
	Soil 15.25 feet (mg/kg)	Groundwater (µg/L)	Soil 2.0 feet (mg/kg)	Soil 4.0 feet (mg/kg)	Ground-water (µg/L)	Soil 4.0 feet (mg/kg)	Ground-water (µg/L)	Soil 4.25 feet (mg/kg)	Soil 7.5 feet (mg/kg)	Ground-water (µg/L)	Soil 3.5 feet (mg/kg)	Composite Soil Sample (mg/kg)	Soil 4.5 feet (mg/kg)	Soil 8.0 feet (mg/kg)
PETROLEUM HYDROCARBONS														
TPHd	850	5,600	75	95	150,000	450	520	12,000	98	100	14.6	9.23	7,700	1,600
TOG	--	--	ND	ND	45,000	--	--	--	--	--	--	--	--	--
VOC														
Toluene	--	--	--	--	--	--	--	--	--	--	--	13	--	--
SVOC														
Bis(2-ethylhexyl phthalate	--	--	--	--	--	--	--	--	--	--	--	1.1	--	--
Acenaphthalene	--	--	--	--	--	--	--	--	--	--	--	--	1.0	--
Fluorene	--	--	--	--	--	--	--	--	--	--	--	--	2.4	--
2-methy-naphthalene	--	--	--	--	--	--	--	--	--	--	--	--	5.5	--
Naphthalene	--	--	--	--	--	--	--	--	--	--	--	--	4.6	0.7

Notes:

* = Maximum concentration detected
TPHd = Total petroleum hydrocarbons as diesel
TOG = Total oil and grease
TPHg = Total petroleum hydrocarbons as gasoline
PCE = Tetrachloroethylene
DCE = Dichloroethylene
TCE = Trichloroethylene

µg/L = micrograms per liter
mg/kg = milligrams per kilogram
-- = Not analyzed
ND = Not detected above the detection limit
VOC = Volatile Organic Compounds
SVOC = Semi-volatile Organic Compounds

Sources:

(1) Riedel (June 1989)
(2) PRC (September 1990)
(3) PRC (November 1990)
(4) Fugro-McClelland (1993)
(5) PRC/Montgomery Watson (1993)
(6) HLA (September 1993)
(7) WPNSTA Concord (December 1993 and January 1994)

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TABLE 5
SUMMARY OF SEPTIC TANK SLUDGE AND LIQUID SAMPLE ANALYSIS RESULTS

		Building Number / Solid Waste Management Unit											
Analyte	**Year Sampled**	**24/55 12/20**	**25 13**	**50 17**	**81 22**	**87 23**	**93 24**	**97 25**	**350 44**	**56 51**	**7SH5 52**	**7SH14 53**	**79 54**
PETROLEUM HYDROCARBONS (mg/L - liquid only)													
TRPH	(1990)	--	390	67	4,500	--	ND	ND	--	--	ND	ND	--
	Sludge (1993)	1,400	ND	ND	100	ND	260	--	ND	ND	ND	ND	ND
TOG	(1993)	--	--	380	220	15	--	160	45	ND	300	420	100
	(1990)	--	650	80	990	--	310	81	--	--	220	220	--
	Sludge (1993)	4,900	780	--	--	--	2,400	--	--	--	--	--	--
VOCs (µg/L)													
1,4-dichlorobenzenzene	(1993)	ND	ND	ND	ND	ND	ND	ND	8.4	ND	ND	ND	ND
	(1990)	--	36	100	ND	--	ND	20	--	--	170	ND	--
1,1-DCA	(1990)	--	48	ND	ND	--	ND	ND	--	--	ND	ND	--
1,2-DCA	(1990)	--	12	ND	ND	--	ND	ND	--	--	ND	ND	--
1,1-DCE	(1990)	--	21	ND	ND	--	ND	ND	--	--	ND	ND	--
Total 1,2-DCE	(1990)	--	1,100	ND	ND	--	ND	ND	--	--	ND	ND	--
TCE	(1990)	--	2.8	ND	ND	--	ND	ND	--	--	ND	ND	--
Benzene	(1990)	--	ND	8.3	ND	--	ND	ND	--	--	ND	ND	--
Toluene	(1993)	ND	ND	ND	ND	ND	ND	ND	16	ND	ND	ND	ND
	(1990)	--	27	ND	ND	--	20	ND	--	--	17	ND	--
Chlorobenzene	(1990)	--	ND	130	ND	--	ND	ND	--	--	ND	ND	--

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TABLE 5
SUMMARY OF SEPTIC TANK SLUDGE AND LIQUID SAMPLE ANALYSIS RESULTS
(Continued)

		Building Number / Solid Waste Management Unit											
Analyte	Year Sampled	24/55 12/20	25 13	58 17	81 22	87 23	93 24	97 25	358 44	56 51	7SH5 52	7SH14 53	79 54
SVOCs (µg/L)													
1,3-dichlorobenzene	(1993)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	120
1,4-dichlorobenzene	(1993)	ND	ND	ND	4	ND	ND	2.1	7.5	ND	150	ND	ND
	(1990)	--	79	130	ND	--	ND	12	--	--	120	ND	--
4-methylphenol	(1993)	ND	ND	ND	22	230	ND	21	120	130	120	ND	ND
	(1990)	--	30	ND	92	--	440	50	--	--	930	ND	--
Phenol	(1993)	ND	ND	ND	ND	74	ND	2.6	ND	22	ND	ND	ND
	(1990)	--	0.32	0.28	0.67	--	75	4.3	--	--	100	ND	--
2,4-dichlorophenol	(1993)	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	59
Naphthalene	(1993)	ND	ND	ND	ND	ND	ND	ND	ND	ND	31	ND	ND
	(1990)	--	ND	ND	ND	--	ND	ND	--	--	59	ND	--
Di-n-octylphthalate	(1990)	--	1,000	ND	690	--	ND	ND	--	--	ND	ND	--
Diethylphthalate	(1993)	ND	ND	ND	ND	4.5	ND	ND	--	ND	ND	ND	ND
Butyl benzyl phthalate	(1993)	ND	ND	ND	ND	5.0	ND	ND	--	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate	(1993)	ND	ND	ND	ND	20	ND	ND	--	ND	ND	ND	ND
Benzoic acid	(1993)	ND	ND	ND	ND	640	ND	ND	ND	97	ND	ND	ND
	(1990)	--	ND	ND	ND	--	1,200	ND	--	--	810	ND	--
Chrysene	(1990)	--	ND	ND	ND	--	ND	5.8	--	--	ND	ND	--
Benzo(a)anthracene	(1990)	--	ND	ND	ND	--	ND	6.2	--	--	ND	ND	--
Benzo(b)fluoranthene	(1990)	--	ND	ND	ND	--	ND	6.8	--	--	ND	ND	--
Benzo(k)fluoranthene	(1990)	--	ND	ND	ND	--	ND	6.9	--	--	ND	ND	--
Benzo(a)pyrene	(1990)	--	ND	ND	ND	--	ND	7.4	--	--	ND	ND	--

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TABLE 5
SUMMARY OF SEPTIC TANK SLUDGE AND LIQUID SAMPLE ANALYSIS RESULTS
(Continued)

Analyte	Year Sampled	Building Number / Solid Waste Management Unit											
		24/55 12/20	25 13	50 17	81 22	87 23	93 24	97 25	350 44	56 51	7SH5 52	7SH14 53	79 54
Dibenz(a,h)anthracene	(1990)	--	ND	ND	ND	--	ND	9.5	--	--	ND	ND	--
METALS (µg/L)													
Antimony	(1993)	ND	ND	ND	0.11	0.11	ND	ND	ND	0.18	ND	ND	ND
Barium	(1993)	33	ND	ND	ND	ND	ND	ND	ND	1.5	ND	0.29	ND
Cadmium	(1993)	1.9	ND	ND	ND	0.024	ND	ND	ND	ND	ND	0.013	ND
	(1990)	--	0.20	0.14	4.2	--	ND	0.010	--	--	ND	ND	--
Chromium	(1993)	6.0	ND	ND	0.014	ND	ND	ND	ND	0.12	ND	0.027	ND
	(1990)	--	0.22	0.11	19	--	0.012	0.012	--	--	0.012	ND	--
Cobalt	(1993)	ND	ND	ND	ND	ND	ND	ND	ND	0.08	ND	ND	ND
Copper	(1993)	30	ND	ND	0.11	0.38	0.99	ND	0.018	0.29	ND	0.88	ND
	(1990)	--	1.1	0.98	120	--	0.018	0.023	--	--	0.028	0.022	--
Cyanide	(1993)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	(1990)	--	0.015	0.042	--	--	ND	ND	--	--	ND	ND	--
Lead	(1993)	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	(1990)	--	0.50	0.54	12	--	0.0097	0.0061	--	--	ND	0.0097	--
Mercury	(1993)	ND	ND	0.12	ND	ND	0.0025	ND	ND	ND	ND	0.008	ND
Nickel	(1993)	ND	ND	ND	ND	ND	ND	ND	ND	0.33	ND	ND	ND
	(1990)	--	0.054	0.12	2.0	--	ND	ND	--	--	ND	ND	--
Silver	(1993)	1.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	(1990)	--	0.022	0.014	ND	--	ND	ND	--	--	ND	ND	--
Vanadium	(1993)	ND	ND	ND	ND	ND	ND	ND	ND	0.24	ND	ND	ND

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TABLE 5
SUMMARY OF SEPTIC TANK SLUDGE AND LIQUID SAMPLE ANALYSIS RESULTS
(Continued)

		Building Number / Solid Waste Management Unit											
Analyte	Year Sampled	24/55 12/20	25 13	58 17	81 22	87 23	93 24	97 25	350 44	56 51	7SH5 52	7SH14 53	79 54
METALS (continued)													
Zinc	(1993)	110	ND	3.3	0.12	0.14	4.0	0.023	0.11	2.1	2.0	2.5	0.059
	(1990)	--	5.2	25	140	--	0.076	0.093	--	--	0.049	0.055	--

Notes:

Samples are liquid unless otherwise noted.
All sludge sample results in milligrams per kilogram (mg/kg).
mg/L = milligrams per liter
µg/L = micrograms per liter
ND = Not detected above the detection limit
-- = Not analyzed
DCA = Dichloroethane
DCE = Dichloroethene
SVOC = Semi-volatile Organic Compound
TOG = Total oil and grease
TRPH = Total recoverable petroleum hydrocarbons
TCE = Trichloroethylene
VOC = Volatile Organic Compound

TABLE 6
NOVEMBER 10, 1988 SOIL SAMPLE ANALYSIS RESULTS - BUILDING IA-25 (SWMU 13)

Analyte	Sample Number				
	IA25-1	IA25-2	IA25-4	IA25-5	IA25-7
VOCs					
1,1,1-Trichloroethane	ND	ND	ND	ND	13
2-Butanone (MEK)	480	ND	ND	ND	ND
SVOCs					
Fluoranthene	ND	6,400	ND	ND	5,200
Anthracene/ Phenanthrene	ND	7,000	ND	ND	3,500
Pyrene	ND	4,500	ND	ND	3,700
Benzo(a)anthracene/chrysene	ND	1,900	ND	ND	ND
ORGANOCHLORINE PESTICIDES					
4,4'-DDD	ND	ND	120	ND	ND
4,4'-DDT	ND	ND	230	ND	ND
METALS					
Lead	3,400**	63	1,500*	630*	89
Cyanide	2.2	ND	1	ND	ND
Zinc	20,000**	200	4,300	1,300	310
Trivalent chromium	2,600**	46	150	160	84
METALS (continued)					
Cadmium	32	2	10*	3.9	2

Notes:

VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
ND = Not detected above the detection limits
-- = Not analyzed
* = Exceeds soluble threshold limit concentrations (STLC)
** = Exceeds State of California total threshold limit concentrations (TTLC)
All concentrations in parts per million (ppm)

Source: IT report dated January 1990 (IT 1990)

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TABLE 7
JUNE 28, 1989 SOIL SAMPLE ANALYSIS RESULTS - BUILDING IA-25 (SWMU 13)

Analyte	Sample Identification							
	SS-01-1	SS-01-2	SS-02-1	SS-02-2	SS-03-1	SS-03-2	SS-04-1	SS-04-2
VOCs								
Methylene Chloride	ND	ND	8	7	ND	ND	ND	ND
Xylenes	ND	ND	9	15	ND	ND	ND	ND
SVOCs								
Fluoranthene	ND	ND	360	370	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	ND	ND	240	110	ND	ND	ND	ND
Benzo(a)anthracene/chrysene	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene/Phenanthrene	ND	ND	310	75	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate	ND	ND	1,100	ND	ND	ND	ND	ND
Benzo(b/k)fluoranthene	ND	ND	260	190	ND	ND	ND	ND
Acenaphthene	ND	ND	52	ND	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	150	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	400	ND	ND	ND	ND	ND
ORGANOCHLORINE PESTICIDES								
4,4'-DDT	24	ND	ND	ND	54	ND	20	48
Beta-BHC	ND	ND	ND	ND	ND	ND	ND	ND
CHLORINATED HERBICIDES								
2,4,5-TP (Silvex)	ND	ND	ND	ND	ND	ND	ND	13
2,4-DB	ND	ND	ND	ND	ND	ND	ND	ND
Dinoseb	ND	ND	ND	ND	ND	ND	17	23
METALS								
Lead	32	11	99	180	45	32	32	15
Cyanide	2	ND	ND	2	ND	5	ND	ND
Zinc	140	95	100	630	98	240	94	110
Trivalent chromium	64	67	21	87	46	67	63	75
Cadmium	ND	ND	ND	2	ND	ND	ND	ND
Potassium	1,100	ND	ND	ND	1,350	1,340	1,100	1,400

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TABLE 7
JUNE 28, 1989 SOIL SAMPLE ANALYSIS RESULTS - BUILDING IA-25 (SWMU 13) (Continued)

Analyte	Sample Identification							
	SS-05-1	SS-05-2	SS-06-1	SS-06-2	SS-07-1	SS-07-2	SS-08-1	SS-08-2
VOCs								
Methylene Chloride	ND	ND	ND	ND	10	11	ND	ND
Xylenes	ND	ND	ND	ND	ND	ND	ND	ND
SVOCs								
Fluoranthene	ND	ND	ND	ND	890	190	ND	ND
Phenanthrene	ND	ND	ND	ND	670	ND	ND	ND
Pyrene	ND	ND	ND	ND	630	ND	ND	ND
Benzo(a)anthracene/chrysene	ND	ND	ND	ND	450	78	ND	ND
Anthracene/phenanthrene	ND	ND	ND	ND	590	120	ND	ND
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	3,900	ND	ND	ND
Benzo(b/k)fluoranthene	ND	ND	ND	ND	480	ND	ND	ND
Naphthalene	ND	ND	ND	ND	40	ND	ND	ND
ORGANOCHLORINE PESTICIDES								
4,4'-DDT	ND	ND	34	ND	17	ND	ND	ND
Beta-BHC	ND	ND	ND	ND	ND	32	ND	ND
CHLORINATED HERBICIDES								
2,4,5-TP (Silvex)	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DB	ND	ND	ND	53	ND	ND	ND	66
Dinoseb	ND	ND	ND	ND	12	ND	14	12
METALS								
Lead	72	23	290	250	800	11	690	240
Cyanide	ND	ND	22	11	ND	ND	3	3
Zinc	56	120	350	340	190	85	1,250	520
Trivalent chromium	42	47	71	38	85	58	160	100
Cadmium	ND	ND	2	2	ND	ND	8	4
Potassium	ND	1,100	ND	ND	1,310	ND	1,200	1,410

Notes:
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
Source: IT Report dated January 1990 (IT 1990)

All concentrations in parts per million (ppm)
ND = Not detected above the detection limit

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TABLE 8
SUMMARY OF WASTES GENERATED AND COPCS AT EACH SWMU

SWMU No./ Building	Activity	Wastes Generated	COPC
1 IA-6	Boiler House	Petroleum products	VOCs, TOG, TPHd, and pH
2 IA-7	Fire Station	Petroleum products, fire extinguisher chemicals, and napalm	TPHd, TPHg, BTEX, metals, anions, and carbonates
5 IA-12	Locomotive Repair	Petroleum products and battery acid	VOCs, SVOCs, metals, TPHd, TPHg, TOG, BTEX, and pH
7 IA-16	Public Works Shop	Petroleum products, paint thinners, paint, and solvents	VOCs, metals, TPHd, TPHg, and BTEX
12 IA-24	Forklift Maintenance	Petroleum products, paint thinners, paint, battery acid, and solvents	VOCs, SVOCs, TOG, metals, and pH
13 IA-25	Missile Component Maintenance	Petroleum products, paint thinners, paint, explosives, and solvents	VOCs, SVOCs, TOG, and metals
14 IA-27	Carpenter Shop	Paint thinners, paint, and solvents	VOCs, SVOCs, TOG, and metals
15 IA-41	Paint Storage Shop	Paint thinners and paint	VOCs and metals
16 IA-46	Public Works Storage	Asbestos and pesticides	Asbestos and pesticides
17 IA-50	Rail/Truck Transfer Depot	Paint thinners, paint, and solvents	VOCs, SVOCs, TOG, and metals
18 IA-51	Vehicle Maintenance	Petroleum products, antifreeze, and Freon	VOCs, SVOCs, TPHd, BTEX, TOG, and metals
20 IA-55	Ordnance Operations	Petroleum products, paint, and adhesives	VOCs, SVOCs, TOG, metals, and pH
22 81	Ordnance Maintenance	Petroleum products, paint, and solvents	VOCs, SVOCs, TOG, and metals
23 87	Storage Building	Petroleum products, paint, and solvents	VOCs, SVOCs, TPHd, TOG, and metals
24 93	Guided Missile Division	Paint, adhesives, and solvents	VOCs, SVOCs, TOG, and metals

TABLE 8
SUMMARY OF WASTES GENERATED AT COPCS AT EACH SWMU
(Continued)

SWMU No./ Building	Activity	Wastes Generated	COPC
25 97	Ordnance Assembly Building	Petroleum products, solvents, contact cleaners, and corrosion preventers	VOCs, SVOCs, TOG, and metals
37 A-29	Dunnage Salvage Yard	Creosote, pentachlorophenol, and copper arsenate	VOCs, SVOCs, pesticides/PCBs, explosive compounds, metals, TOC, and pH
40 174	Electric Substation	Petroleum products and PCBs	TPHd, BTEX, and PCBS
44 350	Marine Ordnance Building	Petroleum products, paint, and solvents	VOCs, SVOCs, TOG, and metals
50 E-108	Former Boiler House	Petroleum products	TPHd, BTEX, and TOG
51 1A-56	Forklift Training	Petroleum products, paint, and solvents	VOCs, SVOCs, TOG, and metals
52 7SH5	Missile Repair	Petroleum products, paint thinners, paint, and solvents	VOCs, SVOCs, TOG, and metals
53 7SH14	Storehouse	Petroleum products, paint thinners, paint, and solvents	VOCs, SVOCs, TOG, and metals
54 79	Guardhouse	Petroleum products, paint thinners, paint, and solvents	VOCs, SVOCs, TOG, and metals

Notes:

VOC = Volatile Organic Compounds
SVOC = Semivolatile Organic Compounds
TOG = Total Oil and Grease
TPHd = Total Petroleum Hydrocarbons as Diesel
TPHg = Total Petroleum Hydrocarbons as Gasoline
BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes
TOC = Total Organic Carbon
PCBs = Polychlorinated Biphenyls

TABLE 9
SUMMARY OF SOIL AND WATER SAMPLING

SWMU/ Building No.		Number of Sampling Locations	Samples per Boring or Trench	Surface Samples*	Total Number of Field Samples		Field QC		Comments
					Soil	Water	Duplicate	Rinseate	
INLAND AREA SWMU									
1 IA-6	Soil Borings	3	4	1	13			1	Drill to groundwater (20 feet)
	Wells	6				6	1	1	Sample existing wells
2 IA-7	Shallow Borings	8	1	8	16			1	Hand-auger to 5 feet
	Soil Borings	1	3	1	4			1	Drill to 15 feet
	Trenches	3	3		9			1	10 feet long, 4 feet deep
5 IA-12	Shallow Borings	4	1	4	8			1	Hand-auger to 5 feet
	Soil Borings	4	4		16			2	Drill to groundwater (20 feet)
	HydroPunch Samples	4				4	1	1	Sample from soil borings
7 IA-16	Shallow Borings	5	1	5	10			1	Hand-auger to 5 feet
	Soil Borings	4	4		16			1	Drill to groundwater (20 feet)
	HydroPunch Samples	4				4	1	1	Sample from soil borings
12/20 IA-24 IA-55	Shallow Borings	4	2		8			1	Hand-auger to 5 feet
	Soil Borings	3	3		9			1	Drill to 15 feet
	Septic Tanks	2		2	2	2			Sludge and liquid samples

TABLE 9
SUMMARY OF SOIL AND WATER SAMPLING
(Continued)

SWMU/ Building No.		Number of Sampling Locations	Samples per Boring or Trench	Surface Samples*	Total Number of Field Samples		Field QC		Comments
					Soil	Water	Duplicate	Rinseate	
13 IA-25	Shallow Borings	1 2	1 2	1	2 4			1	Hand-auger to 5 feet Hand-auger to 5 feet
	Soil Borings	3	3		9			1	Drill to 15 feet
	Surface Water	1				1			Pit drain outfall
	Septic Tank	1		1	1	1			Sludge and liquid samples
14 IA-27	Shallow Borings	3 2	1 2	3	6 4			1	Hand-auger to 5 feet Hand-auger to 5 feet
	Soil Borings	3	3		9			1	Drill to 15 feet
	Septic Tank	1		1	1	1			
15 IA-41	Shallow Borings	3	1	3	6			1	Hand-auger to 5 feet
16 IA-46	Shallow Borings	5	1	5	10			1	Hand-auger to 5 feet
	Soil Borings	1	3	1	4			1	Drill to 15 feet
17 IA-50	Shallow Borings	2	2		4			1	Hand-auger to 5 feet
	Soil Borings	3	3		9			1	Drill to 15 feet
	Septic Tank	1		1	1	1			Sludge and liquid samples
18 IA-51	Shallow Borings	4	1	4	8			1	Hand-auger to 5 feet
	Soil Borings	2	4		8			1	Drill to groundwater (20 feet)
	Surface Water	2				2			Drainage ditch
	HydroPunch Samples	2				2	1	1	Sample from soil borings

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TABLE 9
SUMMARY OF SOIL AND WATER SAMPLING
(Continued)

SWMU/ Building No.		Number of Sampling Locations	Samples per Boring or Trench	Surface Samples*	Total Number of Field Samples		Field QC		Comments
					Soil	Water	Duplicate	Rinseate	
22 Bldg 81	Shallow Borings	7	2		14			1	Hand-auger to 5 feet
	Soil Borings	2	3		6			1	Drill to 15 feet
	Surface Water	1				1			Drainage ditch
	Septic Tank	1		1	1	1			Sludge and liquid samples
23 Bldg 87	Shallow Borings	4	2		8			1	Hand-auger to 5 feet
	Soil Borings	3	3		9			1	Drill to 15 feet
	Septic Tank	1		1	1	1			Sludge and liquid samples
24 Bldg 93	Shallow Borings	4	2		8			1	Hand-auger to 5 feet
	Soil Borings	2	3		6			1	Drill to 15 feet
	Septic Tank	1		1	1	1			Sludge and liquid samples
25 Bldg 97	Shallow Borings	4	2		8			1	Hand-auger to 5 feet
	Soil Borings	2	3		6			1	Drill to 15 feet
	Septic Tank	1		1	1	1			Sludge and liquid samples
51 IA-56	Shallow Borings	4	2		8			1	Hand-auger to 5 feet
	Soil Borings	2	3		6			1	Drill to 15 feet
	Septic Tank	1		1	1	1			Sludge and liquid samples
52 7SH5	Shallow Borings	2 4	1 2	2	4 8			1	Hand-auger to 5 feet
	Soil Borings	2	3		6			1	Drill to 15 feet
	Surface Water	1				1			Drainage Ditch
	Septic Tank	1		1	1	1			Sludge and liquid samples

TABLE 9
SUMMARY OF SOIL AND WATER SAMPLING
(Continued)

SWMU/ Building No.		Number of Sampling Locations	Samples per Boring or Trench	Surface Samples*	Total Number of Field Samples		Field QC		Comments
					Soil	Water	Duplicate	Rinseate	
53 7SH14	Shallow Borings	4	2		8			1	Hand-auger to 5 feet
	Soil Borings	2	3		6			1	Drill to 15 feet
	Septic Tank	1		1	1	1			Sludge and liquid samples
54 Bldg 79	Shallow Borings	8	2		16			1	Hand-auger to 5 feet
	Soil Borings	4	3		12			1	Drill to 15 feet
	Septic Tanks	2		2	2	2			Sludge and liquid samples
Total					345	35	4	42	
TIDAL AREA SWMU									
37 A-29	Shallow Borings	10	1	10	20			2	Hand-auger to 5 feet
	Soil Borings	2	3		6			1	Drill to groundwater (10 feet)
	HydroPunch	2				2	1	1	Sample from soil borings
40 Bldg 174	Shallow Borings	3	1	3	6			1	Hand-auger to 5 feet

TABLE 9
SUMMARY OF SOIL AND WATER SAMPLING
(Continued)

SWMU/ Building No.		Number of Sampling Locations	Samples per Boring or Trench	Surface Samples*	Total Number of Field Samples		Field QC		Comments
					Soil	Water	Duplicate	Rinseate	
44 Bldg 350	Shallow Borings	2	2		4			1	Hand-auger to 5 feet
	Soil Borings	2	2		4			1	Install monitoring wells
	Wells	2				2	1	1	Sample two new wells
	Septic Tank	1		1	1	1			Sludge and liquid samples
50 E-108	Soil Borings	4	2		8			1	Install monitoring wells
	Wells	3				3	1	1	Sample two new and one existing monitoring wells
TOTAL					49	8	3	10	
TOTAL INLAND AND TIDAL AREAS					394	43	7	52	

* Includes septic tank samples.

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CONCORD.TBL, 11/30/94

TABLE 10
SUMMARY OF SOIL ANALYSES

SWMU No.	CLP VOC	CLP SVOC	Metals	TOG	TPHg	TPHd	BTEX	Asbestos	pH	Explosive Compounds	Pesticides/ PCBs
1 IA-6	13			13		13			13		
* 2 IA-7			29		29	29	29				
5 IA-12	8	8	16	12	4	16	8		12		
7 IA-16	14		14		12	12	12				
12/20 IA-12/IA-55	19	19	19	19					19		
13 IA-25	16	16	16	16						16	5
14 IA-27	20	20	20	20							
15 IA-41	6	6	6								
16 IA-46			8					14			8
17 IA-50	14	14	14	14							
18 IA-51	4	4	16	8		8	4				
22 81	21	21	21	21						21	
23 87	18	18	18	18		3					
24 93	15	15	15	15							
25 97	15	15	15	15							

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CONCORD.TBL, 11/30/94

TABLE 10
SUMMARY OF SOIL ANALYSES
(Continued)

SWMU No.	CLP VOC	CLP SVOC	Metals	TOG	TPHg	TPHd	BTEX	Asbestos	pH	Explosive Compounds	Pesticides/ PCBs
** 37 A-29	26	26	26						26	26	26
40 174						6	6				***6
44 350	9	9	9	9		9					
50 E-108				8		8	8				
51 IA-56	15	15	15	15							
52 Bldg 7SH5	19	19	19	19							
53 Bldg 7SH14	15	15	15	15							
54 Bldg 79	30	30	30	30							
TOTAL	297	270	341	267	45	104	67	14	70	63	45

* Soil samples from SWMU 2 will also be analyzed for anions and carbonates.
** Soil samples from SWMU 37 will also be analyzed for sulfates and TOC.
*** Soil samples from SWMU 40 will be analyzed for PCBs only.

CLP = Contract Laboratory Program
VOC = Volatile Organic Compounds
SVOC = Semi-volatile Organic Compounds
TOG = Total Oil and Grease
TPHg = Total Petroleum Hydrocarbons as Gasoline
TPHd = Total Petroleum Hydrocarbons as Diesel
BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes
PCBs = Polychlorinated biphenyls
TOC = Total Organic Carbon

TABLE 11
SUMMARY OF WATER ANALYSES

SWMU No.	CLP VOC	CLP SVOC	Metals	TOG	TPHg	TPHd	BTEX	Asbestos	pH	Explosive Compounds	Pesticides/ PCBs
1 IA-6	9			9		9					
* 2 IA-7			3		3	3	3				
5 IA-12	9	9	9	9	9	9			9		
7 IA-16	8		8		8	8					
12/20 IA-12/IA-55	4	4	4	4					4		
13 IA-25	4	4	4	4						4	2
14 IA-27	3	3	3	3							
15 IA-41	1		1								
16 IA-46								2			2
17 IA-50	3	3	3	3							
18 IA-51	5	5	8	5		5					
22 81	4	4	4	4						4	
23 87	3	3	3	3		1					
24 93	3	3	3	3							
25 97	3	3	3	3							

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CONCORD.TBL, 11/30/94

TABLE 11
SUMMARY OF WATER ANALYSES
(Continued)

SWMU No.	CLP VOC	CLP SVOC	Metals	TOG	TPHg	TPHd	BTEX	Asbestos	pH	Explosive Compounds	Pesticides/ PCBs
** 37 A-29	7	7	7						7	7	7
40 174						1	1				***1
44 350	7	7	7	7		7					
50 E-108				6		6	6				
51 IA-56	3	3	3	3							
52 Bldg 7SH5	4	4	4	4							
53 Bldg 7SH14	3	3	3	3							
54 Bldg 79	4	4	4	4							
TOTAL	87	69	84	77	20	49	10	2	20	15	12

* Water samples from SWMU 2 will also be analyzed for anions and carbonates.
** Water samples from SWMU 37 will also be analyzed for sulfates and TOC.
*** Water samples from SWMU 40 will be analyzed for PCBs only.

CLP = Contract Laboratory Program
VOC = Volatile Organic Compounds
SVOC = Semi-volatile Organic Compounds
TOG = Total Oil and Grease
TPHg = Total Petroleum Hydrocarbons as Gasoline
TPHd = Total Petroleum Hydrocarbons as Diesel
BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes
PCBs = Polychlorinated biphenyls
TOC = Total Organic Carbon

TABLE 12
SUMMARY OF STANDARD OPERATING PROCEDURES

Section	Activity	SOP #
6.1	UTILITY AND ENVIRONMENTAL CLEARANCE	
6.1.1	Utility Clearances	NA
6.1.2	Geophysical Investigations	NA
6.1.3	State and Local Permitting	NA
6.1.4	Environmental Permitting/Clearance	001
6.2	SOIL INVESTIGATIONS	
6.2.1	Hollow-Stem Auger Drilling	026 and 045
6.2.2	Hand-Augering	044
6.2.3	Geoprobe Sampling	054
6.2.4	Surface Soil Sampling	005
6.2.5	Borehole Sampling Methods	026
6.2.6	Borehole Abandonment	NA
6.2.7	Test Pit Investigation	005
6.3	GROUNDWATER INVESTIGATION	
6.3.1	Monitoring Well Installation	020
6.3.2	Monitoring Well Development	011, 012, 013, 014, 021, 088
6.3.3	Groundwater Sampling	010, 011, 012, 013, 088
6.3.4	HydroPunch Sampling	070
6.4	SEPTIC TANK SAMPLING	005 and 006
6.5	SURFACE WATER SAMPLING	009
6.6	SITE SURVEYING	NA
6.7	DECONTAMINATION PROCEDURES	002
6.8	DISPOSAL OF INVESTIGATION-DERIVED WASTE	NA
6.9	FIELD DOCUMENTATION	024
6.10	SAMPLE IDENTIFICATION	
6.10.1	Field Identification System	NA
6.10.2	Laboratory Identification System	NA

NA = Not Applicable

APPENDIX A

HAZARDOUS WASTE FACILITY PERMIT

California Environmental Protection Agency
Department of Toxic Substances Control

HAZARDOUS WASTE FACILITY PERMIT

Owner: United States of America
Department of the Navy
Concord Naval Weapons Station
Port Chicago Highway
Concord, California 94520

Operator: United States of Amercia
Department of the navy
Concord Naval Weapons Station
Port Chicago Highway
Concord, California 94520

EPA ID Number:	CA 7170024528
Effective Date:	July 31, 1993
Expiration Date:	July 31, 2003

Pursuant to Section 25200 of the California Health and Safety Code, this Hazardous Waste Facility Permit is hereby issued to the United States of America, Department of the Navy, Concord Naval Weapaons Station.

The issuance of this permit is subject to the conditions set forth in Attachment A which consists of 33 pages.

Charlene F. Williams

Charlene F. Williams, Acting Chief
Facility Permitting Branch
Region 2

Date: June 28, 1993

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ATTACHMENT A
Final Hazardous Waste Facility Permit

CONCORD NAVAL WEAPONS STATION
CODE 09203
Port Chicago Highway
CONCORD, CALIFORNIA 94520-5100
EPA I.D. No.: CA 7170024528

I. DESCRIPTION OF FACILITY

I.A. Ownership, Operations, and Location

The United States Navy, Concord Naval Weapons Station (hereafter called the Permittee) is the owner and operator of the treatment and storage facility located off Port Chicago Highway in Concord, Contra Costa County, California. Concord Naval Weapons Station has applied for a permit (1) to treat and store hazardous wastes in containers at Building 433, (2) to store treated wood waste in containers (6 roll-off bins) near Building A-3, and (3) to perform other treatments, such as fluorescent tube crushing at Building IA-46, silver recovery at Buildings IA-18, IA-22 and IA-58.

Most of the wastes stored and/or treated at these locations are generated from various on-site activities related to storage, maintenance, transshipment and technical support of ordnance operations and maintenance of buildings, vehicles and ships. RCRA hazardous waste generated consists of: solvents like trichloroethene, methanol and xylene; paints; varnish; adhesives; antifreeze; batteries; kerosene, ink; and non-RCRA waste such as used oil, asbestos and photographic waste.

Used fluorescent tubes generated at the facility are reduced in bulk by a fluorescent tube crusher located at the east end of Building IA-46. The crusher operates by feeding the florescent tube through a cylindrical metal tube attached to a 55 gallon drum. Once the drum is filled, it is transferred to Building 433 prior to disposal at a permitted Class I disposal facility.

The maximum capacity for storage of drums at Building 433 is 14,080 gallons of waste (256 55-gallon drums). Treatment of hazardous waste at Building 433 is limited to neutralization and repackaging. The six (6) roll-off bins near Building A-3 have a capacity to store 240 cubic yards of waste treated wood. The facility has three silver recovery units which reclaim silver from fixer waste solutions and exposed films. Building IA-18 (Dispensary/Hospital/Dental) and Building IA-22 (Photography Laboratory) generates approximately a gallon a week of photographic waste whereas, Building IA-58 (X-ray Building) generates about 2 ½ gallons per week. The silver recovery unit at Building IA-18 has a maximum holding capacity of 9.4 gallons; that at Building IA-22 has a holding capacity of 4.2 gal; and that at IA-58 has a holding capacity of 7.4 gallon. Each silver recovery unit can treat photographic waste at the rate of 2 gallons per hour.

Concord Naval Weapons Station also serves as the transfer station for torpedo Otto Fuel waste (classified as reactive, D003) and bilge water from ships originating overseas. These wastes are off-loaded directly to a licensed hauler for disposal at a permitted facility. Bilge water from small vessels is drummed and stored as hazardous waste at Building 433.

I.B. Compliance With California Environmental Quality Act (CEQA)

The California Environmental Protection Agency, Department of Toxic Substances Control (Department) conducted the Initial Study on the proposed permit application for a treatment and storage facility as required by the Public Resources Code, Section 21080(c) and State guidelines. The information presented in the Initial Study indicates that no significant effect can be expected from this project. The Department has prepared a Negative Declaration to satisfy the California Environmental Quality Act (CEQA) requirements.

II. GENERAL PERMIT CONDITIONS

II.A. Effect of Permit

II.A.1. The issuance of this permit by the California Environmental Protection Agency, Department of Toxic Substances Control (Department) does not release the Permittee from any liability or duty imposed by federal or state statutes and regulations or local ordinances, except the obligation to obtain this permit. In particular, unless otherwise specifically provided in this permit, the Permittee shall comply with the provisions of the Health and Safety Code (HSC), division 20, chapter 6.5 and the California Code of Regulations (Cal. Code Regs.), title 22, division 4.5.

II.A.2. Issuance of this permit by the Department does not prevent the Department from adopting or amending regulations, issuing administrative orders, or obtaining judicial orders which impose requirements which are in addition to or more stringent than those in existence at the time this permit was issued, and does not prevent the enforcement of these requirements against the Permittee. The Permittee shall comply with any such additional or more stringent requirements in addition to the requirements and conditions specified in the permit. Where appropriate, this permit is also subject to HSC Sections 25159.6 and 25159.7 relating to the incorporation and implementation of Federal regulations in the absence of equivalent State regulations.

II.B.3. This permit does not convey any property rights of any sort, or any exclusive privilege, nor does it authorize any injury to persons or property or any invasion of other private rights.

II.B. Requirement to Submit Information

All information, reports, submittal, or notices required by this permit shall be submitted to the Department of Toxic Substances Control, Facility Permitting Branch Chief in Region 2.

II.C. Consent to Entry by Department Representatives

The Permittee, by accepting this permit, consents to entry by any authorized representative of the Department or of the local health officer at any reasonable hour of the day in order to carry out the purposes of the Hazardous Waste Control Law, Health and Safety Code section 25100 et seq., including but not limited to the activities listed in HSC section 25185 and title 22, Cal. Code Regs., section 66270.30(i).

II.D. Specific Conditions

II.D.1. The Permittee shall comply with the general facility standards contained in title 22, Cal. Code Regs., division 4.5, chapter 14, article 2.

II.D.2. The Permittee shall comply with preparedness and prevention requirements contained in tittle, Cal. Code Regs., division 4.5, chapter 14, article 3.

II.D.3. The Permittee shall comply with the contingency plan and emergency procedure requirements contained in title 22, Cal. Code Regs., division 4.5, chapter 14, article 4.

II.D.4. The Permittee shall comply with the manifest system, recordkeeping and reporting requirements contained in title 22, Cal. Code Regs., division 4.5, chapter 14, article 5 and Section 66270.30.

II.D.5. The Permittee shall comply with the closure and, if applicable, post-closure requirements contained in title 22, Cal code Regs., division 4.5, chapter 14, article 7.

II.E. Land Disposal Restrictions

II.E.1 The Permittee shall comply with applicable provisions of the land disposal restrictions as found in title 22, Cal Code Regs., division 4.5, chapter 18.

II.E.2 The Permittee shall retain on-site, until closure of the facility, a copy of all notices, certifications, demonstrations, waste analyses data, and other documentation related to the management of all wastes (for on-site or off-site treatment, storage or disposal) subject to land disposal restrictions in accordance with title 22, Cal Code Regs., sections 66264.73(b)(12), 66264.73(b)(16) and 66268.7.

II.E.3 The Permittee shall retain on-site, a current waste analysis plan describing how and when wastes or treatment residues will be tested to comply with the land disposal restriction regulations.

II.F. Air Emission Standards

The Permittee shall comply with all applicable air emission standards pursuant to title 22, Cal Code Regs., sections 66264.1050 through 66245.1065 for equipment leaks.

II.G. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a permit modification, revocation and reissuance, or termination or a notification of anticipated noncompliance or planned changes (except as provided in title 22, Cal Code Regs., section 66270.42(a)), does not stay any permit condition. Except as provided in title 22, Cal. Code Regs. section 66270.42(a), a new facility permit condition or a modification of an existing facility permit condition shall become effective on the date specified in the Department's written notice of approval of the permit modification, pursuant to title 22, Cal Code Regs. sections 66270.42 and/or 66271.14.

II.H. Need to Halt or Reduce Activity

It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

II.I. Severability

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

II.J. Permit Expiration

In accordance with title 22, Cal. Code Reds., section 66270.51, this permit and all conditions therein will remain in effect beyond the permit expiration or termination date, until the effective date of a new permit, if the Permittee has submitted a timely and complete application (both Part A and Part B) for a new permit and, through no fault of the Permittee, the Department has not issued a new permit. In accordance with title 22, Cal. Code Regs., section 66270.10(h), a timely and complete application for a new permit shall be submitted at least 180 days before this permit expires, unless permission for a later date is granted in writing by the Department.

II.K. 24-Hour Reporting

The Permittee shall report to the Department any incidents of noncompliance with the conditions of this permit and any of the provisions of title 22, Cal. Code Regs., division 4.5 or HSC, division 20, chapter 6.5, which may endanger health or the environment, pursuant to the reporting requirements in title 22, Cal. Code Regs., section 66270.30(l)(6).

II.L. Notice of Planned Physical Changes and Certification of Construction

The Permittee shall give notice to the Department as soon as possible, and in any event, at least 30 days in advance of, any planned physical alterations or additions to the permitted facility. In addition, prior to commencement of the treatment, storage, or transfer of hazardous wastes at a new facility or modified portion of an existing facility, the Permittee shall comply with the requirements contained in title 22, Cal. Code Regs., section 66270.30(l)(2).

II.M. Operation at Night

When the facility is operated during hours of darkness, the Permittee shall provide sufficient lighting to ensure safe, effective management of hazardous wastes.

II.N. Part B Application (Operation Plan) of the Hazardous Waste Facility Permit Application

II.N.1. By the issuance of this permit, the Part B Permit Application dated January 14, 1986, as modified by subsequent amendments, October 1, 1991, November 12, 1992 and April 9, 1993, is hereby approved. This Part B Permit Application and any subsequent revisions thereto, subject to the permit modification requirements contained in title 22, Cal. Code Regs., sections 66270.41 and 66270.42, are by this reference made part of this permit. Specific sections of this Part B Permit Application are referenced elsewhere in this permit.

II.N.2. The Permittee shall operate and maintain the facility in accordance with the Part B Permit Application.

II.N.3. In the event of any conflict between this permit and the Part B Permit Application referenced herein, the most stringent provisions shall control.

II.N.4. The Part B Permit Application and this permit shall be maintained at the facility and place of business at all times until closure is completed.

II.O. General Responsibilities of Permittee

II.O.1. Compliance

The Permittee shall comply with all conditions of this permit in accordance with title 22, Cal Code Regs., sections 66270.14(b)(19), 66270.30 and 66270.32. The Permittee shall comply with all laws, regulations, permits, zoning conditions, and all other requirements established by federal, state, and local agencies.

II.O.2. Transfer of the Permit

This permit may be transferred to a new Permittee only if it is modified or revoked and reissued pursuant to title 22, Cal Code Regs., section 66270.40. The Permittee shall notify the Facility Permitting Branch Chief in Region 2, in writing, of a proposed change in ownership of this facility no later than 90 days prior to the proposed date of transfer. A copy of the notification, required under title 22, Cal. Code Regs., section 66264.12(c), informing the new Permittee of the requirements of this permit and title 22, Cal Code Regs., division 4.5, chapters 14 and 20, shall be submitted to the Department prior to the transfer.

II.O.3. **Operation and Maintenance**

II.O.3.a. The Permittee shall at all times maintain and operate to minimize the possibility of a fire, explosion, or any unplanned release of hazardous waste or hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment.

II.O.3.b. The Permittee shall maintain all equipment, pipes, and lines used to handle, transfer, pump, or store hazardous wastes in a manner that prevents the leaking and spilling of hazardous wastes.

II.O.3.c. The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control in accordance with title 22, Cal. Code Regs., section 66270.30(e).

II.O.4. **Submittal of Requested Information**

The Permittee shall furnish to the Department, within the time specified by the Department in its request, any relevant information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Department, upon request, copies of records required to be kept by this permit.

II.O.5. **Hazardous Waste List**

The Permittee shall maintain at the facility, a current list of hazardous wastes streams that are handled by the facility. The Permittee shall, as necessary, update the hazardous waste list presented in the approved Part B Permit Application dated April 9, 1993, Section V and Tab V.A., in accordance with the permit modification requirements contained in title 22, Cal Code Regs., section 66270.42 (a), (b) or (c). Any additions to the list must be approved by the Department, in accordance with the requirements of title 22, Cal. Code Regs., sections 66270.41 and/or 66270.42, prior to their inclusion.

II.O.6. <u>Anticipated Noncompliance</u>

The Permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements, in accordance with title 22, Cal Code Regs., section 66270.30(l)(2).

II.O.7. <u>Noncompliance</u>

In the event of noncompliance with the permit, the Permittee shall take all reasonable steps to minimize or correct releases to the environment, and shall carry out all measures as are reasonable to prevent and correct adverse impacts on human health or the environment. The Permittee shall report to the Department and to the California Office of Emergency Services (800) 852-7550 any circumstances that may endanger public health or the environment immediately upon becoming aware of the incident.

II.O.8. <u>Incomplete and/or Incorrect Information</u>

Where the Permittee becomes aware that any relevant fact was not included in a permit application, or incorrect information was submitted in a permit application or in any report to the Department, the Permittee shall promptly correct the error or omission by submitting the correct information to the Department.

II.P. <u>Signatory Requirement</u>

II.P.1. The Permittee shall comply with the signatory requirements in title 22, Cal. Code Regs., section 66270.11, for all applications, reports or information submitted to the Department.

II.P.2. The Permittee shall provide documentation of an agreement for operation of the facility between the property owner and the facility owner, if different from the property owner.

II.Q. Waste Minimization Certification

The Permittee shall certify annually, by March 1 for the previous year ending December 31, that:

II.Q.1. The facility has a program in place to reduce the volume and toxicity of all hazardous wastes which are generated by the facility operations and all wastes for which the facility assumes generator status to the degree, determined by the Permittee, to be economically practicable.

II.Q.2. The method of storage, treatment, or disposal is the only practicable method or combination of methods currently available to the facility which minimizes the present and future threat to human health and the environment.

The Permittee shall make this certification, in accordance with title 22, Cal Code Regs., section 66270.11. The Permittee shall submit the certification to the Department's Facility Permitting Branch Chief in Region 2 and shall record and maintain on-site such certification in the facility Operating Record.

II.R. Waste Minimization Conditions

II.R.1. The Permittee shall comply with the Hazardous Waste Source Reduction and Management Review Act requirements that are specified in the HSC, sections 25244.19, 25244.20 and 25244.21, and any subsequent applicable statutes or regulations promulgated thereunder.

II.R.2. The Permittee shall submit a copy of all reviews, plans, plan summaries, reports and report summaries required by Section II.S.1. above, to the Department's Facility Permitting Branch Chief in Region 2 on or before March 1, 1994, and by March 1, every four years thereafter.

The Department's Facility Permitting Branch Chief in Region 2 may require the Permittee to submit a more detailed status report explaining any deviation from, or changes to, the waste minimization plan.

II.S. Recycling

The Permittee shall comply with the requirements for recyclable hazardous wastes specified in Title 22, Cal. Code of Regs. and Division 4.5, Chapter 16.

III. SPECIAL CONDITIONS

III.A. Prohibition of Disposal

Pursuant to HSC Section 25203, hazardous wastes shall not be disposed of at the facility.

III.B. Identification of Permitted and Prohibited Waste

1. Permitted Wastes

1.a. Storage in Containers

i. Storage in Containers at Building 433 - The Permittee shall not store hazardous waste at Building 433 except as authorized by the Department. The Permittee may store hazardous waste in containers at Building 433 as listed and described in Sections V and VI of the approved Operation Plan (Part B Application, April 9, 1993). The Permittee may store hazardous wastes in 2, 5, 9, 30, 55 and 85-gallon drums subject to the conditions of this permit, the requirements of title 22, Cal. Code Regs., division 4.5, chapter 14, and as specified below:

Storage Area at Building 433	Dimension in Feet (L x W)	Maximum Volume in Gallons per Area [a]	Maximum Number of 55 Gallon Drums Per Area (2 stacking height) [b]
Area 8	11 x 27.17	3,520	64
Area 7	12 x 11.5	1,760	32
Area 5	12 x 22.5	2,640	48
Area 1	12 x 13.5	1,760	32
Area 3	12 x 12.67	1,760	32
Area 4	11 x 12	1,760	32
Area 6	11 x 7.5	880	16

Note: Area 2 (11 ft x 13.5 ft) is the office in the Building 433.

(a) The drum equivalency applies to both the total quantities stored in Building 433 and to each individual area. This maximum volume shall govern, regardless of the size of containers used.

(b) Drums of other sizes are allowed to be used in each area. A sign must be posted to identify the group of hazardous waste being stored in each area (e.g. Area 3, Organics).

ii. **Storage of Treated Wood Waste in Steel Roll-Off Bins near Building A-3 -** The Permittee is allowed to store treated wood waste in roll-off bins located near Building A-3. Roll-off bins are stored outdoor on concrete pad.

Solid Waste Container	Description of Hazardous waste	Hazardous Waste Code California/USEPA	Dimension of each bin (L x W x H) in Feet	Capacity of each bin in Cubic Yards/Total capacity
Roll-Off Bin #1, 2, 3, 4, 5, & 6	Treated Wood Waste	331 F027 D004 D008	22 x 6.58 x 8	40/240

Note: Treated wood waste could contain any of the following chemicals: Creosote, Pentachlorophenol, Copper Arsenic, Lead Paint.

iii. **Storage and Treatment of Photochemical/Photoprocessing Wastes -** The Permittee is allowed to store and treat photochemical/photoprocessing wastes in the unit/container located at Buildings IA-18, IA-22 and IA-58.

Storage & Treatment Unit and Location	Description of Hazardous Waste	Hazardous Waste Code California	Maximum Holding Capacity of each Unit in Gallons
Silver Recovery Unit at Building IA-18	Photochemical/ Photoprocessing Waste	541	9.4
Silver Recovery Unit at Building IA-22	Photochemical/ Photoprocessing Waste	541	4.2
Silver Recovery Unit at Building IA-58	Photochemical/ Photoprocessing Waste	541	7.4

iv. Storage of Crushed Fluorescent Tubes at Building IA-46 - The Permittee is allowed to crush and store fluorescent tubes at Building IA-46 as described in Sections V and VI of the approved Part B Application. The Permittee shall observe proper operational procedures, health and safety of personnel and comply with all applicable air emission standards as required by title 22, Cal. Code Regs., sections 66264.1050 through 66264.1065.

Description of Hazardous Waste	Hazardous Waste Code California	Maximum Storage Capacity in Gallons
Crushed Fluorescent Tubes	181	55 gallon

v. The Permittee shall not store hazardous wastes in excess of the maximum inventory specified below at any given time:

(1) a maximum of 256 fifty five-gallon drums or its equivalent 14,080 gallons hazardous waste in Building 433; the maximum inventory is based on double stacking of containers;

(2) a maximum of one 55-gallon drum of crushed fluorescent tubes at Building IA-46;

(3) a maximum of 240 cubic yards of treated wood waste in steel roll-off bins located near Building A-3;

(4) a maximum holding capacity of 9.4 gallons of photochemical/photoprocessing waste at Building IA-18;

(5) a maximum holding capacity of 4.2 gallons of photochemical/photoprocessing waste at Building IA-22; and

(6) a maximum holding capacity of 7.4 gallons of photochemical/photoprocessing waste at Building IA-58.

vi. The Permittee shall maintain a sign at all times in a conspicuous location at the entrance of each storage area as described in Section VII of the Operation Plan.

vii. The Permittee shall store wastes in DOT-approved containers as described in Section VI of the Operation Plan.

1.b. **Duration of Storage**

The Permittee is authorized to store hazardous wastes up to a maximum of two (2) calendar years from the date of receipt at Building 433. Duration of storage of waste treated wood near Building A-3 shall not exceed five (5) calendar years.

1.c. **Acceptance of Hazardous Waste**

Upon receipt at Building 433 and Building A-3, the Permittee shall mark the date of acceptance and maintain original generator labels on all containers of hazardous waste until such time as the waste is treated or transferred off-site.

1.d. **Treatment of Hazardous Waste**

i. This permit authorizes the Permittee's licensed contractor to puncture and crush aerosol containers at Building 433 to decrease volume provided that proper operational procedures, health and safety of personnel and air emission standards as required by 40 CFR 264.1052 through 264.1062 are complied with.

ii. The Permittee is authorized to perform acid neutralization of simple base (addition of hydrochloric acid to sodium hydroxide waste) at Building 433 provided that proper operational procedures are followed as described in Sections VII and VIII of the Operation Plan.

iii. The Permittee is allowed to consolidate wastes at Building 433 provided the wastes being consolidated are of the same kind and proper operational procedures are followed in terms of compatibility, spillage and safety of personnel.

iv. The Permittee is allowed to add absorbent material (kitty litter) to drums containing solid waste to fill void space prior to transfer to a Class I permitted facility.

v. The Permittee is allowed to crush and store fluorescent tubes in a 55-gallon drum at Building IA-46 as described in Section III.B.1.a.iv. above.

vi. The Permittee is allowed to recover silver from photo fixer solution using silver recovery units located at Buildings IA-18, IA-22 and IA-58.

B.2. Prohibited Wastes

i. The Permittee is prohibited from storing Otto Fuel waste at the facility. The Permittee is only allowed to transfer Otto Fuel waste from the ship to the registered hauler which takes the Otto Fuel waste to a permitted disposal facility.

ii. The Permittee shall not store radioactive or explosive waste. Except as otherwise provided by HSC, division 20, chapter 6.5 and title 22, Cal. Code Regs., division 4.5, any hazardous waste not listed in Section V and Tab V.A. of Part B application dated April 9, 1993 shall not be handled at the facility.

III.C. Other Conditions

Within 24 hours of each Richter magnitude earthquake of 4.0 or greater, as reported by the University of California at Berkeley or the United States Geological Survey (whichever is greater), within 100 miles of the facility, the Permittee shall inspect all hazardous waste units to determine waste releases and suitability of units to continue in service in compliance with conditions of this permit and title 22, Cal. Code Regs.. Within 15 days after any such earthquake, the Permittee shall notify the Department in writing. The notification shall include, as applicable:

1. Description, to include photographs, of nature and extent of damage.

2. Statement signed by a certified engineer familiar with hazardous waste management as to suitability of each hazardous waste unit to continue in operation in compliance with this permit and title 22, Cal. Code Regs.

3. If it has been determined that any hazardous waste unit is unfit to continue in operation, the date when waste was removed from that unit and the disposition of that waste.

4. Description of all initial repairs made.

5. Schedule of actions to be taken to make subsequent repairs.

IV. COMPLIANCE SCHEDULE

IV.A. Reporting

The Permittee shall comply with the compliance schedule requirements of title 22, Cal. Code Regs., section 66270.30(l)(5).

IV.B. Summary of Compliance Schedule

The Permittee shall comply with the following:

Task	Due Date
Waste Minimization Certification	Annually by March 1
Copy of Waste Minimization Plans and Related documents	March 1, 1994 and every four years thereafter
Other Notification and Reporting Requirements	As required in this Permit and regulations in title 22, Cal. Code Regs., division 4.5 and Health and Safety Code, division 20, chapter 20, chapter 6.5.

IV.C. Option to Cease Operation

If the Permittee decides to cease conducting regulated activities rather than continue to operate and meet permit requirements, the Permittee shall comply with the applicable requirements of title 22, Cal. Code Regs., section 66270.33(b).

V. CORRECTIVE ACTION

V.A. SUMMARY OF RFA ACTIVITIES

V.A.1. A RCRA Facility Assessment (RFA) was conducted and a report summarizing the findings, dated June, 1992, was prepared by the California Environmental Protection Agency, Department of Toxic Substances Control. The RFA identified 49 Solid Waste Management Units (SWMUs) at the facility. Twenty four (24) SWMUs had potential releases of hazardous waste to the environment as listed below.

Table V.A.1. SWMUs required to have a RCRA Facility Investigation (RFI) or Equivalent Investigation

SWMUs #	Location	Name or Description of Location
INLAND AREA 1	Building IA-6	Boiler House
2	Building IA-7	Shallow Burn Pit South of the Firehouse
5	Building IA-12	Locomotive Repair Shop
7	Building IA-16	Public Works Shop and Auto Vehicle Maintenance Division
8	Building IA-20	Chemical Laboratory
12	Building IA-24	Forklift Maintenance Building
13	Building IA-25	Missile Component Maintenance
14	Building IA-27	Car Blocking Shop
15	Building IA-41	Paint Storage
16	Building IA-46	Public Works Maintenance Storage
17	Building IA-50	Rail/Truck Transfer Depot
18	Building IA-51	Auto Vehicle Maintenance Facility
20	Building IA-55	Ordnance Operations Building
22	Building 81	Ordnance Maintenance and Test Building

Table V.A.1. **SWMUs required to have a RCRA Facility Investigation (RFI) or Equivalent Investigation**

SWMUs #	Location	Name or Description of Location
INLAND AREA		
23	Building 87	Storage Building
24	Building 93	Guided Missile Division
25	Building 97	Ordnance Assembly Building
26	Building 178	Navy Exchange Service Station
30	UNOCAL CORPORATION	Oil Pipeline Spill Site
33	Site 6LC98	Underground Storage Tank (Abandoned Tank #17)
TIDAL AREA		
37	Building A-29	Dunnage, Salvage Yard
40	Building 174	Electric Substation
44	Building 350	Ordnance Maintenance Building
46	Site E-111	Underground Storage Tank (Heating Plant)

V.A.2. A Federal Facility Site Remediation Agreement (FFSRA) was entered into between the State of California and the U.S. Department of the Navy, Concord NWS to achieve the Parties' primary goal of environmental restoration. The State of California is represented by DTSC as lead agency for the Inland Area Sites and the RWQCB as the lead agency for the Tidal Area Sites. The Navy agrees to seek sufficient funding through the DOD budgetary proposals to fulfill its obligations under this agreement. The Parties intend to integrate into this comprehensive Agreement the Navy's CERCLA response obligations with the Navy's (a) RCRA corrective action obligations to the extent possible, (b) State corrective/remedial action obligations, and (c) obligations under all Orders and other statutory requirements of RWQCB. The FFSRA provides that remediation of releases under this

Agreement shall obviate the need for further corrective action under RCRA. The specific purposes of the FFSRA are to:

a. Establish requirements for the performance of pre-remedial work and Remedial Investigation (RI) to determine fully the nature and extent of the threat to the public health or the environment caused by the release and threatened release of hazardous substances at the site and to establish requirements for the performance of a Feasibility Study (FS) for the site to identify, evaluate, and select alternatives for the appropriate remedial action(s) to prevent, mitigate, or abate the release or threatened release of hazardous substances in accordance with applicable state and federal law;

b. Identify the nature, objective, and schedule of response actions to be taken at the site mandated by applicable state and federal law;

c. Implement the selected remedial action(s) in accordance with applicable state and federal law;

d. Assure compliance with applicable state and federal hazardous waste and water quality laws and regulations for matters covered herein;

e. Expedite the cleanup process to the extent consistent with protection of human health and the environment;

f. Provide for State oversight of and participation in the initiation, development, selection and implementation of response actions, including the review of all applicable data as it becomes available and the development of studies, reports, and action plans and, preserve the State's right to enforcement pursuant to applicable state and federal law; and

g. Provide for operation and maintenance of any remedial action selected and implemented pursuant to this agreement.

V.A.3. The Permittee has determined that the corrective action work required to be performed on SWMUs listed in Table V.A.1. above will be funded by the Defense Environmental Restoration Account (DERA) to the extent permitted by applicable regulations and in accordance with a standardized Department of Defense prioritization process which allocates yearly DERA appropriations in a manner which maximizes the protection of human health and the environment, or by other funds subject to the availability of those appropriated funds. The Department concurs with such funding arrangements for these specific units. The Permittee shall submit to the Department, as specified in Permit Condition V.C.2., within one hyndred twenty (120) days of the effective date of this permit, its schedule for beginning and completing a RCRA Facility Investigation or equivalent investigation under the FFSRA. The Department's Site Mitigation Branch shall act the lead for the Inland Area SWMUs; the San Francisco Bay Area Regional Water Quality Control Board shall act as the lead for the Tidal Area SWMUs. The Permittee shall incorporate the RFI progress discussion in the monthly or bimonthly meeting's agenda as required under the FFSRA.

V.A.4. Should the Permittee fail to submit such a schedule or to meet any of the deadlines in that schedule, the Permittee shall proceed with actions delineated in Permit Condition V.E. below.

V.B. DEFINITIONS

For purposes of this Corrective Action Schedule of Compliance, the definitions of the terms "Facility", "Release", "Solid waste management unit", "Hazardous waste",and "Hazardous constituent" shall be as defined in title 22, Cal. Code Regs. section 66260.10

"Branch Chief" means the Branch Chief of the California Environmental Protection Agency, Department of Toxic Substances Control, Region 2, Facility Permitting Branch or his designee or authorized representative.

All references herein to Unit Numbers are found in RCRA Facility Assessment, Concord Naval Weapons Station, Code 092031, EPA ID # CA 7170024528 , Prepared by the California Environmental Protection Agency, Department of Toxic Substances Control, Region 2, Berkeley, California, June, 1992.

V.C. STANDARD CONDITIONS

1. Title 22, Cal. Code Regs., section 66264.100 requires that permits issued after July 1, 1991, address corrective action of all releases of hazardous wastes including hazardous constituents from any solid waste management unit (SWMU) at the facility, regardless of when the waste was placed in the unit.

2. Failure to submit the information required in this Corrective Action Schedule of Compliance, or falsification of any submitted information, is grounds for termination of this Permit (title 22, Cal. Code Regs. section 66270.43). The Permittee shall ensure that all plans, reports, notifications, and other submissions to the Branch Chief required in this Corrective Action Schedule of Compliance are signed and certified in accordance with title 22, Cal. Code Regs., section 66270.11. Two (2) copies of these plans, reports, notifications or other submissions shall be submitted to the Branch Chief and sent by certified mail or hand delivered to:

   Branch Chief
   Facility Permitting Branch
   Department of Toxic Substances Control
   Region 2
   700 Heinz Avenue, Suite 200
   Berkeley, CA 94710

3. All plans and schedules required by the conditions of this Corrective Action Schedule of Compliance are, upon approval of the Branch Chief, incorporated into this Schedule of Compliance by reference and become an enforceable part of this Permit. Any noncompliance with such approved plans and schedules shall be deemed noncompliance with this Permit. Extensions of the due dates for submittal may be granted by the Branch Chief in accordance with the permit modification processes under title 22, Cal. Code Regs., section 66270.41.

4. If the Branch Chief determines that further actions beyond those provided in this Corrective Action Schedule of Compliance, or changes to that which is stated herein, are warranted, the Branch Chief shall modify the Schedule of Compliance either according to procedures in Permit Condition V.Q. of this Permit, or according to the permit modification processes under title 22, Cal. Code Regs., section 66270.41.

5. All raw data, such as laboratory reports, drilling logs, bench-scale or pilot-scale data, and other supporting information gathered or generated during activities undertaken pursuant to this Corrective Action Schedule of Compliance shall be maintained at the facility during the term of this Permit, including any reissued Permits.

V.D. REPORTING REQUIREMENTS

1. The Permittee shall submit to the Branch Chief signed quarterly progress reports of all activities conducted pursuant to the provisions of this Corrective Action Schedule of Compliance beginning no later than ninety (90) calendar days after the Permittee is first required to begin implementation of any requirement herein. These reports shall contain:

    a. A description of the work completed;

    b. Summaries of all findings, including summaries of laboratory data;

    c. Summaries of all problems or potential problems encountered during the reporting period and actions taken to rectify problems; and

    d. Projected work for the next reporting period.

2. Copies of other reports (e.g., daily reports, inspection reports), drilling logs and laboratory data shall be made available to the Branch Chief upon request.

3. As specified under Permit Condition V.C.4., the Branch Chief may require the Permittee to conduct new or more extensive assessments, investigations, or studies, as needed, based on information provided in these progress reports or other supporting information. If new or more extensive investigations or studies are required, the time frame for compliance may be extended, if requested in writing.

4. Reports submitted by the Permittee to the Branch Chief pursuant to Permit Condition V.D. shall include reports submitted to the Department's Site Mitigation Branch and the Regional Water Quality Control Board under FFSRA.

V.E. CORRECTIVE ACTION REQUIRED FOR EXISTING SWMUs

1. Should the Permittee fail to submit a schedule as required in Section V.A.3. of this permit, or fail to meet a deadline in that schedule, or if additional units not included Table V.A.1. above are identified, a RCRA Facility Investigation (RFI) as delineated in Permit Condition V.H. below and subsequent corrective action work shall be performed for all such sites or units.

V.F. NOTIFICATION REQUIREMENTS FOR AND ASSESSMENT OF NEWLY-IDENTIFIED SOLID WASTE MANAGEMENT UNIT(S)

1. The Permittee shall notify the Branch Chief in writing of any newly-identified SWMU(s), not specifically identified during the RFA and listed in Section A, discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means, no later than fifteen (15) calendar days after discovery.

2. After such notification, the Branch Chief may request, in writing, that the Permittee prepare a Solid Waste Management Unit (SWMU) Assessment Plan and a proposed schedule of implementation and completion of the Plan for any additional SWMU(s) discovered subsequent to the issuance of this Permit.

3. Within fifteen (15) calendar days after receipt of the Branch Chief's request for a SWMU Assessment Plan, the Permittee shall prepare a SWMU Assessment Plan for determining past and present operations at the unit, as well as any sampling and analysis of ground water, land surface and subsurface strata, surface water or air, as necessary to determine whether a release of hazardous waste including hazardous constituents from such unit(s) has occurred, is likely to have occurred, or is likely to occur. The SWMU Assessment Plan must demonstrate that the sampling and analysis program, if applicable, is capable of yielding representative samples and must include parameters sufficient to identify migration of hazardous waste including hazardous constituents from the newly discovered SWMU(s) to the environment.

4. After the Permittee submits the SWMU Assessment Plan, the Branch Chief shall either approve or disapprove the Plan in writing.

   If the Branch Chief approves the Plan, the Permittee shall begin to implement the Plan within fifteen (15) calendar days of receiving such written notification.

If the Branch Chief disapproves the Plan, the Branch Chief shall either (1) notify the Permittee in writing of the Plan's deficiencies and specify a due date for submittal of a revised Plan, or (2) revise the Plan and notify the Permittee of the revisions. This Branch Chief-revised Plan becomes the approved SWMU Assessment Plan. The Permittee shall implement the Plan within fifteen (15) calendar days of receiving written approval.

5. The Permittee shall submit a SWMU Assessment Report to the Branch Chief no later than fifteen (15) calendar days from completion of the work specified in the approved SWMU Assessment Plan. The SWMU Assessment Report shall describe all results obtained from the implementation of the approved SWMU Assessment Plan. At a minimum, the Report shall provide the following information for each newly identified SWMU:

   a. The location of the newly-identified SWMU in relation to other SWMUs;

   b. The type and function of the unit;

   c. The general dimensions, capacities, and structural description of the unit (supply any available drawings);

   d. The period during which the unit was operated;

   e. The specifics on all wastes that have been or are being managed at the SWMU, to the extent available; and

   f. The results of any sampling and analysis required for the purpose of determining whether releases of hazardous wastes including hazardous constituents have occurred, are occurring, or are likely to occur from the unit.

6. Based on the results of this Report, the Branch Chief shall determine the need for further investigations at specific unit(s) covered in the SWMU Assessment. If the Branch Chief determines that such investigations are needed, the Branch Chief may require the Permittee to prepare a plan for such investigations. This plan will be reviewed for approval as part of the RCRA Facility Investigation (RFI) Workplan under Permit Condition V.H.1.

V.G. NOTIFICATION REQUIREMENTS FOR NEWLY-DISCOVERED RELEASES AT SWMUs

The Permittee shall notify the Branch Chief, in writing, of any release(s) of hazardous waste including hazardous constituents discovered during the course of ground-water monitoring, field investigation, environmental auditing, or other activities undertaken after the commencement of the RFI, no later than fifteen (15) calendar days after discovery. Such newly-discovered releases may be from newly-identified units, from units for which, based on the findings of the RFA, the Branch Chief had previously determined that no further investigation was necessary, or from units investigated as part of the RFI. The Branch Chief may require further investigation of the newly-identified release(s). A plan for such investigation will be reviewed for approval as part of the RFI Workplan under Permit Condition V.H.1.

V.H. RCRA FACILITY INVESTIGATION (RFI) WORKPLAN

1. On or before one hundred twenty (120) calendar days after a request by the Branch Chief, the Permittee shall submit a Workplan to the Branch Chief to address those units, releases of hazardous waste including hazardous constituents, and media of concern which require further investigation.

   a. The Workplan shall describe the objectives of the investigation and the overall technical and analytical approach to completing all actions necessary to characterize the nature, direction, rate, movement, and concentration of releases of hazardous waste including hazardous constituents from specific units or groups of units, and their actual or potential receptors. The Workplan shall detail all proposed activities and procedures to be conducted at the facility, the schedule for implementing and completing such investigations, the qualifications of personnel performing or directing the investigations, including contractor personnel, and the overall management of the RFI.

   b. In addition, the Workplan shall discuss sampling and data collection quality assurance and data management procedures, including formats for documenting and tracking data and other results of investigations, and health and safety procedures.

2. After the Permittee submits the Workplan, the Branch Chief will either approve or disapprove the Workplan in writing. If the Branch Chief disapproves the Workplan, the Branch Chief shall either (1) notify the Permittee in writing of the Workplan's deficiencies and specify a due date for submittal of a revised Plan, or (2) revise the Workplan and

notify the Permittee of the revisions. This modified Workplan becomes the approved RFI Workplan.

3. The Branch Chief shall review for approval as part of the RFI Workplan any plans developed pursuant to Permit Condition V.F.6., addressing further investigations of newly-identified SWMUs, or Section V.G., addressing new releases from previously-identified units. The Branch Chief shall modify the Schedule of Compliance either according to procedures in Permit Condition V.Q. or according to the permit modification procedures under title 22, Cal. Code Regs., 66270.41, to incorporate these units and releases into the RFI Workplan.

V.I. RCRA FACILITY INVESTIGATION WORKPLAN IMPLEMENTATION

No later than fifteen (15) calendar days after the Permittee has received written approval from the Branch Chief for the RFI Workplan, the Permittee shall begin implementation of the RCRA Facility Investigation according to the schedules specified in the RFI Workplan. Pursuant to Permit Condition V.C.3., the RFI shall be conducted in accordance with the approved RFI Workplan.

V.J. RCRA FACILITY INVESTIGATION FINAL REPORT AND SUMMARY REPORT

1. Within sixty (60) calendar days after the completion of the RFI, the Permittee shall submit an RFI Final Report and Summary Report. The RFI Report shall describe the procedures, methods, and results of all facility investigations and their releases, including information on the type and extent of contamination at the facility, sources and migration pathways, and actual or potential receptors. The RFI Final Report shall present all information gathered under the approved RFI Workplan. The Final Report must contain adequate information to support further corrective action decisions at the facility. The Summary Report shall describe more briefly the procedures, methods, and results of the RFI.

2. After the Permittee submits the RFI Final Report and Summary Report, the Branch Chief shall either approve or disapprove the Reports in writing.

   If the Branch Chief approves the RFI Report and Summary Report, the Permittee shall mail the approved Summary Report to all individuals on the facility mailing list established pursuant to title 22, Cal. Code

Regs., section 66271.9 within fifteen (15) calendar days of receipt of approval.

If the Branch Chief determines the RFI Final Report and Summary Report do not fully detail the objectives stated under Permit Condition V.H.1., the Branch Chief may disapprove the RFI Final Report and Summary Report. If the Branch Chief disapproves the Reports, the Branch Chief shall notify the Permittee in writing of the Reports' deficiencies and specify a due date for submittal of a revised Final and Summary Report. The Summary Report, once approved, shall be mailed to all individuals on the facility mailing list.

V.K. INTERIM MEASURES

1. If, during the course of any activity initiated under this Corrective Action Schedule of Compliance, the Branch Chief determines that a release or potential release of hazardous waste including hazardous constituents from a SWMU poses a threat to human health and the environment, the Branch Chief may specify interim measures. The Branch Chief shall determine the specific action(s) that must be taken to implement the interim measure, including potential permit modifications and the schedule for implementing the required measures. The Branch Chief shall notify the Permittee in writing of the requirement to perform such interim measures. The Branch Chief shall modify the Corrective Action Schedule of Compliance either according to procedures in Permit condition V.Q., or according to the permit modification procedures under title 22, Cal. Code Regs., section 66270.41, to incorporate such interim measures into the Permit.

2. The following factors may be considered by the Branch Chief in determining the need for interim measures:

   a. Time required to develop and implement a final remedy;

   b. Actual and potential exposure of human and environmental receptors;

   c. Actual and potential contamination of drinking water supplies and sensitive ecosystems;

   d. The potential for further degradation of the medium absent interim measures;

e. Presence of hazardous waste in containers that may pose a threat of release;

f. Presence and concentration of hazardous waste including hazardous constituents in soils that have the potential to migrate to ground water or surface water;

g. Weather conditions that may affect the current levels of contamination;

h. Risks of fire, explosion, or accident; and

i. Other situations that may pose threats to human health and the environment.

V.L. CORRECTIVE MEASURES STUDY PLAN

1. If the Branch Chief determines that the contaminants pose a threat to human health and the environment given site-specific exposure conditions, the Branch Chief may require a Corrective Measures Study (CMS) and shall notify the Permittee in writing. This notice shall identify the hazardous constituent(s) which have exceeded action levels as well as those which have been determined to threaten human health and the environment given site-specific exposure conditions. The notification may also specify remedial alternatives to be evaluated by the Permittee during the CMS.

2. The Permittee shall submit a CMS Plan to the Branch Chief within one hundred twenty (120) calendar days from notification of the requirement to conduct a CMS.

   The CMS Plan shall provide the following information:

   a. A description of the general approach to investigating and evaluating potential remedies;

   b. A definition of the overall objectives of the study;

   c. The specific plans for evaluating remedies to ensure compliance;

   d. The schedules for conducting the study; and

   e. The proposed format for the presentation of information.

3. If the Branch Chief disapproves the CMS Plan, the Branch Chief shall either (1) notify the Permittee in writing of the Plan's deficiencies and specify a due date for submittal of a revised Plan, or (2) revise the Plan and notify the Permittee of the revisions. This modified Plan becomes the approved CMS Plan.

V.M. CORRECTIVE MEASURES STUDY IMPLEMENTATION

No later than fifteen (15) calendar days after the Permittee has received written approval from the Branch Chief for the CMS Plan, the Permittee shall begin to implement the Corrective Measures Study according to the schedules specified in the CMS Plan. Pursuant to Permit Condition V.C.3, the CMS shall be conducted in accordance with the approved Plan.

V.N. CORRECTIVE MEASURES STUDY FINAL REPORT

1. Within sixty (60) calendar days after the completion of the CMS, the Permittee shall submit a CMS Final Report. The CMS Final Report shall summarize the results of the investigations for each remedy studied and of any bench-scale or pilot tests conducted. The CMS Report must include an evaluation of each remedial alternative. The CMS Report shall present all information gathered under the approved CMS Plan. The final report must contain adequate information to support the Branch Chief in the remedy selection decision-making process, described under Permit Condition V.O. of the Corrective Action Schedule of Compliance.

2. If the Branch Chief determines that the CMS Final Report does not fully satisfy the information requirements specified under Permit Condition V.L.2., the Branch Chief may disapprove the CMS Final Report. If the Branch Chief disapproves the Final Report, the Branch Chief shall notify the Permittee in writing of deficiencies in the Report and specify a due date for submittal of a revised Final Report.

3. As specified under Permit Condition V.C.4., based on preliminary results and the final CMS report, the Branch Chief may require the Permittee to evaluate additional remedies or particular elements of one or more proposed remedies.

V.O. REMEDY SELECTION

1. Based on the results of the CMS and any further evaluations of additional remedies under this study, the Branch Chief shall select a remedy from the remedial alternatives evaluated in the CMS that will (1) be protective of human health and the environment; (2) meet the

concentration levels of hazardous constituents in each medium that the remedy must achieve to be protective of human health and the environment; (3) control the source(s) of release(s) so as to reduce or eliminate, to the maximum extent practicable, further releases that might pose a threat to human health and the environment; and (4) meet all applicable waste management requirements.

2. In selecting the remedy which meets the standards for remedies established under Permit Condition V.O.1., the Branch Chief shall consider the following evaluation factors, as appropriate:

   a. Long-term reliability and effectiveness. Any potential remedy(s) may be assessed for the long-term reliability and effectiveness it affords, along with the degree of certainty that the remedy will prove successful. Factors that shall be considered in this evaluation include:

      i. Magnitude of residual risks in terms of amounts and concentrations of waste remaining following implementation of a remedy, considering the persistence, toxicity, mobility and propensity to bioaccumulate of such hazardous wastes including hazardous constituents;

      ii. The type and degree of long-term management required, including monitoring and operation and maintenance;

      iii. Potential for exposure of humans and environmental receptors to remaining wastes, considering the potential threat to human health and the environment associated with excavation, transportation, redisposal or containment;

      iv. Long-term reliability of the engineering and institutional controls, including uncertainties associated with land disposal of untreated wastes and residuals; and

      v. Potential need for replacement of the remedy.

   b. Reduction of toxicity, mobility, and volume. A potential remedy(s) may be assessed as to the degree to which it employs treatment that reduces toxicity, mobility or volume of hazardous wastes including hazardous constituents. Factors that shall be considered in such assessments include:

i. The treatment processes the remedy(s) employs and materials it would treat;

ii. The amount of hazardous wastes including hazardous constituents that would be destroyed or treated;

iii. The degree to which the treatment is irreversible; and

iv. The residuals that will remain following treatment, considering the persistence, toxicity, mobility and propensity to bioaccumulate of such hazardous wastes including hazardous constituents.

c. The short-term effectiveness of a potential remedy(s) may be assessed considering the following:

i. Magnitude of reduction of existing risks;

ii. Short-term risks that might be posed to the community, workers, or the environment during implementation of such a remedy, including potential threats to human health and the environment associated with excavation, transportation, and redisposal or containment; and

iii. Time until full protection is achieved.

d. Implementability. The ease or difficulty of implementing a potential remedy(s) may be assessed by considering the following types of factors:

i. Degree of difficulty associated with constructing the technology;

ii. Expected operational reliability of the technologies;

iii Need to coordinate with and obtain necessary approvals and permits from other agencies;

iv. Availability of necessary equipment and specialists; and

v. Available capacity and location of needed treatment, storage and disposal services.

e. Cost. The types of costs that may be assessed include the following:

i. Capital costs;

ii. Operation and maintenance costs;

iii Net present value of capital and operation and maintenance costs; and

iv. Potential future remedial action costs.

V.P. PERMIT MODIFICATION FOR REMEDY

1. Based on information the Permittee submits in the RFI Final and Summary Reports, the CMS Final Report, and other information, the Branch Chief will select a remedy and initiate a major permit modification to this Permit.

The modification shall specify the selected remedy and include, at a minimum, the following:

a. Description of all technical features of the remedy that are necessary for achieving the standards for remedies established under Permit Condition V.O.1., including length of time for which compliance must be demonstrated at specified points of compliance;

b. All concentration levels of hazardous constituents in each medium that the remedy must achieve to be protective of human health and the environment;

c. All requirements for achieving compliance with these concentration levels;

d. All requirements for complying with the standards for management of wastes;

e. Requirements for removal, decontamination, closure, or post-closure of units, equipment, devices or structures that will be used to implement the remedy;

f. A schedule for initiating and completing all major technical features and milestones of the remedy; and

g. Requirements for submission of reports and other information.

2. Within one hundred and twenty (120) calendar days after this Permit has been modified, the Permittee shall demonstrate financial assurance for completing the approved remedy.

V.Q. MODIFICATION OF THE CORRECTIVE ACTION SCHEDULE OF COMPLIANCE

1. If at any time the Branch Chief determines that modification of the Corrective Action Schedule of Compliance is necessary, he or she may initiate a modification to the Schedule of Compliance according to the procedures of this Section. If the Branch Chief initiates a modification, he or she shall:

   a. Notify the Permittee in writing of the proposed modification and the date by which comments on the proposed modification must be received; and

   b. Publish a notice of the proposed modification in a locally distributed newspaper, mail a notice to all persons on the facility mailing list maintained according to 40 Code of Federal Regs. part 124.10(c)1, and place a notice in the facility's information repository (i.e., a central source of all pertinent documents concerning the remedial action, usually maintained at the facility or some other public place, such as a public library, that is accessible to the public) if one is required.

      i. If the Branch Chief receives no written comment on the proposed modification, the modification shall become effective five (5) calendar days after the close of the comment period.

      ii. If the Branch Chief receives written comment on the proposed modification, the Branch Chief shall make a final determination concerning the modification after the end of the comment period.

   c. Notify the Permittee in writing of the final decision.

      i. If no written comment was received, the Branch Chief shall notify individuals on the facility mailing list in writing that the modification has become effective and shall place a copy of the modified Corrective Action

Schedule of Compliance in the information repository, if a repository is required for the facility.

ii. If written comment was received, the Branch Chief shall provide notice of the final modification decision in a locally distributed newspaper and place a copy of the modified Corrective Action Schedule of Compliance in the information repository, if a repository is required for the facility.

2. Modifications that are initiated and finalized by the Branch Chief according to this procedure shall not be subject to administrative appeal.

3. Modifications to the Corrective Action Schedule of Compliance do not constitute a reissuance of the Permit.

APPENDIX B

STANDARD OPERATING PROCEDURES

(INCLUDED AS VOLUME II)

APPENDIX C

RESPONSES TO AGENCIES COMMENTS

NAVY RESPONSES TO AGENCY COMMENTS ON THE DRAFT PROJECT PLANS FOR THE SOLID WASTE MANAGEMENT UNIT SITE INVESTIGATION NAVAL WEAPONS STATION CONCORD

The following responses address the comments provided by the California Environmental Protection Agency Department of Toxic Substances Control (DTSC) and California Regional Water Quality Control Board (RWQCB), and the U.S. Environmental Protection Agency (EPA). These agencies submitted comments regarding the Naval Weapons Station (WPNSTA) Concord draft solid waste management unit (SWMU) site investigation (SI) field sampling plan (FSP) dated July 28, 1994, quality assurance project plan (QAPjP) dated August 5, 1994, and health and safety plan (HSP) dated July 28, 1994. The EPA comments were received on September 11, 1994. Comments from the DTSC and RWQCB were received on October 31, 1994.

The comments are divided into six groups as follows:

- General and specific comments from the EPA on the draft FSP.
- Specific comments from the RWQCB on the draft FSP.
- Specific comments from the EPA on the draft QAPjP.
- Specific comments from the DTSC on the draft QAPjP.
- Specific comments from the DTSC on the draft HSP.
- General and specific comments on the standard operating procedures (SOP) from the DTSC.

RESPONSES TO THE EPA'S COMMENTS ON THE DRAFT FIELD SAMPLING PLAN

GENERAL COMMENTS

Comment 1: **Although this is a preliminary phase of data gathering, it is important to have appropriate detection limits to support the data quality objectives of this investigation. Where the Contract Required Reporting Limits for some potential contaminants of concern exceed Ambient Water Quality Criteria for human health or aquatic life protection, "non-detect" data, alone, collected from this screening phase of investigation should not be used to screen out these chemicals in future stages of investigation. One strategy may be to utilize non-contract laboratory program (CLP) methods with lower detection limits for soil and water samples where exposure to non-human receptors may be anticipated, such as for those samples to be taken in water courses (e.g., Seal Creek), or where the salinity of the groundwater may suggest a hydraulic connection to brackish surface water (e.g., in the dunnage yard area).**

Response: The use of contract laboratory program (CLP) methods is a practical, cost-effective way to analyze most contaminants of concern during the site investigation (SI) phase of a project. The purpose of a site investigation is to assess whether contamination exists at a site and whether further investigation is necessary. Determining this will be based on a number of factors, only one of which is the nondetection of analytes of concern. Other factors include the evaluation of (1) the site history; (2) chemicals used, stored, or disposed of at the site; (3) degradation products, if any, that may be present; (4) detection or nondetection of analytes; (5) the analytes detected in other media, for example an analyte detected in soil but not in groundwater; (6) other similar types of chemicals (in usage and chemical characteristics) detected at the site; and (7) the toxicity effects of the chemical and the population of sensitive receptors located on or near the site. All these factors will be used to evaluate the potential risk from exposure to specific contaminants. If further investigation is warranted, the non-CLP methods will be considered to evaluate the presence of chemicals once actual site conditions, groundwater quality, and applicable or relevant and applicable requirements (ARAR) are better established.

SPECIFIC COMMENTS

Comment 1: **p. 16, Section 4.2.1: Is the "water hole" referred to in the text the same as the "hole in ground" referred to in Figure 10? What is the source of the water? Could it be part of the water supply system? If flooding occurs periodically, shouldn't action be taken to determine the purpose of this structure and eliminate the problem in the future? If this is an abandoned agricultural well, it will be**

necessary to properly abandon it so that it does not serve as a conduit for contamination to deeper aquifers that it may access.

Response: The "water hole" referred to in the text is the same as the "hole in ground" referred to in Figure 10. For consistency, both will be referred to as "hole in ground."

The source of water is believed to be boiler purge water which leaked from a broken pipe leading to the purge water holding tank. While being operated, the boilers were purged after each shift change. Discussions with public works personnel indicated that leakage may have occurred over an extended period of time. The boilers were taken out of service during 1994, and no more leakage should occur from the broken pipe. WPNSTA Concord was notified of the broken pipe.

Comment 2: **p. 17, Section 4.2.1: What is the proposed cleanup level for the total petroleum hydrocarbons as diesel (TPHd) and how was it determined? How were the lateral and vertical extent of petroleum contamination determined since the boring for monitoring well 5 (MW-5) showed TPHd at 10 feet below ground surface (bgs)? Since the groundwater data show that there is contamination by tetrachloroethylene (TCE), what is the proposed cleanup level for TCE in soils and how was it determined?**

Response: The work plan prepared by Fugro-McClelland (FM) does not provide proposed cleanup levels. The vertical and lateral extent of petroleum contamination was determined based on analytical results. The report states that "hydrocarbon contaminated soil was not detected in soil samples chemically analyzed from DH-1 at depths of 5 and 15 feet or MW-5 at 15 feet, indicating soil contamination in the vicinity of DH-1 and MW-5 is limited." No cleanup levels for TCE for soil or groundwater were provided. The Navy will review and revise FM's work plan to address these and any other issues identified during the review before work commences.

Comment 3: **p. 17, Section 4.2.1: The text states that two of the three borings were converted to monitoring wells (MW-5 and MW-6), yet only one (MW-5) was sampled. What happened to MW-6? If the well was destroyed or otherwise made unusable, it should be properly abandoned.**

Response: Monitoring well MW-6 was previously sampled and will be sampled along with MW-5 as part of the SI field activities. The text will be revised accordingly.

Comment 4: **p. 20, Section 4.2.3: The text states that "no leaks have ever been detected" in the underground storage tanks (UST) under investigation in solid waste management unit (SWMU) 7. While the tanks, themselves, may be "tight", the piping that connects them to the dispenser island may have leaked. Please try to orient the soil borings such that contaminant leaks from the piping would be likely to be detected.**

Response: The soil borings will be oriented so that the piping adjacent to the USTs and dispenser island will be investigated. Figure 12 and 13 will be revised accordingly.

Comment 5: **p. 26, Section 4.2.6: The text states that elevated concentrations of nitrates, potassium, and phosphorus "above North Bay area background soil concentrations" were detected at SWMU 13. From what source or literature reference were the "background" concentrations determined?**

Response: The "background" concentrations were derived from the following U.S. Geological Survey Publication dated 1984: "Element Concentrations in Soils and other Surficial Materials of the Conterminous United States." Professional Paper 1270. The text will be revised to reference this document.

Comment 6: **p. 26, Section 4.2.6: It would be less confusing if the text identified samples taken by the Navy by the same name as is presented in Figure 15.**

Response: All samples will be identified by the same designation in the text, Table 6, and Figure 15.

Comment 7: **p. 35, Section 4.2.14: The text states that the UST located next to Building 87 is used for oil storage, but Figure 22 indicates that the UST is for diesel storage. Please explain the apparent discrepancy.**

Response: The UST located adjacent to building 87 is used for diesel fuel storage. The text will be revised accordingly.

Comment 8: **p. 41, Section 4.2.19: The text states that USTs 350A and 350B each have a capacity of 2,000 gallons, but Figure 27 shows the capacities as 3,000 gallons. Please correct the inconsistency.**

Response: USTs 350A and 350B each have a capacity of 2,000 gallons. The figure will be revised accordingly.

Comment 9: **p. 53, Section 5.2.2: If MW-6 is still functional, it should be sampled as part of the SI, in addition to MW-2 which is approximately 100 feet away. Given the data in the text and that provided in Figure 10, the question of gradient has not yet been firmly established. While it is logical to assume that topography influences the shallow groundwater gradient, the fact that there is a potential water source that may be "day-lighting", in the form of ponded water, in the vicinity of the contamination may make the small-scale, local groundwater gradient somewhat more complicated.**

Response: Monitoring wells MW-2 and MW-6 will be sampled as part of the SI field activities. Based on previous investigations at building IA-6 (Fugro-McClelland 1993), the groundwater gradient is northwest approximately paralleling Kinnie Boulevard. The groundwater gradient will be indicated on Figure 10. The text will be revised to include a discussion on groundwater flow in Section 4.2.1.

The ponded water due to the broken pipe leading from the boiler house was of limited extent and was less than one-half foot deep. This should not influence the local groundwater gradient since groundwater is approximately 15 feet below the ground surface.

Comment 10: **p. 53, Section 5.2.3: Of what material are the boilers constructed? Since boilers are frequently made out of metal, and/or are metal-lined, metals should be considered contaminants of potential concern (COPC). What are the "other chemicals" that may be added to the boiler purge water? Will these be detectable using the proposed list of COPCs? Were phosphate detergents used? While pH might be a good indicator for concern associated with disposal, the buffering capacity of the soils may be sufficient to mask apparent disposal of the purge water using pH as an indicator. What will be used as an indicator of the "other chemicals" in the boiler purge water? Is asbestos a contaminant of concern?**

Response: The boilers are constructed of red brick with either an asbestos or steel interior lining. Piping leading to and from the boilers is insulated with asbestos-containing materials (ACM). Chemicals frequently added to boiler water include sodium hydroxide, sodium carbonate, sodium sulfite, sodium phosphates, and sodium nitrate. Soil samples from soil boring 01-SB01 will also be analyzed for metals. Section 4.2.1 will be revised to reflect this information.

Although ACM is present inside building IA-6, there are no exposure routes for asbestos to get into purge water or soil. Boiler water is contained within the piping and never comes in contact with asbestos. Therefore, asbestos is not a COPC for soil or groundwater.

Comment 11: **p. 54, Section 5.3.1: The text fails to state the depth at which samples will be taken. Will a "surface" sample (0 to 0.5 foot bgs) be taken along the drainage? How was the determination made that the sample depth should be 5 feet bgs? In an environment, such as the drainage channel that leads to Seal Creek, in addition to placement of borings, it would be appropriate to use field decisions about what depth along the core to recover the soil sample, e.g., change in lithology, staining, odor, etc., rather than to constrain sampling depth to 5 feet bgs regardless of field conditions.**

Response: Samples are proposed at depths of 0 to 0.5 feet bgs and 5.0 to 5.5 feet bgs at four locations along the drainage ditch. A purpose of the SI is to determine the nature of COPCs which have migrated into the subsurface, not to determine the distribution of COPCs in the subsurface. PRC believes that sampling to a depth of 5.0 feet bgs will be sufficient to meet this objective. Variances in the sampling interval may occur if changes in lithology, staining, odor, or elevated readings from a photoionization detector are indicated. The text will be revised to include this information.

Comment 12: **p. 64, Section 5.9.2: It is unclear why at SWMU 14, where paints and paint thinner were used, metals and both volatile organic compounds (VOC) and semivolatile organic compounds (SVOC) will be analyzed for, but at SWMU 15, where paints and paint thinners were also supposed to have been used, metals and only VOCs are to be analyzed for. If only one class of chemicals is to be analyzed for, that class should be SVOCs.**

Response: A septic tank is located at SWMU 14. Because analytical data from other septic tanks indicate that VOCs, SVOCs, metals, and total oil and grease (TOG) are potentially present, these analytes were selected for analyses. At SWMU 15 no septic tank is known to have existed. The building may have been used to store paints and paint thinners. Analyses for SVOCs will be included at SWMU 15 so that a larger range of COPCs can be analyzed.

Comment 13: **p. 64, Section 5.10.2: Pesticides frequently contain heavy metals and/or cyanide or arsenic as active ingredients. In addition to pesticides/polychlorinated biphenyls (PCBs) to be analyzed for in 16-SB01, 16-HA04, and 16-HA05, metals and arsenic should also be considered COPCs and analyzed for. If these COPCs are found to be elevated in the vicinity of the former storage shed, they should be added to the list of COPCs for the entire SWMU in future investigations.**

Response: Metals and arsenic will be added to the list of analytes.

Comment 14: **p. 69, Section 5.15.1: Since the drain field is covered by a parking lot, will the "hand augered" shallow samples actually be advanced "by hand"? How will the protocol be altered to take the "surface sample" from the borings and avoid the possible contribution of material from the parking lot?**

Response: The asphalt will be cored to the top of the ground surface before sampling begins. No surface samples will be collected from these soil borings. Soil samples from 2.5 feet to 3.0 feet bgs and at 5.0 to 5.5 feet bgs will be collected. The text will be revised to clarify this procedure.

Comment 15: **p. 73, Section 5.18.2: The question of whether WHW-1 is truly "upgradient" of the proposed wells has not yet been resolved since it is not known whether WHW-1 or WHW-2 may be or may have been tidally influenced as a result of proximity to Otter Sluice during the period in which the tidal gates were not operating properly. It may be necessary, at some time in the future, to determine if the proposed wells may be tidally influenced.**

Response: A tidal influence study was conducted as part of the tidal area remedial investigation field work in 1994. Results indicated that monitoring wells along Otter Sluice may be tidally influenced but that monitoring wells further inland were not affected to any discernable degree. Therefore, WHW-1 is likely to be "upgradient" as stated in the text.

Comment 16: **p. 74, Section 5.19.2: The text states that "all soil samples will be analyzed for PCBs, TPHd, and benzene, toluene, ethylbenzene, and xylenes (BTEX)", and Table 10 reflects that plan. However, the footnote states that only PCBs will be analyzed for. Please explain this inconsistency. Table 11 indicates that one water sample would be taken and analyzed for TPHd, BTEX and PCBs, but the footnote states that only PCBs would be analyzed for. Please explain this inconsistency. If water is encountered in the shallow boring in the drainage ditch, 40-HA-03, will a "grab" water sample be taken? If water is present in the ditch at the time of sampling, will sediment sampling still take place?**

Response: The heading for this column in Tables 10 and 11 indicates that both pesticides and PCBs will be analyzed. The purpose of the footnote is to indicate that only PCBs will be analyzed for at SWMU 40 as stated in the text.

If ponded water is encountered during field activities, a surface water sample will be collected. Because the drainage is directly connected to the bay, it is anticipated that the drainage will be flooded. If this is the case, the sampling location will be moved to the east side of building 174, which faces the drainage. No surface water sample would be collected in this case. The text will be revised to clarify this procedure.

Comment 17: p. 75, Section 5.20.3: If the monitoring wells (44-MW-01 and 44-MW-02) are being installed to address concerns about the fact that SWMU 44 is in "an environmentally sensitive location," then the COPCs should also include TPHd or total recoverable petroleum hydrocarbons (TRPH) if there is some evidence that the USTs may have leaked. The drain fields may represent a preferential pathway for the movement of potential contamination due to the USTs and high concentrations of TOG, in a wetland soil, may be attributable, in part, to naturally occurring substances. Unless the distinction between petroleum hydrocarbons and naturally occurring carbon content is drawn, it will be assumed that all TOG is attributable to petroleum product from the USTs.

Response: To make a distinction between naturally occurring carbon and carbons related to petroleum products, TPHd will be added to the list of analytes for SWMU 44.

Comment 18: p. 87, Section 6.2.7: Excavated soils from the trenches should be managed such that if contaminated soil is found at a distinct vertical stratum, care should be taken to assure that soil from that stratum is not replaced into an otherwise uncontaminated stratum, especially at the bottom of the trench.

Response: Proper care will be taken to ensure that no more than 1 foot of soil is removed from the trench and stockpiled in a separate stockpile.

RESPONSES TO THE RWQCB'S COMMENTS ON THE DRAFT FIELD SAMPLING PLAN

SPECIFIC COMMENTS

Comment 1: **Section 1.1, bullet 3, page 2: The project objectives do not include determining the nature of chemicals present in surface water. This may be due, in part, because the presence of surface water at the site is generally an intermittent or temporary condition. However, the Regional Water Quality Control Board (RWQCB) is concerned about the potential impact to receiving water (i.e. Seal Creek, its tributaries, storm drains, the wetlands, or marsh) from the release of any hazardous waste. Therefore, if surface water is observed during the course of the field work *in locations where soil samples are taken*, water samples should be collected and analyzed appropriately.**

Response: PRC will include surface water with the SI objectives listed on pages 2 and 48. Surface water samples will be collected at locations as specified in response to the RWQCB's comments 11 and 15 on the field sampling plan.

Comment 2: **Section 4.2.1, SWMU 1, page 16, para 3: The Navy should clarify what is meant by "... a 1-foot deep water hole..." or determine what it is, and note its location on the figure. Since ponded water has been observed nearby in the past, the Navy's contractors should sample and analyze the water if evident at the time of field work.**

Response: The "water hole" referred to in the text is the same as the "hole in ground" referred to in Figure 10. For consistency, both will be referred to as "hole in ground."

The source of water is believed to be boiler purge water which leaked from a broken pipe leading to the purge water holding tank. While being operated, the boilers were purged after each shift change. Discussions with public works personnel indicated that leakage may have occurred over an extended period of time. The boilers were taken out of service during 1994, and no more leakage should occur from the broken pipe. WPNSTA Concord was notified of the broken pipe.

Comment 3: **Section 4.2.2, SWMU 2, page 18, para 4: Due to past practices of chemical residue disposal from the fire station, numerous soil samples are planned for the area of the drainage ditch downgradient from the storm drain mentioned here. It would be useful if the origin of the storm drain were known, as well as inlets to the drain, in evaluating analytical results and distinguishing between contributions other than those from historical chemical disposal.**

Response: PRC will investigate the storm drain concurrently with the field work. Plans of the storm drain system will be reviewed to determine the point of origin of inlets into the storm drain.

Comment 4: **Section 5.1, Septic Tank Investigations, page 50, para 3: Rationale should be provided for the proposed 15-foot depth for all deep soil borings in and around septic tanks. Deep soil borings proposed for other areas are typically planned to go to at least the depth of the water table.**

Response: The bottoms of septic tanks at WPNSTA Concord are approximately 5 feet below the ground surface. The proposed 15-foot depth was selected so that three samples can be collected at 5 foot intervals below the bottoms of the septic tanks. This will assist in determining if contaminant concentrations are decreasing with depth.

The purpose of the deep soil borings in the industrial area are to (1) determine whether contaminants are present in soil and groundwater and (2) evaluate the source of the VOC plume underlying SWMU 1. The source of this plume is unknown. SWMUs in the industrial area are upgradient of SWMU 1 and may be the source of the plume or contributing to it.

Comment 5: **Section 5.2.2, SWMU 1, page 53, para 3: The Navy should provide the status of MW-6 which was installed in 1993. According to the text (page 17) there is no mention of groundwater sampling from this well. Since the other monitoring wells installed in 1993 will be sampled as part of this investigation, the Navy should explain why MW-6 is not included in the sampling plan.**

Response: Monitoring well MW-6 was previously sampled and will be sampled along with MW-5 as part of the SI field activities. The text will be revised accordingly.

Comment 6: **Section 5.2.3, SWMU 1, page 53, para 3: Due to past practices, analytical parameters for this SWMU include pH, but pH analysis is only proposed for 01-SB01. Because of their proximity to the sand and grease trap, borings 01-SB02 and 01-SB03 should also be analyzed for pH.**

Response: The text will be revised to include pH as an analytical parameter for soil borings 01-SB02 and 01-SB03.

Comment 7: **Section 5.4.1, SWMU 5, page 56, para 2: This paragraph states that "Analytical data... [from boring 05-SB01]... will provide information to determine... whether a fuel release has occurred from the three USTs located 50 feet north of building IA-12." It is unclear as to the relationship between the location of the USTs referred to in Figure 13 and the proposed location of boring 05-SB01 located in the battery accumulation area. In addition, the proposed analysis for this sample includes only pH (page 57 - "VOCs, TPHd, and BTEX are not COPCs in soil for this area since only batteries were stored there"). The Navy should clarify the purpose of this boring and perform the appropriate analyses.**

Response: The deep boring was proposed to investigate whether COPCs in the battery storage area had migrated into soil and to determine if groundwater had been contaminated. The COPC identified with batteries is lead. The pH may also be affected by acid. Therefore, the soil samples will be analyzed for pH and lead. This area is not suspected of being a source for other COPCs in soil.

Three USTs are located approximately 50 feet upgradient of the battery accumulation area. It is possible the USTs or associated piping leaked. The text indicates that a groundwater sample will be collected from soil boring 05-SB01 to investigate this possibility. Other COPCs may have also migrated downgradient from other sources. Therefore, the groundwater sample will be analyzed for VOCs, SVOCs, TPHd, TPHg, TOG, metals, and pH.

Comment 8: **Section 5.4.3, SWMU 5, page 57, para 3: Because soil boring 05-SB02 is located near the fuel dispenser from three gasoline USTs, the analysis should include total petroleum hydrocarbons as gasoline (TPHg), as well as TPHd and BTEX mentioned in the report. Soil samples from boring 05-SB04 (oil/water separator - steam cleaning area) should be analyzed for metals, as well as VOCs, SVOCs, TPHd, and TOG mentioned in the report.**

Response: The text will be revised to include TPHg and metals as analytes for soil borings 05-SB02 and 05-SB04, respectively.

Comment 9: **Section 5.7.2, SWMU 13, page 62, para 2: Given the historical use of ordnance reconditioning, soil, liquid, and sludge samples should be analyzed for explosives-related compounds.**

Response: Past records show that hexahydro-1,3,5-trinitro-s-trianzine (RDX), pentaerythritol tetranitrate (PETN), lead styphnate, and lead azide were developed as military explosives at building IA-25. Soil, liquid, and sludge samples will also be analyzed for these explosive compounds.

Comment 10: **Section 5.8.1, SWMU 14, page 63, para 1: In the drainage and creek locations where shallow soil borings are proposed, ponded water should also be collected if evident during the field work, and analyzed appropriately.**

Response: Building IA-27 is now being used as a storage facility. Otherwise, neither building IA-27 nor the septic tank are now in use. Any ponded water analyzed may contain COPCs carried downstream from other sites. This may cause confusion in identifying site COPCs. Therefore, no sampling of the ponded water is proposed.

Comment 11: **Section 5.12.1, SWMU 18, page 67, para 3: In the drainage locations where shallow soil borings are proposed, ponded water should also be collected if evident during the field work, and analyzed appropriately.**

Response: PRC proposes to collect surface water, if present, from two locations (18-SW01 and 18-SW02) along the drainage. The locations will be determined during field activities. The surface water samples will be analyzed for metals. A new subsection will be added to Section 6.0 of the FSP to address surface water sampling. A standard operating procedure (SOP) on sampling surface water will be added to Volume II.

Comment 12: **Section 5.14.1, SWMU 22, page 68, para 6: The Navy should clarify why no deep soil samples are proposed for the area between the drain field and the**

drainage ditch (as proposed at other septic tank locations), especially given the topography of the area.

Response: No deep soil sampling will be performed because the drainage ditch is too close to the septic tank. Soil samples from three locations (22-HA05, 22-HA06, and 22-HA07) along the drainage are proposed. Soil borings at each location will be hand-augered to 5 feet bgs. Soil samples will be collected at 0 to 0.5 foot and 5.0 to 5.5 feet. The soil samples will be analyzed for VOCs, SVOCs, TOG, and metals.

Comment 13: Section 5.14.2, SWMU 22, page 69, para 2: Based on the use of ordnance maintenance at the building, the analytical parameters should include explosives-related compounds.

Response: Activities at building 81 included testing fuses and maintenance of explosives. It is possible that during these activities explosives were washed into the sewer system. Explosives will be added to the analytical parameters to be analyzed. The explosives to be analyzed will include PETN and RDX.

Comment 14: Section 5.18.1, SWMU 37, page 73, para 1: The Navy should provide the rationale for the proposed locations of the two new monitoring wells 37-MW01 and 37-MW02.

Response: PRC recommended during the October 18, 1994, installation status meeting that the two monitoring wells not be installed. The wells will be replaced by two soil borings from which groundwater samples will be collected. The location of 37-MW01 (now 37-SB01) will be moved to the west end of building A-29. Treated wood was stored at this location. The location of 37-MW02 (now 37-SB02) will not be changed. The location was selected to investigate whether COPCs had migrated to the north. Analytical parameters will remain the same.

Comment 15: Section 5.23.1, SWMU 52, page 78, para 3: In the drainage locations where shallow soil borings are proposed, ponded water should also be collected if evident during the field work, and analyzed appropriately.

Response: Building 7SH5 is now active. Liquid from the septic tank may migrate into the drainage ditch. Therefore, one surface water sample (52-SW01) will be collected from the drainage ditch, if possible. The sampling location will be selected during the SI field activities. The surface water sample will be analyzed for VOCs, SVOCs, TOG, and metals.

RESPONSES TO THE EPA'S COMMENTS ON THE
DRAFT QUALITY ASSURANCE PROJECT PLAN

SPECIFIC COMMENTS

Comment 1: **p. 27, Table 7: The Contract Required Quantitation Limits (CRQLs) for the following Volatile Organic Compounds (VOCs) exceed the indicated USEPA Ambient Water Quality Criteria: carbon tetrachloride: human health, one-in-a-million incremental cancer risk (HH 10^{-6}); bromodichloromethane: HH 10^{-6}; tetrachloroethene: non-cancer public health effects (HH); 1,1,2,2,-tetrachloroethane: HH. If water samples exhibit non-detections at the proposed contract required detection limits (CRDL), how will the potential for risk from exposure to these VOCs be evaluated?**

Response: The use of contract laboratory program (CLP) methods is a practical, cost-effective way to analyze most contaminants of concern during the site investigation (SI) phase of a project. The purpose of a site investigation is to assess whether contamination exists at a site and whether further investigation is necessary. Determining this will be based on a number of factors, only one of which is the nondetection of analytes of concern. Other factors include the evaluation of (1) the site history; (2) chemicals used, stored, or disposed of at the site; (3) degradation products, if any, that may be present; (4) detection or nondetection of analytes; (5) the analytes detected in other media, for example an analyte detected in soil but not in groundwater; (6) other similar types of chemicals (in usage and chemical characteristics) detected at the site; and (7) the toxicity effects of the chemical and the population of sensitive receptors located on or near the site. All these factors will be used to evaluate the potential risk from exposure to specific contaminants. If further investigation is warranted, the non-CLP methods will be considered to evaluate the presence of chemicals once actual site conditions, groundwater quality, and applicable or relevant and applicable requirements (ARAR) are better established.

Comment 2: **pp. 29-30, Table 8: The CRDLs for the following semivolatile organic compounds (SVOCs) exceed the indicated USEPA Ambient Water Quality Criteria: Bis(2-chloroethyl)ether: HH hexachloroethane: HH 10^{-6}; 2-chloronaphthalene: FWC 3 µg/l; 2,4-dinitrophenol: HH 10^{-6}; diethylphthalate: FWC 3 µg/l, SW 3 µg/l; n-nitrosodiphenylamine: HH 10^{-6}; hexachlorobenzene: FW Max 6 µg/l; pentachlorophenol: maximum contaminant level (MCL) 1µg/l, SW 7.9 µg/l; di-n-butylphthalate: FWC 3 µg/l; butylbenzylphthalate: FWC 3 µg/l; 3,3'-dichlorobenzidine: HH 10^{-6}; benzo)a)anthracene HH 10^{-6}; chrysene: MCL 0.2 µg/l; bis(2-ethylhexyl)phthalate: MCL 6 µg/l, FWC 3 µg/l; di-n-octylphthalate: FWC 3µg/l; benzo(b)fluoranthene: HH 10^{-6}; benzo(k)fluoranthene: HH 10^{-6} benzo(a)pyrene: HH 10^{-6}; ideno(1,2,3-cd)pyrene: MCL 0.4 µg/l; dibenzo(a,h)anthracene: MCL 0.3 µg/l. If water samples exhibit non-detections at the proposed CRDLs, how will the potential for risk from exposure to these SVOCs be evaluated?**

Response: The quantitation limit for bis(2-ethylhexyl)phthalate will be lowered to meet the MCL of 6 μg/L. The other MCLs listed have not been promulgated and will not be met during the SI phase of this project. Please see response to EPA's comment 1 on the quality assurance project plan (QAPjP).

Comment 3: **p. 31, Table 9: The CRDLs for the following pesticides and PCBs exceed the indicated USEPA Ambient Water Quality Criteria: alpha-BHC: HH 10^{-6}; beta BHC: HH 10^{-6}; gamma-BHC: HH 10^{-6}; heptachlor: FW 0.0038 μg/l, SW 0.0036; aldrin HH 10^{-6}; heptachlor epoxide: FW 0.0038, SW 0.0036; endosulfan SW Max 0.034 μg/l; dieldrin: HH 10^{-6}, FW 0.0019; 4,4'-DDE: HH 10^{-6}; endrin: SE 0.0023 μg/l; 4,4'-DDD: HH 10^{-6}; endosulfan sulfate: SW 0.0087 μg/l; 4,4'DDT: HH 10^{-6}, FW 0.001, SW 0.001; methoxychlor: SW 0.003 μg/l; chlordane: HH 10^{-6}; toxaphene: FW 0.73 μg/l; total PCBs: HH 10^{-6}, SW 0.03 μg/l. If water samples exhibit non-detections at the proposed CRDLs, how will the potential for risk from exposure to these pesticides and PCBs be evaluated?**

Response: Please see response to EPA's comment 1 on the QAPjP.

Comment 4: **p. 33, Table 10: The CRDLs for the following inorganic analytes exceed the indicated USEPA Ambient Water Quality Criteria: arsenic: HH 10^{-6}; cadmium: FW 0.55 μg/l; copper: FW 5.4 μg/l, SW 2.9 μg/l; lead: 0.99 μg/l; mercury: HH 10^{-6}, FW 0.012 μg/l; nickel: SW 8.3 μg/l; silver: FW 0.12 μg/l, SW 0.92 μg/l; thallium: MCL 2 μg/l; vanadium: HH 20 μg/l. If water samples exhibit non-detections at the proposed CRDLs, how will the potential for risk from exposure to these inorganic analytes be evaluated?**

Response: The quantitation limit for thallium will be lowered to meet the MCL of 2 μg/L. Quantitation limits for other metals will not be lowered during the SI phase of the project. Please see response to EPA's comment 1 on the QAPjP.

RESPONSES TO THE DTSC'S COMMENTS ON THE DRAFT QUALITY ASSURANCE PROJECT PLAN

SPECIFIC COMMENTS

Comment 1: **Section 2.1: Project Organization: It may be informative to describe the backgrounds of the team members.**

Response: The following information will be included in the QAPjP:

CLEAN Program Manager: Daniel Chow

Mr. Chow has 19 years of experience with PRC in program management and environmental engineering, specializing in work dealing with hazardous, toxic, industrial, and municipal waste issues in military installations, national priorities list (NPL) sites and RCRA facilities. Mr. Chow has been the program manager on PRC's CLEAN contract for 3 years.

Project Manager: Barbara Sootkoos

Ms. Sootkoos is an experienced engineer who has provided technical support to several environmental studies and investigations. Her experience includes planning and coordinating site investigations; preparing remedial work plans for remedial investigation/feasibility studies (RI/FS); specifications and cost estimates for remedial designs; and preparing engineering evaluations/cost analyses (EE/CA) for removal actions.

QA Program Manager: Ken Partymiller

Dr. Partymiller has 20 years of experience as a chemist performing field investigations, data and technology evaluations, fate and transport studies, and laboratory QA audits for hazardous waste sites.

Project QA Officer and Chemist: Thorsten Anderson

Mr. Anderson is an environmental chemist with more than 5 years of professional experience in analytical chemistry, data interpretation, and QA/QC. Mr. Anderson has worked as a project chemist on the following installations: Hunters Point Annex Naval Shipyard, Naval Air Station Lemoore, and Naval Station Treasure Island.

Health and Safety Program Manager: Fred Stanley

Dr. Stanley has over 28 years of comprehensive managerial and technical experience in all aspects of industrial hygiene, occupational health and safety, environmental science, and ionizing radiation and non-ionizing radiation hazard control.

Field Team Leader: Ken Bowen

Mr. Bowen is a hydrogeologist with more than 9 years of professional experience in conducting geologic and hydrogeologic investigations, directing field operations, computer modeling, aquifer testing, and data reduction and analysis.

Comment 2: **Section 3.0: Data Quality Objectives: The Data Quality Objectives (DQO) were not found here nor in the Field Sampling Plan (FSP) as stated.**

Response: The following is a three-stage process for developing DQOs:

- Identifying project objectives
- Specifying the data necessary to meet project objectives
- Identifying and describing the methods that will yield data of acceptable quality and quantity to support the required decisions

The first stage of the DQO development process is presented in Section 1.1 of the FSP. The second stage is presented in Sections 5.0 through 5.25. The third stage is presented in Sections 3.0 through 3.5 of the QAPjP.

Comment 3: **Section 8.8: Total Oil and Grease: Why do we want to detect vegetable oils or other oils of biological origin? By performing test methods 5520C <u>and</u> E (instead of just C), only oil and grease of petroleum origin will be reported. If the data must be compared with previous data, then the methods should remain the same.**

Response: Test methods 5520C and E will be performed to evaluate mineral and petroleum oils.

Comment 4: **Section 9.1.1: Field Duplicate Sample: Only duplicates of water samples are mentioned. Duplicates should be obtained of soil samples as well.**

Response: Field duplicate samples are analyzed to assess the consistency of the overall sampling and analytical system. Water samples, which are homogeneous, are collected from the same source, enabling the data reviewer to evaluate both the sampling and analytical consistency. Soil samples are nonhomogeneous, and duplicate samples are collected from two discrete locations, making it impossible to evaluate the sampling and analytical consistency. In the laboratory, both water and soil duplicate analyses are performed as a measure of analytical consistency.

Comment 5: **Section 9.3: Laboratory Quality Control Samples: In view of the recent fraud detected at some laboratories and the amount of effort and cost in dealing with the questionable results, it may be advisable to split some of the samples and send them to a reference lab. Alternatively, blind performance samples could be sent to the laboratory during this investigation rather than annually.**

Response: A set of double blind performance evaluation samples will be sent to the laboratory during this investigation to evaluate the quality of the laboratory. All laboratories contracted to work by the Navy in the Comprehensive Long-Term Environmental Action Navy (CLEAN) program participate in a yearly program of single blind performance evaluation samples. Evaluation of these results, routine validation of all analytical data, and periodic audits of each laboratory ensure excellent data quality.

Comment 6: **Section 11.1: Laboratory Audits: The results of the last laboratory audit and performance samples should be available to the data reviewers for this project.**

Response: All laboratory audit report and performance evaluation sample results are available to the project staff, including the data reviewers. Once the analytical laboratory for this project has been selected, the performance evaluation sample results and the audit report will be reviewed.

Comment 7: **Section 13: Quality Assurance Reports: If not already stated elsewhere, a summary of the various findings reported in the quality assurance reports should be included with the final report for the project.**

Response: A quality control summary report (QCSR) will be summarized and included in the SI report.

RESPONSE TO THE DTSC'S COMMENTS ON THE DRAFT HEALTH AND SAFETY PLAN

SPECIFIC COMMENTS

Comment 1: **Page 21, Section 3.3.5: The last paragraph indicated that battery acid was dumped at Building IA-24 and that the soil would neutralize the acid and bind lead to the soil. However, the lead could become airborne, and should be sampled to determine whether hazardous levels exist. Please address justification for no further action.**

Response: From the health and safety perspective, there will not be any intrusive activities at the site. Since lead is bound to the soil, there is not a reason to believe that it will become airborne.

If any activity is conducted at this site, personnel will be expected to perform air monitoring for lead, and use the appropriate level of personal protective equipment (PPE).

Comment 2: **Page 83, Section 11.0. Emergency equipment, such as first-aid kits, fire extinguishers and spill containment equipment are not discussed in the emergency plan. Please include.**

Response: The following text will be included at the end of Section 11.2: "Emergency equipment, such as first aid kits, fire extinguishers, and spill-containment equipment, will be located at the support zone."

Comment 3: **Page 101, Table 3. The table fails to provide toxic characteristics of a number of chemicals listed. For instance, copper arsenate will have problems associated with exposure to the heavy metal, as well as exposure to arsenic. If the effects are only chronic, they should be mentioned. A simple "NA" is inadequate for hazard communication. Please amend the table.**

Response: The table will be amended to clarify the toxic characteristics of the chemical.

RESPONSES TO THE DTSC'S COMMENTS ON THE STANDARD OPERATING PROCEDURES

GENERAL COMMENT

Comment: **Several of the SOPs reference other SOPs which have not been provided in Volume 2. For example, SOP 5 references SOP 17; SOP 6 references SOPs 16, 18, and 19, etc. This does not allow for evaluating the appropriateness of the references. Some SOPs mention documenting the location of samples (see SOP 6, page 5, item 3) while others do not. Perhaps a new SOP should be written detailing how to locate the sampling locations and then referenced by all of the appropriate SOPs.**

Response: SOPs 8, 9, 16, 17, 18, 19, 27, 28, 46, and 47 are referenced. Four of these (16, 17, 18, and 19) are addressed in the QAPjP. Three (SOPs 8, 46, and 47) will not be used during the SI. SOPs 27 and 28 will not be added, since SOP 26 sufficiently addresses soil sample classification. An introduction will be added to Volume 2 stating why these SOPs were not included. SOP 9 will be included because surface water sampling is being proposed. Refer to the RWQCB's comments 11 and 15 on the field sampling plan.

Section 6.5 of the FSP indicates how soil boring and monitoring well locations will be documented by being surveyed. Since surface water sample locations will not be surveyed, locations will be documented in detail in the field.

SPECIFIC COMMENTS

Comment 1: **SOP 5: It states that a trowel should be made of stainless steel or galvanized steel. The latter should not be used if zinc is a concern. Page 13, 2d paragraph: Should be altered to read that sleeves will be employed when sampling for volatiles to avoid losses from transferring into containers. Page 13, last paragraph: The method for sampling volatiles described here is unacceptable, and this section contradicts the list on page 11 denoting analysis for this sampling method.**

Response: The text will be revised to state that stainless steel trowels will be used.

The text will be revised to indicate that sleeves, not vials, will be used for sample collection.

The text will be revised to state that no samples for chemical analyses will be collected from shelby tubes. Instead, a sample will be collected immediately beneath the shelby tube sample interval using a split-spoon sampler.

Comment 2: **SOP 6, page 7, 3rd paragraph and page 8, last paragraph: The statement "Liners also may require decontamination..." should be changed to "must require." Anything coming into direct contact with the samples and especially anything which can be considered a container for the samples must be scrupulously cleaned and meet cleanliness standards similar to other containers.**

Response: The SOP will be revised to state that all liners must require decontamination prior to use.

Comment 3: **SOP 44, Section 2.2: Consider including in the instructions that debris (rocks, glass, twigs, and grass) be removed from the surface prior to initiating sampling. This suggestion applies to all the soil/sediment sampling SOPs.**

Response: SOP 44, Section 2.2, Item 3, will be revised to include the following sentence: "Remove all debris from the surface of the sampling area."

Comment 4: **SOP 10, Section 2.3.3, 1st paragraph: Consider replacing the frequency for redevelopment with a criteria, such as sediment buildup or recharge reduction.**

Response: Section 2.3.3 of SOP 10 will be revised to state that redevelopment should occur if sediment buildup in the well is indicated.

Comment 5 **SOP 12, Section 2.1, page 4: It should be clear that calibration is an iterative process and you repeat steps 4 and 5 adjusting the zero and slope (temperature adjust) until both buffers read correctly without further adjustment.**

Response: The following step has been added to the calibration process:

5. Repeat steps 3 and 4 adjusting the zero and slope until both buffers read correctly without further adjustment.

Comment 6: **SOP 2: Decontamination of liners mentioned in other SOPs should be addressed here.**

Response: SOP 2 will be revised to include decontamination of liners.