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ALAMEDA POINT
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UNEXPLODED ORDNANCE SITE INVESTIGATION

SURVEY WORK PACKAGE OPERABLE UNIT (OU) #3 ALAMEDA POINT ALAMEDA, CALIFORNIA

Site Plan

FINAL

08-2-1988

USEN ENVIRONMENTAL DETACHMENT
ALAMEDA, CALIFORNIA



UNEXPLODED ORDNANCE SITE INVESTIGATION

SURVEY WORK PACKAGE OPERABLE UNIT (OU) #3 ALAMEDA POINT ALAMEDA, CALIFORNIA

INCLUDED:

Part 1 – Survey Work Plan

Part 2 – Standard Operating Procedure No. 180

Part 3 – Health and Safety Plan

FINAL

May 2, 1999

**SSPORTS ENVIRONMENTAL DETACHMENT
VALLEJO, CALIFORNIA**



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SITE INVESTIGATION**

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OPERABLE UNIT (OU) #3
ALAMEDA POINT
ALAMEDA, CALIFORNIA**

FINAL

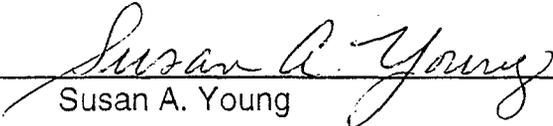
May 2, 1999

Part 1 of the Unexploded Ordnance Survey Work Package

**SSPORTS ENVIRONMENTAL DETACHMENT
VALLEJO, CALIFORNIA**

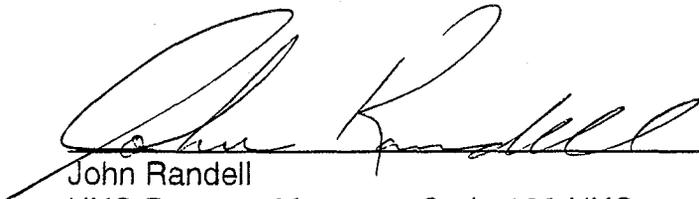
SURVEY WORK PLAN
UNEXPLODED ORDNANCE SITE INVESTIGATION
OPERABLE UNIT (OU) #3
ALAMEDA POINT, ALAMEDA, CALIFORNIA

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LIST OF ACRONYMS

CERCLA	Comprehensive Environmental Response and Compensation Liability Act
CFR	Code of Federal Regulations
CS	Ortho-chlorobenzalmalonitrile
DGPS	Differential Global Positioning System
DLA	Defense Logistics Agency
DTSC	Department of Toxic Substances
EFA	Engineering Field Activity West (Department of the Navy)
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
ESO	Explosives Safety Officer
GIS	Geographic Information System
HASP	Health and Safety Plan
HEDP	High Explosive Dual Purpose
IR	Installation Restoration
MK	Mark
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
NEHC	Navy Environmental Health Center
OPNAVINST	Chief of Naval Operations Instruction
OU	Operable Unit
PA/SI	Preliminary Assessment/Site Investigation
PCB	Polychlorinated Biphenyl
RI	Remedial Investigation
RWQCB	Regional Water Quality control Board
SOW	Statement of Work
SSPORTS	Supervisor of Shipbuilding, Conversion, & Repair - Portsmouth VA Environmental Detachment, Vallejo
TTLC	Total Threshold Limit Concentration
UXO	Unexploded Ordnance

**WORK PLAN
UNEXPLODED ORDNANCE SURVEY
SITES IR-1 AND IR-2 AT OPERABLE UNIT 3
ALAMEDA POINT**

1. INTRODUCTION

The Supervisor of Shipbuilding, Conversion and Repair, Portsmouth (SSPORTS), Virginia was tasked by Engineering Field Activity West (EFA West), Naval Facilities Engineering Command (NAVFAC) to perform an Ordnance Preliminary Assessment and Site Investigation (PA/SI) of Installation Restoration (IR) Sites IR-1 and IR-2 as outlined in the Ordnance Preliminary Assessment of Operable Unit (OU) 3 Scope of Work (SOW) dated 17 February 1999 (reference 1). The site investigation will be conducted under the authority of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) (reference 2).

The Unexploded Ordnance (UXO) Survey Work Package consists of three parts; Part 1 is the Unexploded Survey Work Plan, Part 2 is Standard Operating Procedure (SOP) No. 180, and Part 3 is the site specific Health and Safety Plan (HASP). Part 1 accomplishes Task 1 and supports Tasks 2 through 4 of the SOW, and includes information obtained during the historical data review and personnel interviews (Task 3). A more detailed report of the information obtained during the accomplishment of Task 3 will be submitted with the Final Report. This work plan also describes the procedures that will be used to perform the surface search and geophysical survey. Part 2 describes the step-by-step procedures for handling and transporting recovered unexploded ordnance to a temporary storage magazine pending disposal. Part 3 addresses the specific health and safety issues, and establishes the responsibilities, requirements and procedures for the protection of personnel at the work site.

1.1 PURPOSE

The purpose of the Ordnance Preliminary Assessment and Site Investigation is to determine if unexploded ordnance exists at Sites IR-1 and IR-2 by conducting a surface search of the areas and, based on the results of the surface search and historical data review, conducting a geophysical survey, as necessary, to identify subsurface anomalies that may indicate the presence of UXO within each site.

1.2 PROJECT ORGANIZATION

Site work will be accomplished under the direction of the Project Manager assisted by a staff of engineers, technicians, surveyors and UXO Specialists. Qualified/certified personnel from SSSPORTS Environmental Detachment Vallejo will be used for the search, identification, characterization, recovery, and transport of recovered ordnance.

1.3 HEALTH AND SAFETY

A Site Specific Health and Safety Plan (HASP) has been developed for the site to ensure a safe work environment, provide a uniform and concise emergency plan of action, and to provide site personnel with the necessary information to adhere to these

policies in accordance with U.S. Army Corps of Engineers Safety and Health Requirements Manual EM 385-1-1 (reference 3). The HASP is submitted as Part 2 of the Survey Work Plan. The programs and procedures contained in the HASP are based on an evaluation of potential site hazards and meet all applicable requirements concerning explosive safety, environmental safety, and occupational safety and health. The HASP is an addendum to the Navy Occupational Safety and Health Program Manual, OPNAVINST 5100.23E (reference 4) and to the Prevention and Treatment of Heat and Cold Stress Injuries Technical Manual, Navy Environmental Health Center Manual NEHC-TM92-6, reference 5.

2. LOCATION

Alameda Point is located on the west end of Alameda Island, which lies on the east side of San Francisco Bay, adjacent to the City of Oakland. Alameda Point is rectangular in shape, approximately 2 miles long east to west, 1 mile wide north to south, and occupies 1,734 acres. (Figure 1). Sites IR-1 and IR-2 are located within Installation Restoration (IR) Operable Unit 3, at the north and southwestern corners of Alameda Point.

3. BACKGROUND

The U.S. Navy conducted a remedial investigation (RI) from 1988 to 1995, with oversight from the California Department of Toxic Substances Control (DTSC), the San Francisco Bay Regional Water Quality Control Board (RWQCB), and the U.S. Environmental Response, Compensation and Liability Act CERCLA (EPA 1988a). As a result of these investigations, extensive radiological surveys were performed at Alameda Point. During a radiological survey of Site IR-1 conducted in September 1998 (reference 6), a number of 20mm high explosive projectiles were discovered. As a consequence of this, the UXO Specialists from SSPORTS Environmental Detachment Vallejo conducted an emergency removal action on Site IR-1 (Figure 2) in accordance with Standard Operating Procedure (SOP) No. 140, Immediate/Emergency Response On-Site Demolition Operation (reference 7). A total of 335 live 20mm high explosive projectiles and 2 live small arms cartridges (one .45 caliber ball round, and one .30 caliber ball round) were recovered during the removal action. Additional inert ordnance material recovered included 12,259 20mm projectiles, 1,686 .50 caliber armor piercing projectiles and 359 assorted brass cartridges. Also discovered during the preliminary surface sweep was a portion of the arming mechanism from a 40mm high explosive dual purpose (HEDP) grenade fuze together with the remains of electric blasting cap leads, packaging, and firing wire. This would indicate that ordnance disposal operations had been conducted in the area at some time.

4. HISTORY

The following information was obtained during an extensive review of available historical data for Operable Unit 3 and from personnel interviews conducted in March 1999 to determine the history of Sites IR-1 and IR-2.

The western tip of Alameda Island was farmed in the 1800s before becoming an industrial and transit center. Railroad yards and rights-of-way for Southern Pacific,

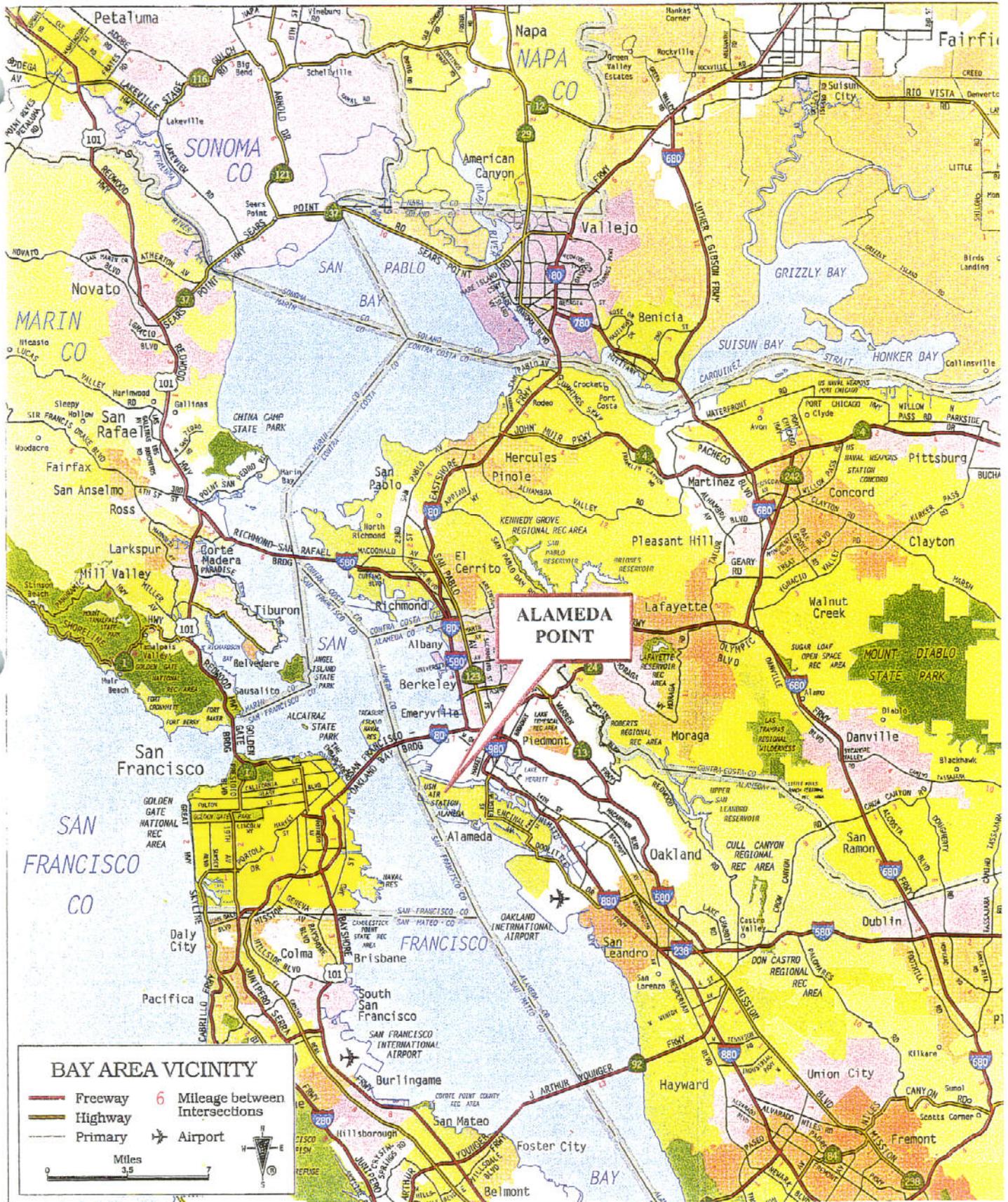


FIGURE 1. ALAMEDA POINT LOCATION MAP



This photo shows the treatment by open detonation of 335 live ordnance items recovered during the emergency removal action at Alameda Point. The disposal operation was conducted by qualified UXO Specialists from SSPTS Environmental Detachment Vallejo. The ordnance items were discovered during a radiological survey and subsequent preliminary surface sweep of Site IR-1. All other ordnance items recovered were certified inert by the UXO Specialist and disposed of as scrap material. (SSPTS UXO Photo, 12/98)

FIGURE 2. EMERGENCY REMOVAL ACTION

Central Pacific and small local railways were built over the site and sloughs to the north in the late 1800s. The western terminus for the transcontinental railroad was at the southeast corner of the site for a short period in 1869. Before 1930, at least two large industrial sites (an oil refinery and a borax processing plant) were located at the southwestern tip of Alameda Island. The U.S. Army acquired the western tip of Alameda from the City of Alameda in 1930 and began construction activities in 1931. In 1936, the Navy acquired title to the land from the Army and began building the Naval Air Station Alameda (NAS Alameda), which was commissioned on 1 November 1940. The construction involved filling the natural tidelands, marshes, and sloughs between the Oakland Inner Harbor and the western tip of Alameda Island. The fill largely consisted of dredge spoils from the surrounding San Francisco Bay and Oakland Inner Harbor. Alameda Point was identified for closure under the Department of Defense Base Realignment and Closure Act (BRAC) in September 1993 (reference 8) and the installation ceased all naval operations in April 1997.

4.1 SITE IR-1

Site IR-1 is typically flat with slight depressions that temporarily flood during the winter rains. The site consists of paved runway areas, non-native grasslands, disturbed areas, and a jogging trail. The runway tarmac provides an important nesting habitat for sensitive species such as the California Least Tern. Ryegrass, yellow sweet clover, and common plantain dominate the non-native grasslands. Black-tailed jackrabbits, Canada geese, and European starlings are the dominant animal species in this habitat. The disturbed areas contain uninhabited buildings, building foundations and the former pistol range. Grasses are the dominant vegetation in this area and feral rabbits the dominant animal species.

4.1.1 LOCATION AND CONSTRUCTION HISTORY

Site IR-1, the "1943-1956 Disposal Area" (Figure 3), is located in the northwestern corner of Alameda Point. The site was operated between 1943 and 1956 as NAS Alameda's main site for waste disposal. Historical aerial photographs and early maps show that prior to 1940, the area occupied by the land fill was covered by the San Francisco Bay. A geodetic survey chart for NAS Alameda from 1942 shows water as deep as 20 feet at what is now the western shoreline at Site IR-1. A rock seawall, originally a jetty protecting the harbor entrance, lies at the northern perimeter of the landfill and was in place prior to 1915. Construction history obtained from Alameda Point archival drawings and aerial photos show that sunken barges and pontoons were placed along the western side of the site adjacent to the Bay. Natural sedimentation of clayey and silty material likely built up along the barges, which provided structures for placing hydraulic fill. The disposal area was originally filled with dredge spoils during the early 1940's. Evidence of disposal operations is shown in aerial photos taken during WWII. In the 1950s, new runways and taxiways were extended over a portion of the landfill (Figure 4). According to a screening questionnaire completed by the Navy on June 21, 1988, the landfill has no liner, and the depth of waste is unknown. In addition, no maintenance was performed at the site.

4.1.2 WASTE DISPOSAL HISTORY

The principal waste disposal method used by Public Works personnel consisted of digging trenches to the water table, filling them with waste, and compacting the material with a bulldozer. Cover material was applied on a regular basis. In the early operations at both sites, waste was simply pushed into the water. Estimates of the total amount of waste and the amount of hazardous materials disposed of at both sites varies. These estimates are based largely on individual recollection and judgment; however, some quantification of the amount of hazardous material was possible, based on industrial process information.

An estimated 15,000 to 200,000 tons of waste were placed in Site IR-1, including old aircraft engines, low-level radiological wastes, scrap metal, waste oil, paint wastes, solvents, cleaning compounds, and construction debris. In addition, other naval installations disposed of wastes at this site, including the Oak Knoll Naval Hospital, Naval Supply Center Oakland, and Treasure Island. Materials reportedly disposed of at the landfill included municipal garbage, sludges, plating wastes, acids, mercury,

NAVAL AIR STATION ALAMEDA, CA

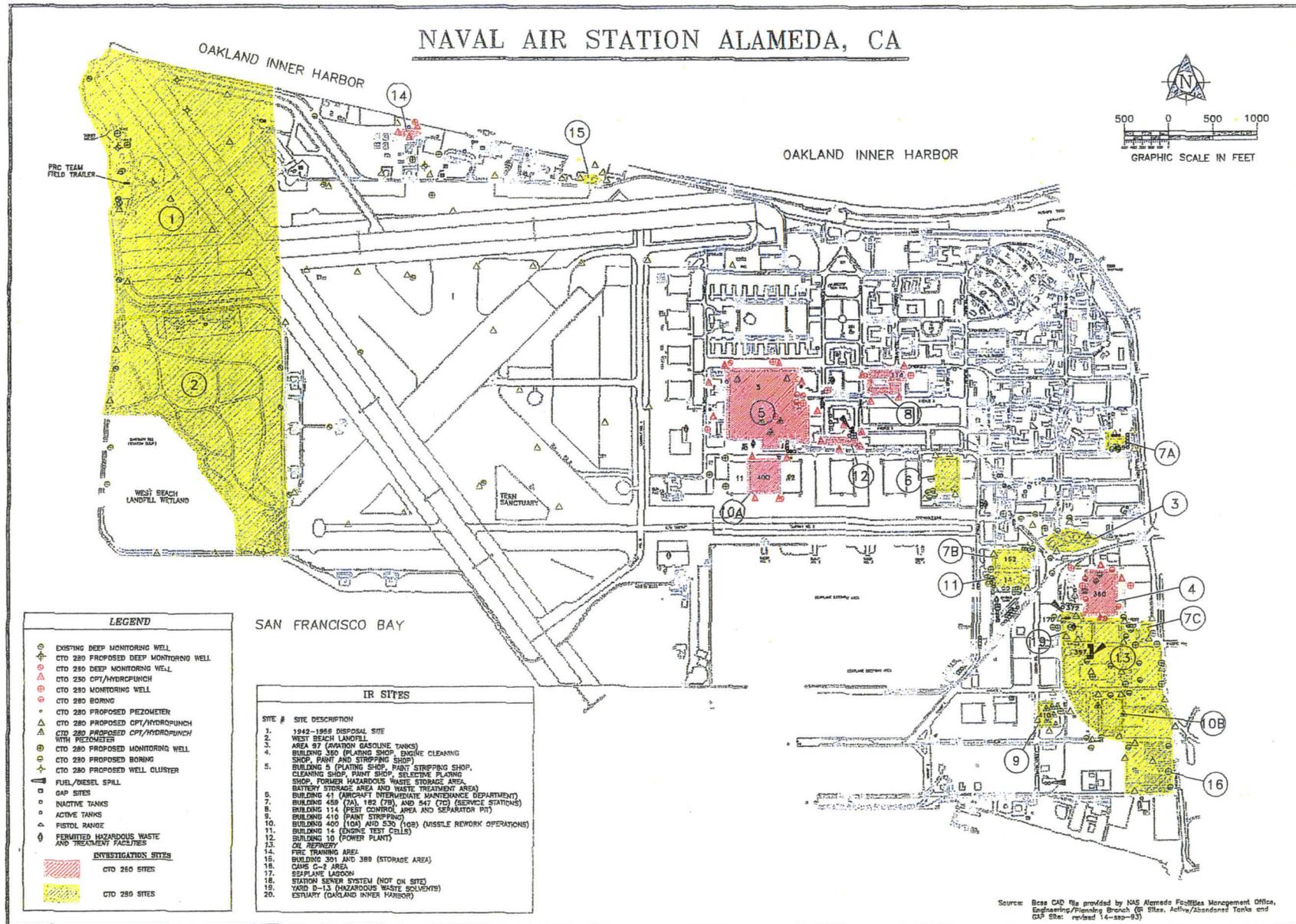


FIGURE 3. SITES IR-1 AND IR-2

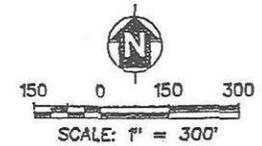
Source: Base CAD file provided by NAS Alameda Facilities Management Office, Engineering/Planning Branch (R Sites, Active/Abandoned Tanks and CAP Sites, revised 14-SEP-93)

FIGURE 4. SITE IR-1 PHYSICAL FEATURES MAP

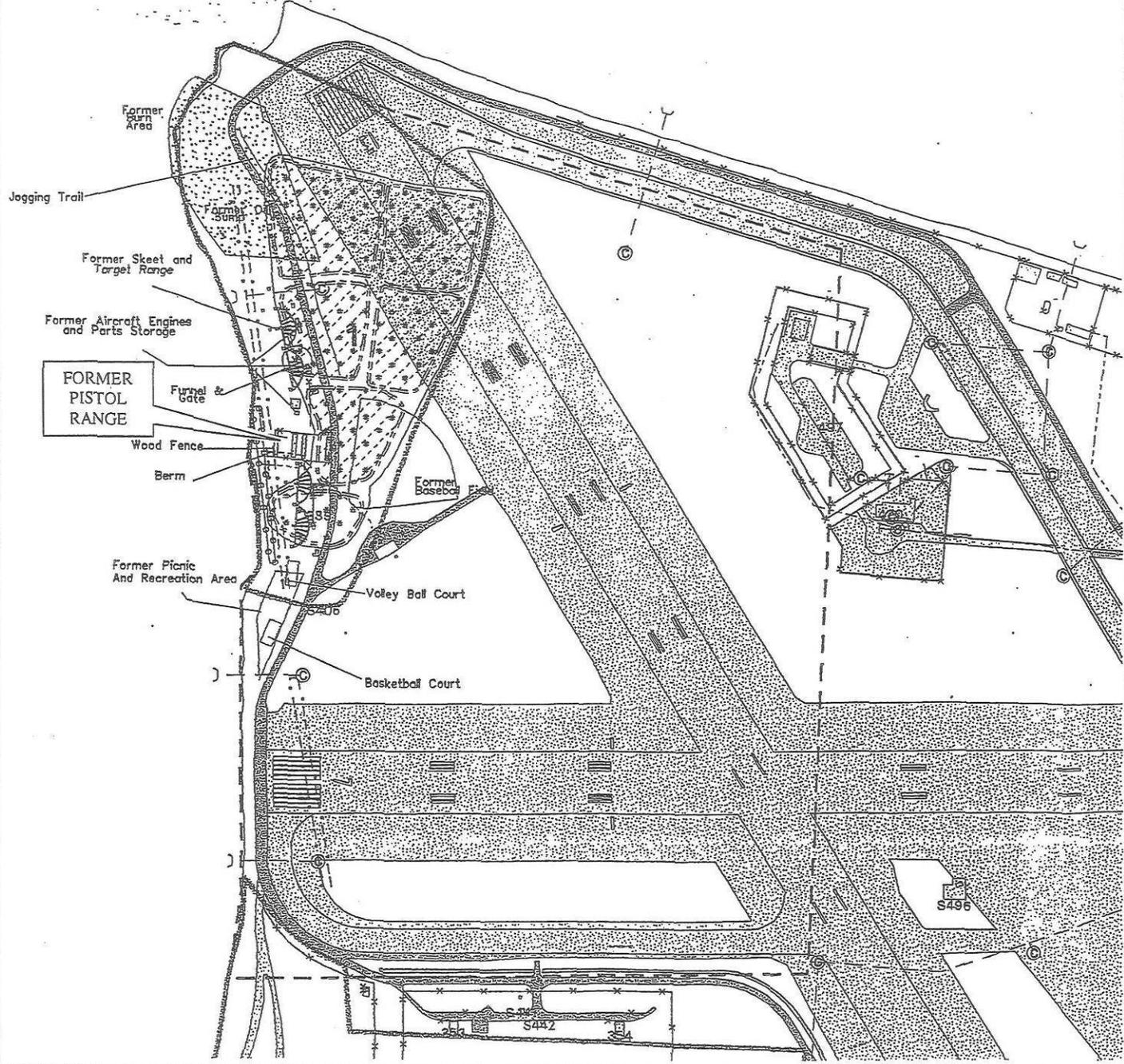
LEGEND

- ⊙ STORM DRAIN CATCH BASIN
- ORIGINAL INSTALLATION RESTORATION SITE (OUTSIDE BOUNDARY)
- - - FENCE
- ▨ PAVED ROAD OR PARKING LOT
- ▩ BUILDING OR CONCRETE, PAVED, OR COVERED AREA
- ▧ INSTALLATION RESTORATION SITE (INSIDE BOUNDARY)
- 517 BUILDING AND BUILDING NUMBER
- ▨ 1947 DISPOSAL ACTIVITIES
- ▩ 1949 DISPOSAL ACTIVITIES
- ▩ 1957 DISPOSAL ACTIVITIES
- - - WASTE DISPOSAL CELL BOUNDARY
- - - BARGE LINES (1949 AERIAL SURVEY)
- - - BARGE LINES (1957 AERIAL SURVEY)

NOTE: BARGE LINES ARE INFERRED



SITE 1
PHYSICAL FEATURES
MAP
ALAMEDA POINT
ALAMEDA, CALIFORNIA



polychlorinated biphenyl (PCB) contaminated fluids, TAC rags, batteries, inert ordnance, spoiled food, asbestos, pesticides, creosote, waste medicines and reagents.

4.1.3 PISTOL RANGE

The pistol range area is located in the western portion of Site IR-1 (Figure 4) and consists of a pistol range, a shotgun range, and an area immediately north of the pistol range used for disposal of spent ordnance (20mm, lead bullets and pellets) (Figure 5). An earth impact berm lined with sandbags is located behind the firing lines. The entire pistol range area is approximately 220 feet by 200 feet. The pistol range was in operation between the early 1940s and 1993. According to Navy documents, types of weapons used at the pistol range included .22 caliber, .38 caliber, .45 caliber, 9mm, .357 caliber, .44 caliber, and 12 gauge shotgun. According to employee interviews, during the construction of the pistol range, excavation went to a depth of 8 feet to remove buried debris, i.e., fence material, aircraft engine parts etc. At the same time an unknown number of 55 gallon drums filled with fired 20mm projectiles were dumped in this excavation. These projectiles were also mixed into concrete (as aggregate) used for the pistol range foundations.

4.1.4 METALS CONTAMINATION

A 1995 soil investigation conducted by the Navy at the pistol range showed total lead, cadmium and zinc concentrations above California Total Threshold Limit Concentrations (TTLIC) (Title 22 CFR) of 1,000 mg/kg, 100 mg/kg, and 5,000 mg/kg, respectively.

4.2 SITE IR-2

The topography of Site IR-2 varies and is directly related to the site's previous use; the upland zones surrounding the wet areas were once a waste disposal area (as evidenced by the significant amount of debris) and the West Beach Landfill Wetland area was a former dredge spoils pond. An existing jogging trail is located at the outer edge of a bermed roadway that surrounds Site IR-2. The berm is approximately 10 - 15 feet higher in elevation than the rest of the site, with the upland zones as much as 5 feet higher in elevation than the West Beach Landfill Wetland area. The thick vegetation of the upland zones is dominated by thistles, *Brassica sp.* (mustard, turnip), coyote bush, and plantain. The wetland area contains standing water throughout most of the year and is dominated by pickleweed, saltgrass, seaside trefoil, and brass buttons. The wetland area is a haven for a variety of waterfowl including sensitive species and habitats such as the Caspian tern (*Sterna caspia*).

4.2.1 LOCATION AND CONSTRUCTION HISTORY

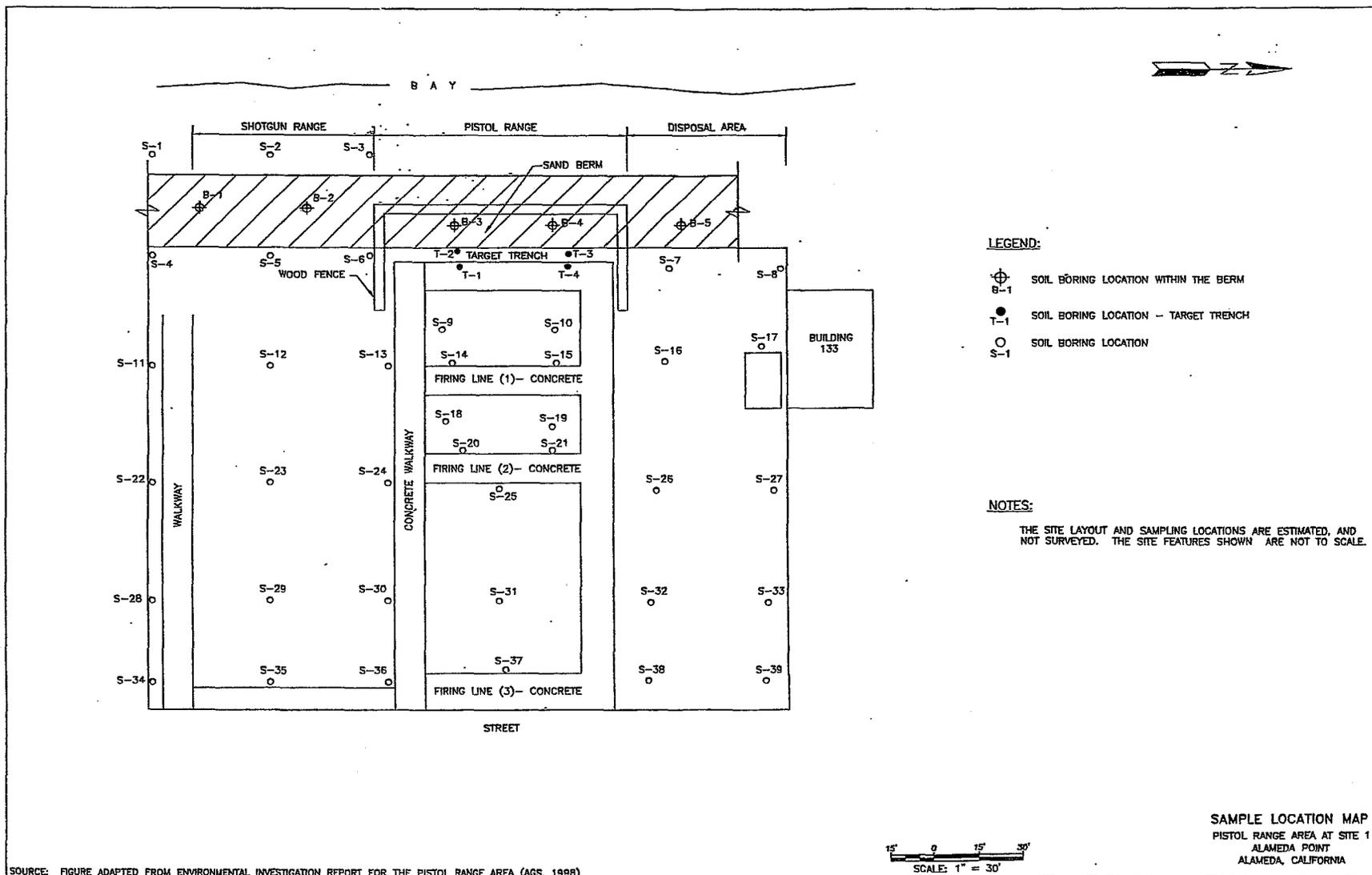
Site IR-2, the "West Beach Landfill" (Figure 3), served as the NAS Alameda disposal area from approximately 1952 through March 1978 (Figure 5), although most disposal of hazardous waste at the landfill had been eliminated by the late 1960s and early 1970s. Archival maps and drawings during the 1940s indicate the west beach landfill was 90% under water at high tide. As the size of the landfill increased, a breakwater

was installed around the site, allowing containment of dredge spoils. Some of these dredge spoils originated in the Seaplane basin and the berth and dock areas .

4.2.2 WASTE DISPOSAL HISTORY

An estimated 1.6 million tons of garbage and between 30,000 and 500,000 tons of hazardous waste was placed in Site 2. Hazardous wastes included PCBs, solvents, plating wastes, metals, pesticides, inert ordnance, low-level radiological waste, infectious waste, and acids. In 1976, 4 truck loads of inert ordnance ranging in size of 4 feet long and 12 inches wide to smaller ammunition, from the Defense Logistics Agency (DLA), Alameda, was buried in the landfill. A one time disposal of CS (o-Chlorobenzalmalonitrile) riot control agents (in containers as loose powder) from the 1968-1969 Berkeley student demonstrations was accomplished, with the exact location of the disposal area unknown.

FIGURE 5. PISTOL RANGE AREA AT SITE IR-1



SOURCE: FIGURE ADAPTED FROM ENVIRONMENTAL INVESTIGATION REPORT FOR THE PISTOL RANGE AREA (AGS, 1998)

SCALE: 1" = 30'

SAMPLE LOCATION MAP
PISTOL RANGE AREA AT SITE 1
ALAMEDA POINT
ALAMEDA, CALIFORNIA

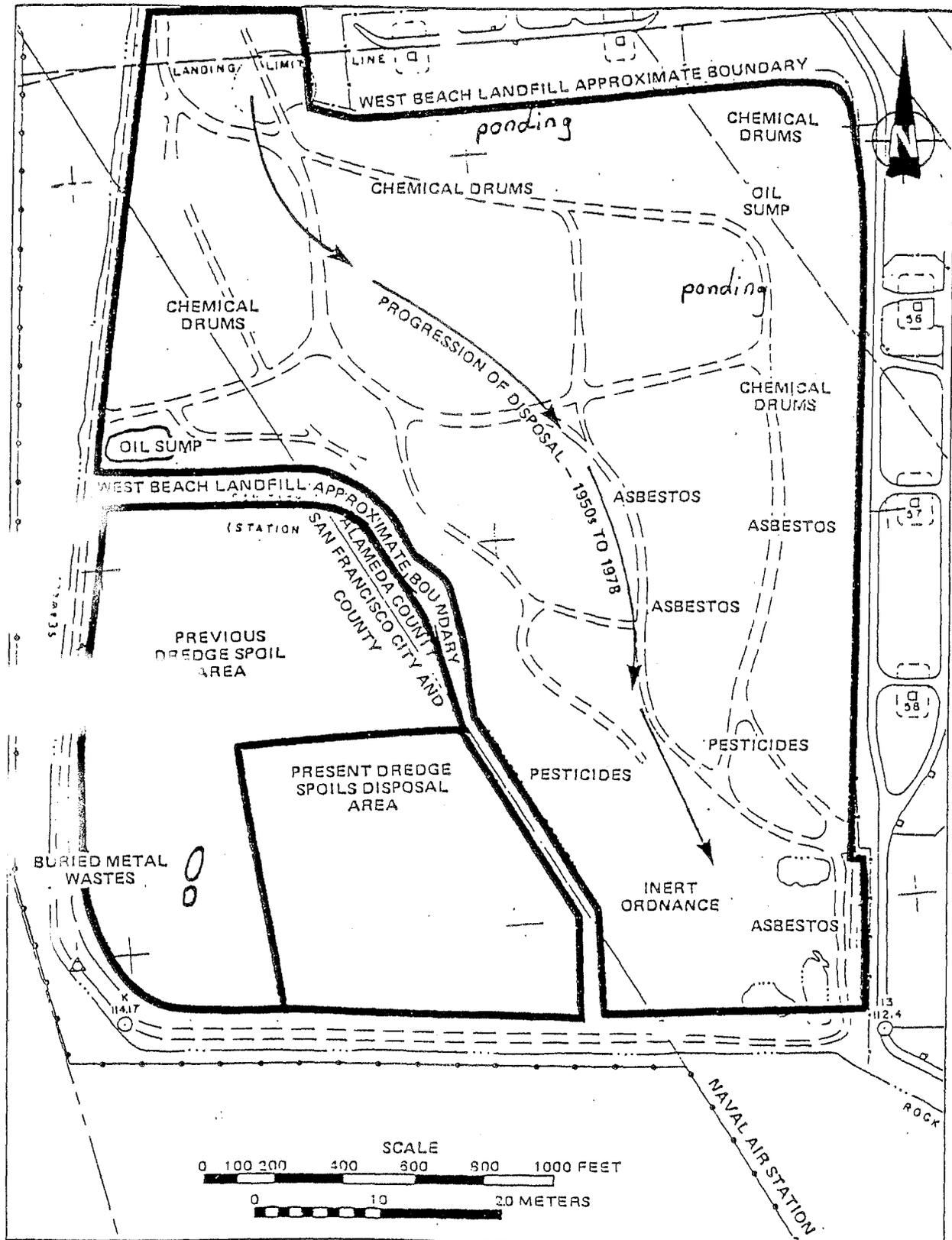


FIGURE 6. 1950-1978 WASTE DISPOSAL OPERATIONS

5. SITE WORK

This section describes the site work to be accomplished and the detailed field activities and procedures used to accomplish the tasks. There will be no intrusive operations during the conduct of this work plan.

Site work will include the following tasks:

- Debris Removal
- Survey Baselines
- Surface Search
- Geophysical Survey
- Data Recording and Mapping

5.1 DEBRIS REMOVAL

To facilitate the surface search and geophysical survey, ferrous metal debris on and near the surface will be removed by the survey teams, only as necessary and after an assessment of the relative danger of removing the debris has been made. Vegetation that may interfere with the surface search or geophysical survey will be trimmed as required to a minimum height of 4 inches to protect the natural habitat of the area. Should suspected hazardous waste be encountered, all work will be stopped and the Remedial Project Manager (RPM) immediately notified.

5.2 SURVEY BASELINES

In September 1997, SSPORTS Environmental Detachment survey personnel established baselines at Sites IR-1 and IR-2 to support the Radiological Survey of each site. The baselines were established from fixed primary reference points referenced to Building 133. Secondary reference points were established from the fixed primary reference points using conventional surveying techniques and will be used to develop the search grids. The method used to establish the secondary reference points and the baseline data are documented in survey logs that are controlled and maintained by the UXO Program Office at SSPORTS Environmental Detachment Vallejo.

5.3 SURFACE SEARCH

The purpose of the surface search is to visually locate, identify, and remove all exposed ordnance materials that may present a danger to site workers during the project. The surface search will utilize the pre-established baselines for both sites and a search grid system relative to the baselines (Figures 7 and 8). The search grids will be used to guide the survey teams, and act as a reference system for recording located ordnance materials and potential ordnance anomalies identified during the geophysical survey. The nominal size of each search grid will be 100 feet x 100 feet. The shoreline will determine the size of the grids located on the western-most edge of each site. The surface search along the shoreline will extend to, but not include the rip rap due to the dangers presented by the area. Tidal fluctuations will not affect the search of the grids along the shoreline.

AN FRANCISCO BAY

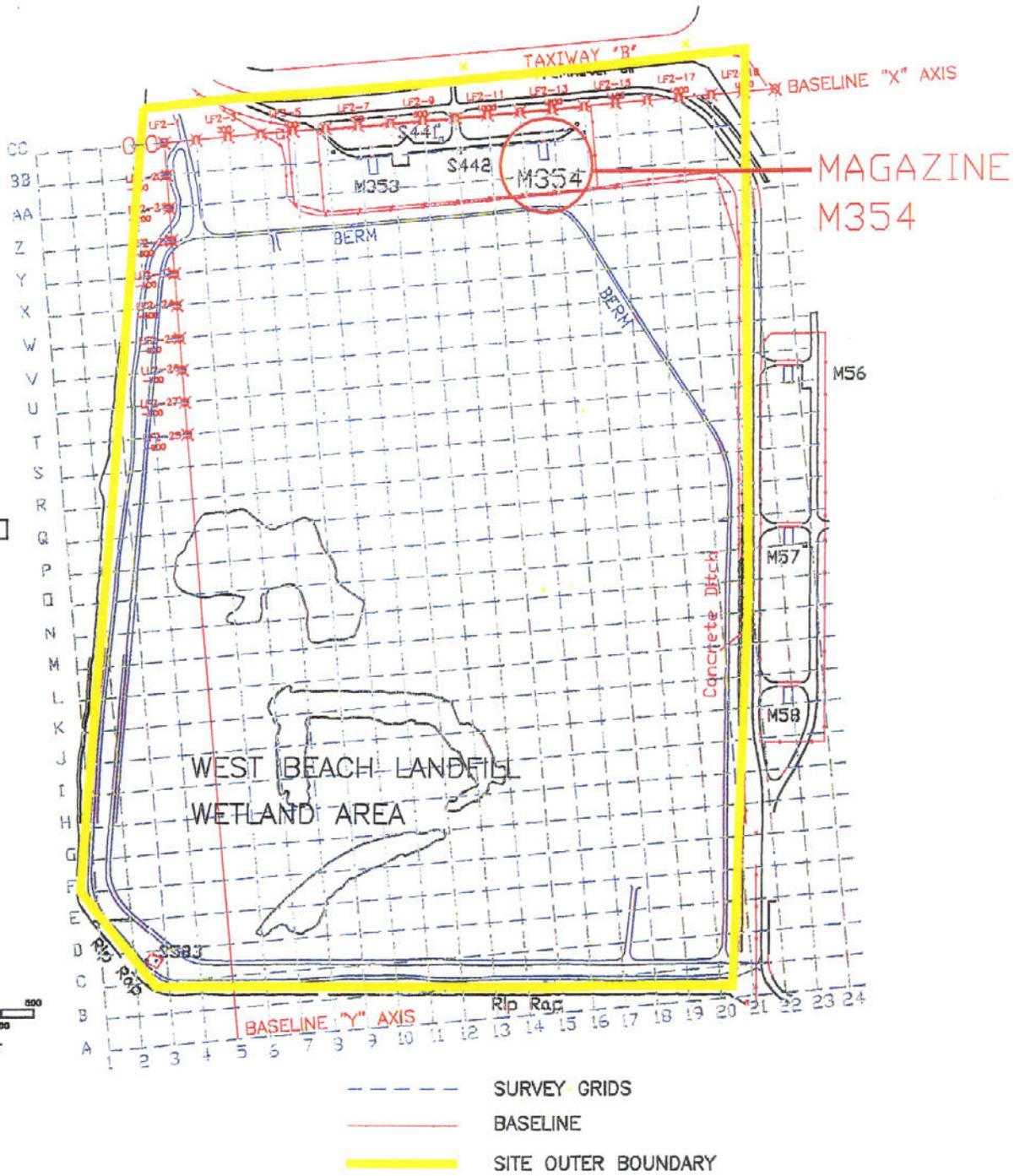


FIGURE 8. SITE IR-2 SURVEY BASELINES AND SEARCH GRIDS

A trained and qualified search team consisting of three UXO workers and a UXO Specialist from SSPORTS Environmental Detachment Vallejo will perform the surface search. The search team will begin the surface search from a specified location and walk the area at a search line separation of no more than 6 feet to ensure that all visible ordnance materials are located. Only visible ordnance and ordnance materials located on or near the surface will be recovered and no intrusive operations will be conducted. Since the extent of the potential UXO contamination is not known, the surface search will be extended to the outer site boundaries shown in Figure 3 and will not include the 8 acres previously searched during the October 1998 emergency removal action. All unexploded ordnance items are considered to be Department of Transportation (DOT) Hazard Class 1 Division 1 material unless determined otherwise by qualified UXO Specialists. Only qualified UXO Specialists will handle and remove ordnance items located during the site investigation.

If ordnance or suspected ordnance is located, the search team will stop and notify the UXO Specialist of the finding. The surface search will not continue until each item is inspected and evaluated by the UXO Specialist as being hazardous or non-hazardous. Ordnance found during the surface search that is considered hazardous will be handled and disposed of on-site by SSPORTS UXO Specialists in accordance with Standard Operating Procedure (SOP) No. 140, Immediate/Emergency Response On-Site Demolition Operation (reference 7). Hazardous ordnance items will be transported by the UXO Specialist to an on-site magazine for short term storage pending disposal in accordance with SOP No. 180 (reference 9). Reference 10 was submitted to the Naval Ordnance Center (NOC N7112) requesting the use of Magazine M354 as the on-site temporary storage for recovered UXO material during the site investigation at Alameda Point. Magazine M354 located near the landfill area (Figure 8), was previously sited for the storage of Class 1 Division 1 material prior to base closure, and was authorized by reference 11 for use during the 1998 emergency removal action.

Ordnance items that are not considered hazardous will be segregated, certified inert by the UXO Specialist and recycled or disposed of as scrap material. All ordnance items located by the search team will be marked and their position documented using a real-time differential global positioning system (DGPS).

5.3.1 DEFINING THE LANDFILL BOUNDARIES

During the surface search, the UXO Specialist will utilize a MK 26 magnetometer to define the landfill boundaries at Sites IR-1 and IR-2. The MK 26 is a standard Navy ferromagnetic magnetometer and will be used in accordance with the operating instructions contained in the operating manual. The MK 26 can detect a .50 caliber cartridge to a depth of approximately one foot. Larger objects, depending on its size and mass, can be detected to a depth of approximately 20 feet. The MK 26 will be calibrated before the start of each surface search in accordance with the operation manual and the sensitivity set at a level that will detect masses at the greatest possible depth without producing error signals. When an anomaly is located, the sensitivity of the instrument will be adjusted to allow for a more precise determination of the object's mass.

Significant contacts identified by the MK 26 magnetometer will be marked and recorded using real-time differential GPS (DGPS). The results of the surface search and information obtained from the review of historical data will determine which areas within Sites IR-1 and IR-2 warrant a more extensive geophysical survey.

5.4 GEOPHYSICAL SURVEY

Qualified surveyors will use the established baselines to develop the search grid parameters for the areas that require a geophysical survey. A typical search grid is 100' x 100' and uses a Cartesian coordinate system (x,y) with the search lanes spaced approximately 2 feet apart. The surveyors will walk each lane in a North-South direction and data will be collected at approximately 10 measurements per second at a walking pace of approximately 1 meter per second.

The geophysical survey will be accomplished using a Geometrics G-858 Portable Cesium Sensor Magnetometer in a gradiometer configuration. The G-858 magnetometer will be used in conjunction with the Trimble ProXR Real-Time Differential Global Positioning System (DGPS) to simultaneously acquire DGPS positions while acquiring magnetic data. The DGPS system will be connected to the magnetometer via an RS232 cable. The DGPS operator will walk behind the G-858 magnetometer operator at a distance that will not interfere with the magnetic data acquisition and influence or distort the magnetic data. Specific details of both instruments and their capabilities are described in Section 5.5, as well as the data processing and mapping software used to develop the final product.

The size and condition of the area to be surveyed will dictate the number of survey personnel required. Typically, the survey team will consist of four (4) surveyors: one magnetometer operator, one DGPS operator and two additional survey personnel to assist the instrument operators, as necessary, with navigation and other tasks.

5.5 DATA RECORDING AND MAPPING

A Trimble ProXR Real-Time Differential Global Positioning System (DGPS) will be used extensively to document the ordnance items located during the surface search and the significant subsurface anomalies identified by the MK 26 magnetometer while defining the landfill boundaries of each site. The Trimble ProXR will also be used during the geophysical survey to simultaneously collect DGPS positions while collecting magnetic data, and to record areas or items of interest, special features or attributes, and any other pertinent data that may impact or affect the final data analysis of the site. All DGPS data will be collected in U.S. State Plane NAD 83 coordinates, unless otherwise specified.

The Trimble ProXR utilizes Assett Surveyor software designed for fast and accurate real-time geographic data capture with sub-meter accuracy. The software operates the TDC2 data collector and communicates with the receiver to set specific DGPS parameters required for optimal accuracy, and to record DGPS positions to store on the TDC2 data collector. A Trimble 12-Channel Base Station will provide the differential corrections necessary to remove satellite measurement errors. The real-time data will

be post-processed with the differentially corrected data using Pathfinder Office software to provide even greater accuracy for mapping and navigational purposes.

During the geophysical survey, the Trimble ProXR will be connected to the Geometrics G-858 Cesium Sensor Magnetometer (via an RS232 cable) to simultaneously collect DGPS data while the G-858 is acquiring magnetic data. The collected DGPS data will be embedded with the magnetometer and other positioning data. The DGPS data will be extracted manually and post-processed with the differentially corrected satellite data from the Trimble 12-Channel Base Station. The post-processed DGPS data will then be re-merged with the G-858 magnetic data.

The Geometrics G-858 Cesium Sensor Magnetometer uses two portable cesium sensors in a gradiometer configuration and is capable of detecting very small ferrous and non-ferrous targets by measuring the magnetic flux density of the item. The sensors will be placed in a vertical array with the lower sensor approximately 30 cm (1 ft.) above ground level, with the upper sensor 1 meter (3.3 ft.) above the lower sensor. The basic magnetometer sensitivity is set to 0.05 nT (nanoTesla = 1 gamma). This system combines the speed and high sensitivity of the cesium magnetometers with the ease of an automatic data-recorder and microprocessor. The system stores up to five different data sets containing the magnetic data and other survey parameters and when used in a gradiometer configuration, automatically corrects for diurnal and time variations. The merged data collected by the G-858 and the DGPS will be downloaded and processed through MagMap96 post-processing software. The post-processed data can be graphically displayed on a computer screen as a Quality Control measure and assures coherence between the original acquisition parameters and the final locations.

A magnetic profile of the grids surveyed will be developed from the post-processed magnetic and DGPS data using Surfer® mapping and contouring software to produce high quality grid maps. Vector maps of the surveyed areas will also be generated using AutoCad® Version 14 software. The mapped data will be analyzed using MagAID software to assist with identifying the subsurface anomalies suspected to be UXO. MagAID is a target characterization software that interprets the results of the magnetic surveys and provides rapid analysis of multiple targets. The finalized data will be imported into a GIS using ArcView Version 3.1. This data can be used as a guide for determining the remediation remedy for the sites, if necessary.

GLOSSARY OF TERMS

ANOMALY - An object or area suspected to represent ordnance material because of historical evidence and/or physical characteristics such as location, magnetic signature, or other properties.

CALIBER - The diameter of a small arms projectile expressed in hundredths of an inch.

EXPLOSIVE - Chemical compound or mechanical mixture which, when subjected to heat, impact, friction, detonation or other suitable initiation, undergoes a very rapid chemical change with the evolution of large volumes of highly heated gases which exert pressures in the surrounding medium.

HIGH EXPLOSIVE - A substance that, once initiated, reacts with virtually instantaneous and continuous speed through the total mass, causing very high blast pressures and a widespread shattering effect.

INERT - The term used to describe ordnance that does not contain explosive material. Ordnance is considered to be live unless certified inert by competent authority (qualified Explosive Ordnance Disposal personnel).

ORDNANCE - Any device (or component of a device) which contains or is designed to contain explosive material. This includes propellant, projectiles, bulk explosive, primers, fuzes, small arms ammunition, pyrotechnics, etc.

ORDNANCE CONTAMINATION - Term describing the uncontrolled presence of ordnance items or components in an area. In the context of this work plan, the term does not imply chemical contamination of soil or structures attributed to explosive material (unless specifically stated).

STANDARD OPERATING PROCEDURE - A document which prescribes exact instructions for personnel to follow in performing a specific task involving explosives.

REFERENCES

1. Engineering Field Activity West Scope of Work, Ordnance Preliminary Assessment at Operable Unit 3, Alameda Point, Alameda, California dated 17 February 1999
2. Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA)
3. U.S. Army Corps of Engineers, Safety and Health Requirements Manual, Number EM 385-1-1
4. Navy Occupational Safety and Health Program Manual, OPNAVINST 5100.23E
5. Prevention and Treatment of Heat and Cold Stress Injuries Technical Manual, Navy Environmental Health Center Manual, NEHC-TM92-6
6. SSPORTS Environmental Detachment Radiological Survey at Alameda Point, Alameda, California, 28 September 1998
7. SSPORTS Environmental Detachment, Standard Operating Procedure (SOP) Number 140, Immediate/Emergency Response On-site Demolition Operation, dated 28 November 1998
8. Department of Defense Base Realignment and Closure (BRAC) Act of 1993
9. SSPORTS Environmental Detachment, Standard Operating Procedure (SOP) Number 180, Procedure for On-Base Handling, Transportation and Temporary Storage of Unexploded Ordnance at Operable Unit 3 Alameda Point
10. SSPORTS Environmental Detachment letter 5090 Ser 120/175 dated 22 Apr 99
11. NOC letter 8020 Ser N7112/720 dated 6 Nov 98
12. DOD 6055.9-STD, Ammunition and Explosives Safety Standards
13. OPNAVINST 11320.23, Firefighting Responsibilities and Authorities
14. DOD 4145.26M, DOD Contractors Safety Manual for Ammunition and Explosives



**OPERABLE UNIT (OU) 3
ALAMEDA POINT
ALAMEDA, CALIFORNIA**

**STANDARD OPERATING PROCEDURE
(SOP) NO. 180**

FINAL

May 2, 1999

Part 2 of the Unexploded Ordnance Survey Work Package

**SSPORTS ENVIRONMENTAL DETACHMENT
VALLEJO, CALIFORNIA**

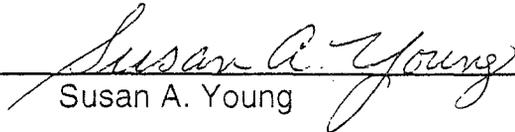
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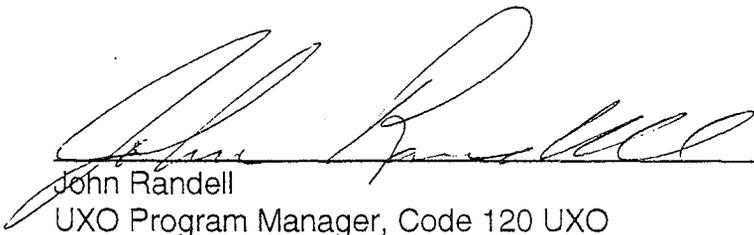
STANDARD OPERATING PROCEDURE (SOP) NO. 180
PROCEDURE FOR ON-BASE HANDLING, TRANSPORTATION AND
STORAGE OF UNEXPLODED ORDNANCE
AT OPERABLE UNIT (OU) #3
ALAMEDA POINT, ALAMEDA, CALIFORNIA

1. RECORD OF APPROVAL:

Prepared by: 
Susan A. Young

Date 5/3/99

SSPORTS Environmental Detachment Vallejo
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John Randell
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SSPORTS Environmental Detachment Vallejo

Date 5/3/99


Terry Epperson
Deputy Director, Code 120
SSPORTS Environmental Detachment Vallejo

Date 5/3/99

1.1 REVISION LISTING

Revision	Description	Approval	Date

4. STEP-BY-STEP PROCEDURES

4.1 REFERENCES

- a. 29 CFR Part 1910
- b. 40 CFR Parts 260-268 & 122-124
- c. 49 CFR Parts 172, 173, 178
- d. Explosive Ordnance Removal Training Matrix
- e. Unexploded Ordnance Survey Work Package, Operable Unit (OU) #3, Alameda Point, Alameda, CA
- f. NAVSEA OP 3861
- g. NAVSEA OP 4098
- h. NAVSEA OP 4461
- i. NAVSEA OP 5 VOL 1 Sixth Revision
- j. NAVSEA SWO20-AC-SAF-010/020/030
- k. NAVSEAINST 8023.11
- l. CSOMAREINST 8023.2
- m. Operation Manual MW 1630 (8/91)
- n. OPNAVINST 5102.1
- o. OPNAVINST 8023.2C
- p. CCR Title 22

4.2 PROCEDURE

This procedure provides step-by-step instructions for the safe handling, packaging and transportation of unexploded ordnance recovered during the UXO site investigation of Sites IR-1 and IR-2 at Operable Unit (OU) #3, Alameda Point, Alameda, CA. Based on the past history of the area, it is expected that ordnance materials will be recovered from the sites.

4.2.1 PREREQUISITES

- a. Ground surface must be conducive to safe operations.
- b. Shrubbery that would hinder easy movement or good visual access of the ground surface shall be removed.
- c. Code 120 UXO Specialists will provide explosive safety oversight and magnetometer/all-metals locator support for this procedure.

4.2.2 INITIAL PREPARATIONS

- a. The UXO Specialist will ensure appropriate equipment listed in Section 5 is available.
- b. The UXO Specialist will conduct a Type II Safety Brief. Team members will be briefed on the general and specific safety precautions of the evolution to be

performed. The Type II Safety Brief will be documented on the Safety Meeting Signoff Form (Appendix C of the HASP).

- c. Explosive Safety Quantity-Distance (ESQD) Safety Zones will be established (if hazardous ordnance is located), as shown in an example of an established ESQD zone, Figure 3 of the HASP.
- d. Recycling bins, trash bins and temporary ammunition containers for transporting Unexploded Ordnance will be placed in a location convenient to the area being cleared.
- e. The UXO Specialist will inspect each Team Member to ensure that they meet the following:
 - No silk, wool, rayon, nylon, or other synthetic-fiber outer or undergarments
 - Pair of leather palmed gloves
 - Adequate head protection from the sun
 - Safety shoes with no nails protruding from the soles nor steel toes exposed (instrument operators are exempt from wearing steel toe shoes)
 - One cotton canvas collecting bag in possession

4.2.3 HISTORY

The U.S. Navy conducted a remedial investigation (RI) from 1988 to 1995, with oversight from the California Department of Toxic Substances Control (DTSC), the San Francisco Bay Regional Water Quality Control Board (RWQCB), and the U.S. Environmental Response, Compensation and Liability Act CERCLA (EPA 1988a). As a result of these investigations, extensive radiological surveys were performed at Alameda Point. During a radiological survey of Site IR-1 conducted in September 1998, a number of 20mm high explosive projectiles were discovered. As a consequence of this, UXO Specialists from SSPORTS Environmental Detachment Vallejo conducted an emergency removal action on Site IR-1 (Figure 2). A total of 335 live 20mm high explosive projectiles and 2 live small arms cartridges (one .45 caliber ball round, and one .30 caliber ball round) were recovered during the removal action. Additional inert ordnance material recovered included 12,259 20mm projectiles, 1,686 .50 caliber armor piercing projectiles and 359 assorted brass cartridges. Also discovered during the preliminary surface sweep was a portion of the arming mechanism from a 40mm high explosive dual purpose (HEDP) grenade fuze together with the remains of electric blasting cap leads, packaging, and firing wire.

4.2.4 REMOVAL OF RECOVERED ORDNANCE

- a. If ordnance or suspected ordnance is located, the search team will stop and notify the UXO Specialist of the finding.
- b. The UXO Specialist will inspect, identify and evaluate the object. If the object is determined to be hazardous ordnance, the UXO Specialist will direct disposition in the following manner:

NOTE

IF THERE IS ANY QUESTION ABOUT THE CONDITION OF ANY ORDNANCE ITEM, IT WILL BE CONSIDERED "LIVE".

- 1) If the UXO Specialist determines that the object is considered safe to handle, the object will be packaged as described in paragraph 4.3. and transported to Magazine M354 (for temporary storage pending disposal) in accordance with paragraph 4.6. These items will not remain on the site overnight.
- 2) Those items considered unsafe to handle will be destroyed in place in accordance with Standard Operating Procedure (SOP) No. 140.

CAUTION

WHEN A DESTRUCTION IS BEING PERFORMED, ALL NON-ESSENTIAL PERSONNEL WILL EVACUATE THE SITE TO A DISTANCE OF AT LEAST 1250 FEET. NO ONE WILL RE-ENTER THE SITE UNTIL CLEARED BY THE UXO SPECIALIST.

- c. unexploded ordnance will be segregated, certified inert by the UXO Specialist, and recycled or disposed of as scrap material.
- d. Objects determined to be non-hazardous inert ordnance scrap and inert ordnance will be segregated by type (primer, cartridge case, etc.). The material will then be verified/certified inert, its condition documented by UXO Specialist in accordance with paragraph 4.5, and disposed of in accordance with paragraph 4.7.

4.2.5 DISPOSITION OF UNEXPLODED ORDNANCE

- a. UXO Specialists will direct the disposition of items containing energetic materials in the following manner:
 - 1) Those items considered safe to handle will be removed by the UXO Specialist. Items will be packaged as described in paragraph 4.3. and transported to Magazine M354 in accordance with paragraph 4.6. These items will not remain on the site overnight.
 - 2) Those items considered unsafe to handle will be destroyed in place in accordance with SSPORTS Standard Operating Procedure (SOP) No. 140.

NOTE

WHEN A DESTRUCTION IS BEING PERFORMED, ALL NON-ESSENTIAL PERSONNEL WILL EVACUATE THE SITE TO A DISTANCE OF AT LEAST 1250 FEET. NO PERSON WILL RE-ENTER THE SITE UNTIL CLEARED BY THE UXO SPECIALIST.

4.2.6 DISPOSITION OF ALL OTHER MATERIALS

- a. All non-ordnance scrap will be segregated and disposed of in accordance with paragraph 4.7.
- b. Inert ordnance scrap and inert ordnance will be segregated by type (primer, cartridge case, etc.). The material will then be verified/certified and its condition documented by the UXO Specialist in accordance with paragraph 4.5 and disposed of in accordance with paragraph 4.7.

4.2.7 RECORD KEEPING

- a. The UXO Specialist will make appropriate entries in the Master Clearance Log.

4.3 PROCEDURE FOR PACKING OF UNEXPLODED ORDNANCE

This procedure provides instructions for the packing of recovered unexploded ordnance. Packing under this procedure shall be considered adequate for transportation to Magazine M354 for short term storage pending disposal.

4.3.1 PREREQUISITE

Unexploded ordnance shall have been positively identified and segregated as to type and condition by the UXO Specialist.

4.3.2 INITIAL PREPARATION

The UXO Specialist shall ensure appropriate processing equipment listed in paragraph 5.2 is on site.

4.3.3 PROCESS FOR SMALL ITEMS

- a. Using items selected from paragraph 5.2, the UXO Specialist will line the bottom of ammunition can(s) with approximately three (3) inches of dry vermiculite or diatomaceous earth.
- b. Place either Small Arms or Primers neatly in ammo can(s) leaving room for approximately three (3) inches of dry vermiculite or diatomaceous earth on top.

- c. Fill remainder of container with dry vermiculite or diatomaceous earth and secure lid.
- d. Label and mark container appropriately for the enclosed ordnance material.

4.3.4 PROCESS FOR LARGER ITEMS

If large items are discovered, they will be packed in a manner consistent with all safety considerations and tailored to the individual ordnance item.

4.4 PROCEDURE FOR STORAGE OF UNEXPLODED ORDNANCE

This procedure provides instructions for the storage of Unexploded Ordnance in Magazine M354.

4.4.1 GENERAL REQUIREMENTS

- a. All unexploded ordnance to be stored must be packed and labeled in accordance with paragraph 4.3 of this SOP.
- b. Only magazines approved in accordance with reference (i) paragraph 11-1.2. are authorized for UXO storage.
- c. A placard specifying the explosive limits shall be posted or painted on either the inside front wall or inside the front door of the magazine. This placard shall have lettering at least 1-inch high and shall identify the maximum authorized quantity of explosives permitted in the magazine, by hazard class and division (in this case, 25 lbs Net Explosive Weight (NEW) for all classes and divisions). In addition, the General Safety Rules placard and a copy of this SOP shall be displayed in the general vicinity of the explosive limits.
- d. For the purposes of this SOP, the UXO Specialist is the designated Magazine Keeper.
- e. The Magazine Keeper shall maintain the magazine in accordance with reference (i). The Magazine Keeper is responsible for the following:
 - Maintain an up-to-date inventory of all material in the magazine
 - Ensure incompatible items are not stored in the same magazine in accordance with reference (i)
 - Good housekeeping
 - Immediately reporting to supervisory personnel any deficient condition of the magazine or its contents
- f. All UXO packaged in accordance with paragraph 4.3 of this SOP shall be stored on metal pallets.

- g. When personnel are working in the magazine, the magazine door shall remain open and a red flag shall be displayed prominently outside.
- h. The following actions are prohibited inside the magazine:
 - Smoking or the possession of any matches, cigarette lighters, or any other flame producing devices
 - Opening containers
 - Overpacking of containers
 - Storage of inert materials
 - Loitering
- i. The following actions are allowed in the magazine:
 - Inventory of containers
 - Palletizing containers incidental to storage or shipment

4.5 PROCEDURE FOR VERIFICATION/CERTIFICATION OF INERT ORDNANCE & INERT ORDNANCE SCRAP

This procedure provides instructions for verification and certification of inert ordnance and inert ordnance scrap.

4.5.1 PREREQUISITES

All items shall have been previously examined by the UXO Specialist and segregated during the appropriate removal process.

4.5.2 PROCEDURE

- a. All recovered ordnance materials shall be visually re-examined by a UXO Specialist for the presence of any explosive or reactive materials.
- b. The examination shall be 100% to include the opening of any closed compartments. However, it is not necessary to remove the expended primer from small arms shell casings.
- c. If, in the opinion of the UXO Specialist, it is not practical to make a 100% examination or there is the least suspicion of the presence of any explosive or reactive material, the item will be considered unexploded ordnance and handled in accordance with paragraph 4.2.5.
- d. A DD Form 1348-1 will be completed by the UXO Specialist as a turn-in document. Instructions for completion of this form are contained in the Defense Utilization and Disposal Manual, DOD 4160.21-M.

- e. The UXO Specialist making the final examination will sign the certificate as follows:

"I certify that the property listed herein has been inspected by me and, to the best of my knowledge and belief, contains no item of a dangerous nature."

4.6 PROCEDURE FOR ON-BASE MOVEMENT OF UNEXPLODED ORDNANCE

This procedure provides instructions for the loading, transporting, and unloading of recovered unexploded ordnance to Magazine M354 for temporary storage pending disposal.

4.6.1 PREREQUISITES

- a. The UXO Specialist shall ensure that all vehicle operators (if necessary) are licensed and certified in accordance with references (o) and (l).
- b. The UXO Specialist shall ensure that all equipment listed in paragraph 6.1 required for on-base movement is available.
- c. Unexploded ordnance shall be segregated by type, packed, and labeled in accordance with paragraph 4.3.

4.6.2 INITIAL PREPARATION

The UXO Specialist will conduct a Type II Safety Briefing using a Site Health and Safety Summary Sheet described in paragraph 6.1.2. An example of the Type II Safety Brief/Safety Meeting Signoff Form can be found in Appendix C of the Health and Safety Plan.

4.6.3 PROCEDURE

Due to the close proximity of Magazine M354 to Sites IR-1 and IR-2 (see Figure 8 of the Work Plan), the UXO Specialist will determine whether to hand carry the packed ammunition container to the magazine or transport it in an ordnance certified vehicle. Large ordnance items or larger quantities of recovered ordnance may require the use of an ordnance certified vehicle for transport to Magazine M354. For the purposes of this procedure, the UXO Specialist is the designated Magazine Keeper.

- a. Packed and labeled unexploded ordnance shall be placed inside ammunition containers and transported to Magazine M354 for temporary storage pending disposal. Only the UXO Specialist is authorized to hand carry the packed ammunition container to the magazine.

- b. If an ordnance certified vehicle is used to transport the recovered ordnance to the magazine, the driver of the transport vehicle will park on a level and stable site, turn off ignition, set handbrake, chock wheels, and dismount. If a pick-up truck is used, the tail-gate shall be lowered.
- c. The UXO Specialist shall open the outer security gate, raise the red 'BRAVO' flag. Magazine door shall remain shut at this time.
- k. The UXO Specialist and driver shall ensure vehicle is placarded on both sides, front and rear for Explosives Class 1 Division 1 and conforming to reference (c).
- l. After the UXO Specialist and transport vehicle driver are satisfied as to safe condition of load and proper condition of the vehicle, driver will remove tire chocks, start vehicle, release hand brake, and proceed directly to Magazine M354. No more than two people shall ride in the cab of the explosive laden vehicle in addition to the driver. No personnel shall ride in the cargo area of the vehicle.
- m. Upon arrival at Magazine M354, the UXO Specialist will assist in guiding the truck to the loading dock.
- n. Once in position, driver shall turn off the ignition, set parking brake, and install wheel chocks.
- o. At this time, the UXO Specialist shall open the magazine door.
- p. The driver and UXO Specialist shall unload and store the Unexploded Ordnance in accordance with paragraph 4.4.
- q. When all unexploded ordnance is unloaded and properly stored, the UXO Specialist shall secure the magazine door, lower the red 'BRAVO' flag, and all personnel and vehicles shall return to the work site.

4.7 PROCEDURE FOR DISPOSITION OF NON-ORDNANCE SCRAP, INERT ORDNANCE SCRAP, AND INERT ORDNANCE

This procedure provides instructions for final disposition of recyclable materials and trash recovered during the removal of unexploded ordnance from Sites IR-1 and IR-2 at Alameda Point.

4.7.1 PREREQUISITES

- a. Inert ordnance scrap and inert ordnance shall have been previously segregated and certified per paragraph 4.5 of this SOP.
- b. Recycling bins shall be provided at the site.
- c. A separate bin for non-recyclable trash shall be provided at the site.

4.7.2 PROCEDURE

- a. Every effort shall be made to segregate and reclaim as much recyclable material as possible.
- b. All recyclables shall be placed in the recycle bins.
- c. All non-recyclable, non-hazardous waste, shall be placed in trash bins.
- d. Hazardous wastes shall be handled per current RCRA requirements as applicable.
- e. The UXO Specialist is responsible for ensuring there is no mixing of recyclables and that no hazardous wastes are mixed with recyclables or trash.

5. EQUIPMENT LISTS

5.1 VEHICLES

- Truck, Van-Type, (Ordnance Certified)
- Truck, Pickup Utility (Crew Cab) 4WD

5.2 MATERIALS HANDLING & CONTAINERS

- Scrap Metal Bins
- Recycling Bins
- Dry Trash Bins
- Small Arms & 40mm Cans
- Metal Ordnance Pallets
- Packaging Materials
- Certified Tie-Down Strapping
- Sand Bags

5.3 COMMUNICATION

- Cellular Phone

5.4 MARKING SUPPLIES

- Wooden Stakes
- Spray Paint
- Ground Marking Paint

5.5 DOCUMENTATION

- Master Clearance Log
- Field Log Books

- DOT Hazard Labels and Placards
- Hazardous Waste Labels, Form 5090/12 (REV 12-90)

5.6 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Personal protective equipment (PPE) is discussed in Section 13 of the Health and Safety Plan.

6. HAZARDS, HAZARDS CONTROL, AND SAFETY BRIEFINGS

6.1 GENERAL

This section provides source documentation of all hazards and hazard control methods applicable to this SOP. This information provides the basis for two types of hazard control briefings.

- Type I:** All inclusive. Addresses the process and describes the hazards and control methods that the worker may encounter. This briefing will be conducted off-site, and is a prerequisite to personnel certification.
- Type II:** Addresses the operation and work area. Describes the hazards and control methods that the worker will encounter. This “stand-up” or refresher briefing will be given immediately prior to the initial commencement of any process covered by this SOP, any time there is a change in the SOP, and at least once a month.

6.1.1 TYPE I BRIEFING

The requirements of the Type I hazard control briefing shall be considered to have been fulfilled when all personnel shall read and have a thorough understanding of the procedures in this SOP. Each procedure will be practiced off-site, using inert materials until all members of the team are proficient in their execution. Documentation of proficiency shall be maintained by the Explosives Safety Office. In addition, all supervisory personnel shall complete Section 2 of this SOP, and workers shall complete Section 3. Copies shall be maintained at the Explosives Safety Office and on site.

6.1.2 TYPE II BRIEFING

The UXO Specialist shall accomplish the Type II or “stand-up” safety briefing. The UXO Specialist will assemble team members and brief on the general and specific safety precautions of the evolution to be performed. The Site Health and Safety Summary Sheet (Appendix D of the HASP) shall be used by the UXO Specialist to perform the Type II Safety Briefing. A record of this briefing will be prepared by the UXO Specialist using the Safety Meeting Signoff Form (Appendix C of the HASP).

7. EMERGENCY RESPONSE AND CONTINGENCY PLANS

This section provides emergency response procedures and contingency plans. Subjects include fire, minor injury, and serious injury.

7.1 RESPONSIBILITIES

- a. The UXO Specialist has overall responsibility and will ensure all necessary notifications are made.

NOTE

IN THE EVENT OF A SERIOUS INJURY, THE UXO SPECIALIST, OR SENIOR INDIVIDUAL PRESENT IF THE UXO SPECIALIST IS INJURED, WILL IMMEDIATELY ASSUME CONTROL OF THE SITUATION. THE FOLLOWING INFORMATION IS TO BE USED AS A GUIDE AND DOES NOT PRECLUDE COMMON SENSE DECISIONS THAT THE SITUATION MAY DEMAND.

- b. The UXO Specialist will:
 - (1) Designate personnel to administer emergency first aid as necessary.
 - (2) Designate personnel to assist if an ambulance or MEDIVAC is necessary.
 - (3) Provide the following information to the appropriate Emergency Services dispatcher:
 - (a) Type of injury.
 - (b) Number of personnel injured.
 - (c) Type of assistance requested

7.2 MINOR INJURY

NOTE

FOR THE PURPOSE OF THIS PROCEDURE, A MINOR INJURY IS ANY INJURY THAT IS NOT CONSIDERED LIFE THREATENING AND WILL NOT BE AGGRAVATED BY MOVEMENT OR TRANSPORTATION BY MEMBERS OF THE SEARCH TEAM.

- a. Injured personnel will be given emergency first aid.
- b. The UXO Specialist will ensure that injured personnel are transported (if necessary) to the nearest appropriate medical facility as quickly as possible.

7.3 SERIOUS INJURY

NOTE

FOR THE PURPOSE OF THIS PROCEDURE, A SERIOUS INJURY IS ANY INJURY THAT REQUIRES IMMEDIATE TRANSPORTATION TO THE CLOSEST MEDICAL FACILITY. THE DECISION TO REQUEST AN AMBULANCE OR MEDIVAC WILL BE MADE BY THE UXO SPECIALIST, OR SENIOR INDIVIDUAL PRESENT IF THE UXO SPECIALIST IS INJURED.

- a. Injured personnel will be given emergency first aid.
- b. Contact the local Emergency Services Dispatcher (usually 911 or a prearranged emergency number for the specific site).
 - (1) Explain the type of injury and number of personnel injured.
 - (2) Direct the responding units to a point just inside the ESQD arc.
 - (3) Direct one team member to meet the units and escort them to the site.
 - (4) An ambulance will transport injured personnel to the nearest medical facility.
 - (5) Contact the SSPORTS Explosives Safety Officer (707-562-3308/3310).
- c. If a helicopter MEDIVAC is required, request MEDIVAC assistance from the U.S. Coast Guard or Marine Band radio on channel 16..
- d. Complete reports as required by OPNAVINST 5102.1C.

7.4 FIRE FIGHTING

- a. The fire fighting equipment at the site consists of a fire extinguisher, two shovels, two burn blankets, one burn pack and a rake located inside the crew support vehicle.
- b. For fires that exceed these capabilities contact the local Emergency Services dispatcher. Do not continue to fight any fire once explosives have become involved.

7.5 HOSPITAL AND EVACUATION ROUTE

The closest medical facility to Site IR-1 and IR-2 at Alameda Point is Alameda Hospital. The hospital's location, directions to the hospital and the evacuation route are covered under Section 4 and Figure 1 of the Health and Safety Plan.

7.6 EMERGENCY RESPONSE GUIDELINES

Standard emergency procedures to be used by site personnel are described in the following sections. The On-Site Health and Safety Coordinator (OHSC), shall be notified of any site emergencies and is responsible for ensuring that appropriate procedures are followed.

- a. Following all site emergencies which require evacuation of the area, personnel shall not re-enter the area until:
 - (1) The condition(s) causing the emergencies have been corrected.
 - (2) Site Health and Safety Plan has been reviewed (and modified if necessary).
 - (3) Hazards have been reassessed.
 - (4) Site personnel have been briefed on any changes to the Site Health and Safety Plan.
 - (5) Emergency escape routes and safe areas have been identified and briefed prior to working a specific area. These routes and safe areas will be established by the OHSC and the UXO Specialist.

7.7 EMERGENCY RESPONSE PHONE NUMBERS

A cellular phone will be available on-site during all operations. The location and number of the nearest telephone will be determined for each specific site before the start of any site operations. Emergency response phone numbers are listed in Table 1 of the Health and Safety Plan.

7.8 ACCIDENT/INCIDENT REPORTING

- a. All injuries, accidents or near-misses shall be verbally reported to the SSPORTS OSHE Office immediately (same shift). A written accident/incident report must be prepared whenever an employee, contractor, or member of the public or military is injured or becomes ill due to exposure to chemical or physical agents (possibly exceeding federal or state regulations or the threshold limit values published by the American Conference of Governmental Industrial Hygienists) related to work at a hazardous waste site. The report will be prepared by the On-Site Health and Safety Coordinator in coordination with the Project Manager. Reports will be documented in accordance with OPNAVINST 5100.23D and report form EFA Contractor Significant Incident Report (CSIR-1) and will be prepared within 48 hours after the incident occurs. Reports are also required for "near misses" and minor injuries not requiring medical attention.
- b. The purpose of the reports is to determine and document the causes of incidents/accidents in order to prevent reoccurrence. The incident report is

distributed to the SSPORTS Explosives Safety Manager, the Detachment Director, and the Site Safety Officer. Completed incident reports are maintained by the SSPORTS Occupational Safety, Health and Environmental Office (OSHE).

- c. The accident/incident report must be prepared in addition to any reports required by the Defense Department, Navy, OSHA, or Worker's Compensation Insurance claims offices. The information contained in the incident report should be detailed enough to allow preparation of any additional required reports. The Project Manager will review the reports and institute any corrective measures required to prevent reoccurrence. The measures may include equipment or procedural changes, personnel retraining, or issuance of cautionary warnings to personnel.

Additional reporting requirements for incidents involving explosive ordnance are contained in Chief of Naval Operations Instruction (OPNAVINST) 5102.1, "Mishap Investigation and Reporting". Explosive Ordnance Mishap Reports will be prepared and maintained by the SSPORTS Explosive Safety Office.

8. SECURITY

This section provides security instructions for ordnance handling and removal operations on site.

8.1 HOURS OF OPERATION

- a. Ordnance handling and removal operations shall only be conducted during daylight hours.
- b. Normal working hours shall be from 7:30 to 11:30 AM and from 12:10 to 4:10 PM Monday through Friday. Shift adjustments may be made to suit schedule commitments.

8.2 SITE ACCESS

- a. During ordnance handling and removal operations, access to the site shall be restricted to those personnel whose names and signatures appear in Sections 2 and 3 of this SOP.
- b. A log shall be maintained at the site access gate. Log shall contain at a minimum the date, name, time of entry, and time of exit of each individual to the site.
- c. During explosive operations (if necessary) all roads crossed by the 1250 FT ESQD arc shall be barricaded and posted. Warning signs shall read:

**DANGER
NO ACCESS BEYOND THIS POINT
PHONE (707) 562-3310
FOR INFORMATION**

- d. When operations are complete for the day, barricades shall be removed and the site access gate secured by chain and padlock.
- e. Unauthorized personnel entering the site, or ignoring the barricades shall be immediately reported to the Alameda Point Police Department.

8.3 MAGAZINE SECURITY

- a. Access to Magazine M354 shall be limited to those approved by UXO Specialist who will maintain an access list and exercise control of the magazine keys in accordance with OPNAVINST 5530.13.
- b. Any discrepancies in the magazines shall be immediately reported to the SSPORTS Explosives Safety Officer at phone number (707) 562-3308.

8.4 MASTER CLEARANCE LOG

- a. A Master Clearance Log shall be maintained by the UXO Specialist assigned to the site.
- b. Entries in the Master Clearance Log may be transcribed from field log books, Daily Clearance Sheets, and other data collecting forms generated by activities on site. Corrections shall be made by drawing a single line through the incorrect information, dating, and initialing the correction.



**OPERABLE UNIT (OU) 3
ALAMEDA POINT
ALAMEDA, CALIFORNIA**

**UNEXPLODED ORDNANCE
HEALTH AND SAFETY PLAN**

FINAL

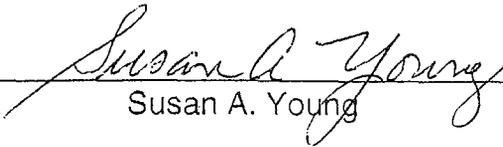
May 2, 1999

Part 3 of the Unexploded Ordnance Survey Work Package

**SSPORTS ENVIRONMENTAL DETACHMENT
VALLEJO, CALIFORNIA**

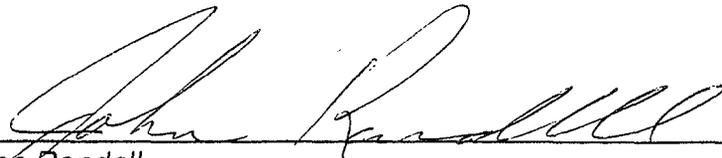
HEALTH AND SAFETY PLAN
UNEXPLODED SITE INVESTIGATION
OPERABLE UNIT (OU) 3
ALAMEDA POINT, ALAMEDA, CALIFORNIA

Review and Approval:

Plan Prepared by 
Susan A. Young

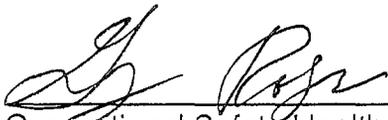
Date 5/3/99

SSPORTS, Environmental Detachment Vallejo
UXO Program Office, Code 120 UXO
Building A-216
Vallejo, CA 94592-0135



Date 5/3/99

John Randell
SSPORTS Environmental Detachment Vallejo
UXO Program Manager, Code 120 UXO



Date 5/3/99

Occupational Safety Health & Environmental (OSHE) Office
SSPORTS Environmental Detachment Vallejo



Date 5/3/99

Terry Epperson
SSPORTS Environmental Detachment Vallejo
Deputy Director, Code 120

REVISIONS

Revision	Description	Approval	Date

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**HEALTH AND SAFETY PLAN
UNEXPLODED ORDNANCE SITE INVESTIGATION
OPERABLE UNIT (OU) #3
ALAMEDA POINT, ALAMEDA, CALIFORNIA**

1. INTRODUCTION

This site specific Health and Safety Plan (HASP) establishes the responsibilities, requirements, and procedures for the protection of personnel performing the unexploded ordnance (UXO) surface search and geophysical survey of Installation Restoration Sites IR-1 and IR-2 at Operable Unit (OU) #3, Alameda Point, Alameda, California.

The Health and Safety Plan objectives, site description, planned field activities, and personnel responsibilities associated with this project are described in Sections 2, 5, 6, and 7 of this document. Sections 3, 4, 16, and 17 contain information relating to site first aid and emergency response procedures. The potential hazards related to site operations are discussed in Section 8. Sections 9 and 10 contain requirements related to the training (environmental and explosive safety) and medical surveillance of site personnel. Section 12 covers site control measures including the principles of Explosive Safety Quantity Distance (ESQD) and Hazards of Electromagnetic Radiation to Ordnance (HERO) as they relate to unexploded ordnance. Personnel protective equipment requirements, and decontamination and disposal procedures are discussed in Sections 13, 14, and 15. Safe work practices involving site staffing, the use of Standard Operating Procedures, etc., are contained in Section 14. Sections 18, 19, and 20 cover accident reporting, recordkeeping, and auditing requirements.

2. HEALTH AND SAFETY PLAN OBJECTIVES

The objective of this document is to establish requirements for ensuring a safe work environment, to provide a uniform and concise emergency plan of action, and to provide site workers with the necessary information to adhere to these policies. The programs and procedures contained in this document are based on the perceived site hazards. This HASP meets the requirements set forth by the following documents and agencies:

- ◆ Occupational Safety and Health Administration (OSHA) - 29 Code of Federal Regulations (CFR) 1910.120 Hazardous Waste Operations and Emergency Response, Occupational Safety and Health Standards
- ◆ OSHA 29 CFR 1926 Safety and Health Regulations for Construction
- ◆ U.S. Environmental Protection Agency (USEPA)
- ◆ Defense Department Explosive Safety Board (DDESB)
- ◆ Naval Sea Systems Command Ordnance Pamphlet (NAVSEA OP) 5 Volume 1, Safety Regulations for the Handling, Storage, Production, Renovation, and Shipping of Ammunition and Explosives Ashore
- ◆ U.S. Army Corps of Engineers, Safety and Health Requirements Manual, Number EM 385-1-1

This HASP has been prepared as a site-specific addendum to OPNAV Instruction 5100.23E, NAVY OCCUPATIONAL SAFETY AND HEALTH PROGRAM MANUAL, to comply with U.S. Navy environmental health and safety requirements.

3. EMERGENCY CONTACTS

Table 1 contains a summary of emergency phone contacts. All phone numbers will be verified prior to site work.

TABLE 1 - SUMMARY OF EMERGENCY CONTACTS

FIRE or EXPLOSION	Alameda Point Fire Dept. Sta. #5 (510) 749-5879 or 911
PERSONAL INJURY or EXPOSURE	Alameda Point Police Dispatch (510) 748-4508 Or 911
SSPORTS ENV DET VALLEJO EMERGENCY CONTACTS	John Randell, SSports Environmental Detachment UXO Program Manager, (707) 562-3308
	Terry Epperson, SSports Environmental Detachment Deputy Director, (707) 562-3205
	Rod Pieper, SSports Environmental Detachment Director (707) 562-3235
	Greg Rodgers/John Bouldt, SSports Environmental Detachment Health and Safety Office, (707) 480-7920/529-3963 (Cellular) or (707) 562-3245/3200
OTHER EMERGENCY RESOURCES	U.S. Coast Guard Emergency Response Team, (800) 424-8802
	Agency for Toxic Substances and Disease Registry (ATSDR), (404) 639-0700
	CHEMTREC, (800) 424-9300

4. HOSPITAL AND EVACUATION ROUTE

Figure 1 illustrates the route from Alameda Point to Alameda Hospital, the nearest medical facility located in downtown Alameda on the corner of Clinton Avenue and Willow Avenue.

The route begins from the East Access Gate to Sites IR-1 and IR-2 and proceeds to the hospital as follows:

- Exit the East Gate and turn right (going South) on Main Street
- Continue on Main Street to Central Avenue
- Follow Central Avenue to Encinal Avenue
- Follow Encinal Avenue to Willow Street
- Right on Willow Street and follow to Clinton Avenue

The local medical facility will be notified of the planned site activities and potential medical needs prior to the start of work at the site.

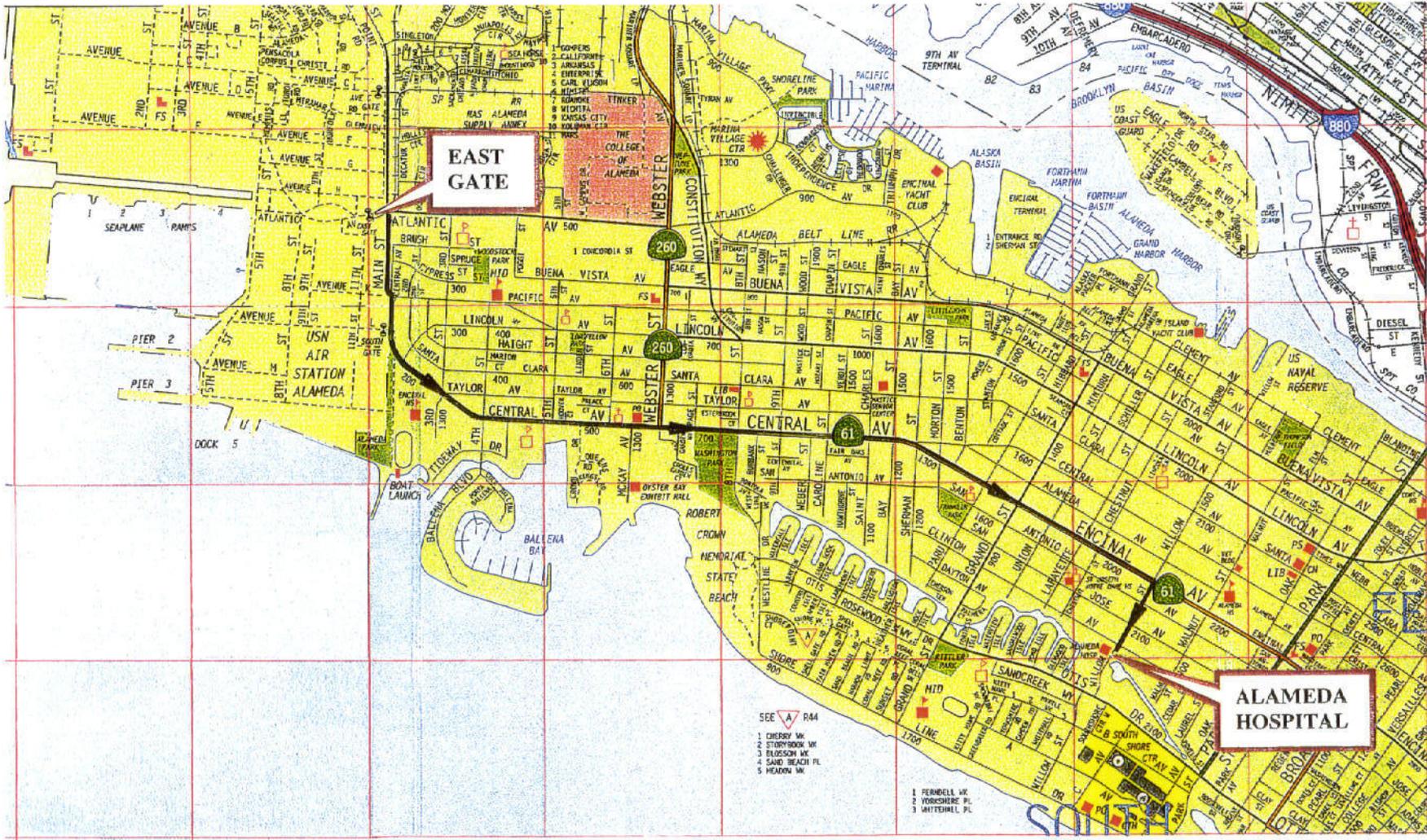


FIGURE 1. HOSPITAL ROUTE MAP

5. SITE DESCRIPTION

Alameda Point is located on the west end of Alameda Island, which lies on the east side of San Francisco Bay, adjacent to the City of Oakland. Alameda Point is rectangular in shape, approximately 2 miles long east to west, 1 mile wide north to south, and occupies 1,734 acres. (Figure 2). Sites IR-1 and IR-2 are located within Installation Restoration (IR) Operable Unit 3, at the north and southwestern corners of Alameda Point.

6. PLANNED FIELD ACTIVITIES

During a radiological survey of Site IR-1 conducted in September 1998, a number of 20mm high explosive projectiles were discovered. As a consequence of this, UXO Specialists from SPORTS Environmental Detachment Vallejo conducted an emergency removal action in October 1998 on Site IR-1. A subsequent surface survey of 8 acres, including the Pistol Range and adjacent areas, determined the potential for locating additional ordnance. A total of 335 live 20mm high explosive projectiles and 2 live small arms cartridges (one .45 caliber ball round, and one .30 caliber ball round) were recovered during the removal action. Additional inert ordnance material recovered included 12,259 20mm projectiles, 1,686 .50 caliber armor piercing projectiles and 359 assorted brass cartridges. Also discovered during the surface sweep was a portion of the arming mechanism from a 40mm high explosive dual purpose (HEDP) grenade fuze together with the remains of electric blasting cap leads, packaging, and firing wire.

The purpose of this site investigation is to perform a surface search of Sites IR-1 and IR-2 to visually locate UXO and determine the extent of the UXO present that could impact the selection of remedies for site remediation. Based on the results of the surface search and the information obtained from the historical data review, a geophysical survey will be conducted in selected areas to identify potential UXO anomalies that may be present at each site. There will be no intrusive investigations conducted during the surface search and geophysical survey.

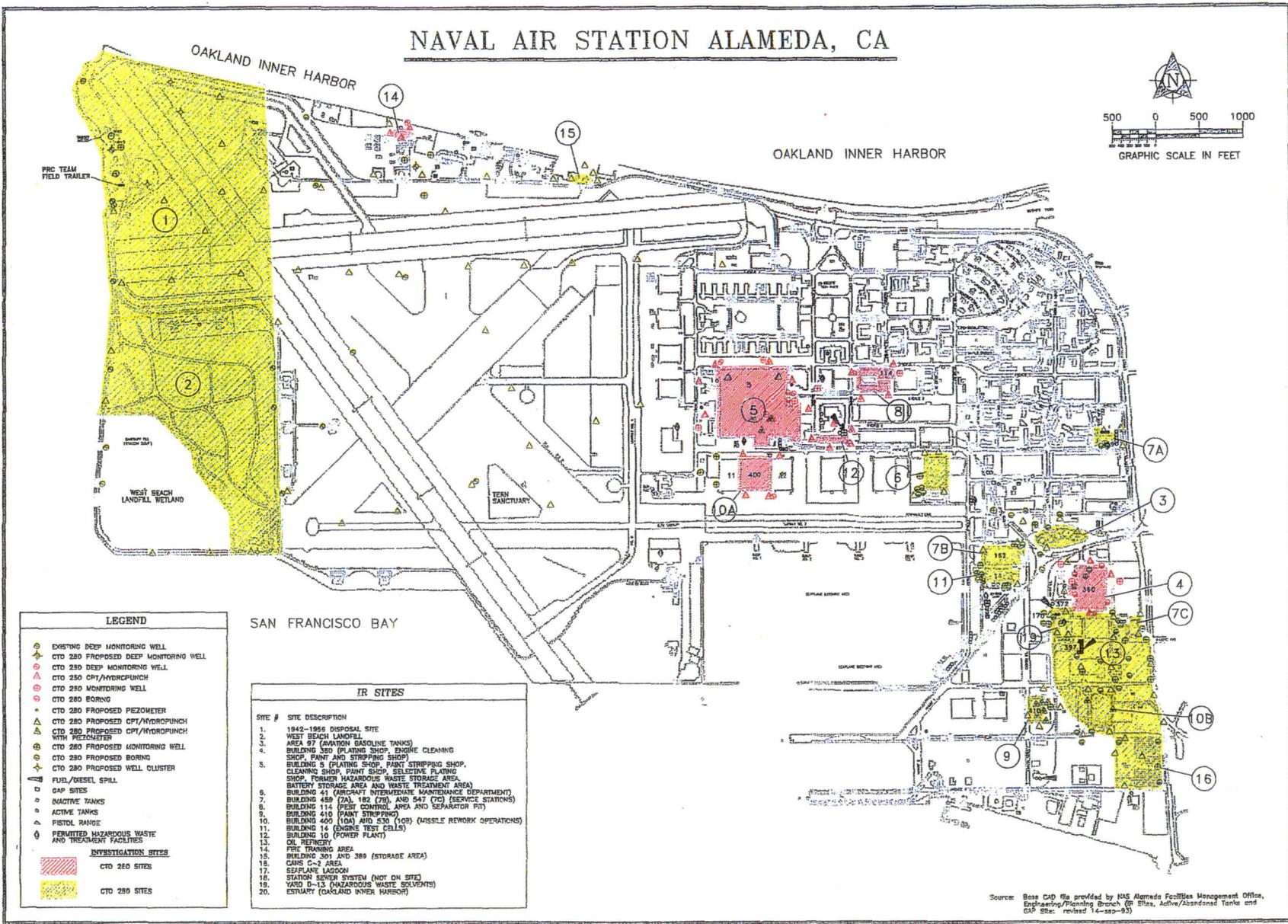


FIGURE 2. SITES IR-1 AND IR-2 LOCATION MAP

Source: Base CAD file provided by NAS Alameda Facilities Management Office, Engineering/Planning Branch, (R Sites, Active/Abandoned Tanks and GAP SRS; revised 14-sap-95)

Field activities will be accomplished in Level D personal protective equipment (PPE). The level of protection required for initial site entry is based on an assessment of known site data (see Section 8). The surface search and geophysical survey teams will withdraw from the site and immediately notify the Site Safety Officer should site conditions indicate a need to upgrade to a higher level of PPE. Work will resume only after appropriate PPE and safety procedures are reestablished that reflect the current site hazards. Descriptions of equipment and clothing required for Level D protection are provided in Section 13.

6.1 ORDNANCE LOCATION

Trained and qualified personnel and a UXO Specialist from SSPORTS Environmental Detachment will perform the surface search and geophysical survey in accordance with SSPORTS standard operating procedures (SOP). During the surface search, the UXO Specialist will utilize a MK 26 magnetometer to define the landfill boundaries at Sites IR-1 and IR-2. The geophysical survey will be accomplished using a Geometrics G-858 Portable Cesium Sensor Magnetometer in conjunction with a Trimble ProXR Real-Time Differential Global Positioning System (DGPS) to simultaneously acquire DGPS positions while acquiring magnetic data. No intrusive operations will be conducted during the surface search and geophysical survey. Only visible ordnance and ordnance materials located on or near the surface will be recovered during the surface search. If ordnance or suspected ordnance is located, the search team will stop and notify the UXO Specialist of the finding. Each item will be inspected and evaluated by a UXO Specialist as being hazardous or non-hazardous. Ordnance items located during the surface search and anomalies identified by the geophysical survey will be marked and their position documented using DGPS.

6.2 ORDNANCE REMOVAL

All unexploded ordnance items are considered to be Department of Transportation (DOT) Hazard Class 1 Division 1 material unless determined otherwise by qualified UXO Specialists. Only qualified UXO Specialists will handle and remove ordnance items located during the site investigation.

Ordnance items determined to be non-hazardous by the UXO Specialist will be segregated, certified inert and recycled. Ordnance items determined to be hazardous will be transported by the UXO Specialist to an on-site magazine for short term storage pending disposal in accordance with Standard Operating Procedure No. 140. A letter requesting the use of Magazine M354 as the on-site temporary storage for recovered UXO material at Alameda Point was submitted to the Naval Ordnance Center (NOC N7112) and is pending approval. Magazine M354 located near the landfill area (see Figure 3), was previously sited for the storage of Class 1 Division 1 material prior to base closure, and was authorized by for use during the 1998 emergency removal action.

6.3 DISPOSAL OF RECOVERED ORDNANCE

Ordnance items located during the surface search and determined to be hazardous will be treated on-site by SSPORTS UXO Specialists in accordance with SSPORTS SOP No. 140. Recovered live ordnance will either be treated in place or transported to an on-site magazine for short term storage pending treatment. All ordnance will be treated on-site by open detonation as an emergency removal operation since recovered ordnance is not considered safe to transport. A 1250 foot explosive safety quantity distance (ESQD) arc will be established around the site to allow the treatment of ordnance items up to 25 pounds net explosive weight (NEW) having a fragmentation distance of 1200 feet or less. ESQD requirements are discussed more thoroughly in Section 12. Access and traffic restrictions will be coordinated by the senior UXO Specialist during emergency removal operations.

6.4 MAPPING OF ORDNANCE LOCATIONS

A Trimble Differential Global Positioning System (DGPS) and Trimble 12-Channel Base Station will be used by qualified SSPORTS survey personnel to document the locations of all ordnance recovered during the surface search and subsurface anomalies identified during the geophysical survey.

7. PERSONNEL RESPONSIBILITIES

The duties and responsibilities of key project personnel with regard to health and safety are described below. Table 2 lists the personnel designated to accomplish specific job functions related to the site investigation.

- **Project Manager** is responsible for the overall planning, coordination, and safe accomplishment of all project work.
- **Site Safety Officer** determines basic policy regarding implementation of the site specific Health and Safety Plan.
- **On-Site Health and Safety Coordinator** represents the Site Safety Officer on a continuous basis at the work site and is responsible for ensuring conformance to all Health and Safety requirements.
- **Security Coordinator** is responsible for implementing security and Explosive Safety Quantity-Distance requirements with respect to site control and for insuring the proper qualifications of all personnel allowed into the work area.
- **Explosives Safety Manager** has overall responsibility for all aspects of explosive safety at Mare Island Naval Shipyard including those dealing with this project.

TABLE 2 - PERSONNEL RESPONSIBILITIES

POSITION (Note: one person may hold multiple positions)	PERSON(S)
SSPORTS Environmental Detachment Director (Code 100)	Rodney K. Pieper
SSPORTS Environmental Detachment OSHE Office (Code 100.1)	Greg Rodgers, John Bouldt
SSPORTS Environmental Detachment UXO Program Manager (Code 120 UXO)	John Randell
SSPORTS Environmental Detachment UXO Survey/GIS Manager (Code 120 UXO)	Susan Young
Site Safety Officer (Code 120 UXO)	Larry Maggini
On-Site H&S Coordinator	Rich Dekker
Security Coordinator	Rich Dekker
UXO Specialists (Code 120 UXO)	Rich Dekker
Explosives Safety Manager (Code 120 UXO)	John Randell
Data/Record Keeper	Rich Dekker, Susan Young
Visitors	TBD

All persons who perform work related to the location, removal, or treatment of ordnance and documentation of ordnance locations must be certified by the SSSPORTS Environmental Detachment Explosive Safety Manager as described in Section 9.

All persons who enter the site will be familiar with this site-specific Health and Safety Plan (HASP) and will sign the acceptance form (Appendix A). A feedback form is also provided in Appendix B for constructive comments regarding this document.

The On-site Health and Safety Coordinator (OHSC) will be responsible for ensuring that all personnel entering the work site comply with the HASP, meet the medical and training requirements, and have the required level of Personal Protective Equipment (PPE). Only explosive trained personnel certified by the SSSPORTS Explosive Safety Manager will be allowed to enter the work site. Daily site safety meetings will be held each morning before the start of work and workers will acknowledge their attendance by signing the safety meeting sign-off sheet (Appendix C). Accidents or incidents at the job site which affect or could potentially affect worker safety will be documented in accordance with OPNAVINST 5100.23E using an EFA Contractor Significant Incident Report (CSIR-1) form.

The OHSC shall establish the initial level of PPE and shall have the authority to upgrade or downgrade levels of protection at any time in response to field conditions. An updated Site Specific Health & Safety Plan Summary Sheet (Appendix D), prepared and reviewed by the OHSC and discussed at the daily site safety meeting, will detail the specific hazards, PPE requirements, etc. for each task. The OHSC shall also ensure that all personnel enter and leave active work areas through the decontamination station (if required) and shall be responsible for establishing communications with local health care providers and other agencies that may be tasked to provide support in an emergency.

8. HAZARD ANALYSIS

The following hazard review is based on information acquired from a search of historical data as well as from experience gathered during a previous investigative visit to the site. Historical information, visual inspection, and previous experience indicates a low hazard level since planned field activities do not involve intrusive operations.

Rules and procedures for the conduct of personnel during site operations are established to minimize exposure to explosive ordnance. These procedures require the cooperation of all workers and visitors to the site and will be strictly enforced by the OHSC. The OHSC shall establish the physical limits of the hazardous areas at the site and shall instruct all personnel and visitors on the boundaries of any exclusion zones and explosive safety quantity-distance arcs. Personnel should be aware of all potential chemical, physical, biological, ergonomic, and safety hazards associated with the project.

8.1 SITE HAZARD EVALUATION AND RISK ASSESSMENT SUMMARY

The following is a summary of anticipated site hazards:

Toxic vapors:	Yes	<u> X </u>	No	<u> </u>	Unknown	<u> </u>
Toxic dust:	Yes	<u> X </u>	No	<u> </u>	Unknown	<u> </u>
Explosion:	Yes	<u> X </u>	No	<u> </u>	Unknown	<u> </u>
Radiation:	Yes	<u> X </u>	No	<u> </u>	Unknown	<u> </u>
O ₂ Depletion/ Confined Space:	Yes	<u> </u>	No	<u> X </u>	Unknown	<u> </u>
Buried Utilities:	Yes	<u> X </u>	No	<u> </u>	Unknown	<u> </u>
Physical Hazards:	Yes	<u> X </u>	No	<u> </u>	Unknown	<u> </u>

The principle hazards are expected to be from unexploded ordnance and from other physical hazards related to the work site. The most critical safety precaution relating to ordnance and explosives is to minimize personnel exposure by minimizing the number of workers exposed, the duration of exposure, and the degree of hazard. Table 3 details the specific hazards for each planned field activity.

TABLE 3 - HEALTH & SAFETY SUMMARY

FIELD ACTIVITY	SPECIFIC HEALTH & SAFETY HAZARDS ANTICIPATED					
	CHEMICAL	PHYSICAL	BIOLOGICAL	ERGONOMIC	EXPLOSIVE	OTHER HAZARDS
SURFACE SEARCH	lead cadmium zinc	slipping, tripping, falling, heat stress, cold stress, weather	insects, standing water organisms, animals, irritating plants	fatigue, search instruments	ordnance items	lightning radiological
REMOVAL OF ORDNANCE	particulate dust	slipping, tripping, falling, heat stress, cold stress, weather	insects, standing water organisms, animals, irritating plants	fatigue	ordnance items	lightning radiological
ORDNANCE DISPOSAL	particulate dust	slipping, tripping, falling, heat stress, cold stress, weather	insects, standing water organisms, animals, irritating plants	fatigue	electro- explosive devices, demolition explosives, ordnance items	lightning RF energy static electricity
GEOPHYS. SURVEY	lead cadmium zinc	slipping, tripping, falling, heat stress, cold stress, weather	insects, standing water organisms, animals, irritating plants	fatigue, search instruments	ordnance items	lightning radiological
RECORDING ORDNANCE LOCATIONS	none	slipping, tripping, falling, heat stress, cold stress, weather	insects, standing water organisms, animals, irritating plants	fatigue, survey equipment	none	lightning radiological

8.2 CHEMICAL HAZARDS

The historical data review revealed that between 30,000 and 500,000 tons of hazardous waste was placed in Site IR-2 between 1952 through 1978, although most disposal of hazardous waste at the site had been eliminated by the late 1960s and early 1970s. A 1995 soil investigation conducted by the Navy at the pistol range showed total lead, cadmium and zinc concentrations above California Total Threshold Limit Concentrations (TTLC) (Title 22 CFR) of 1,000 mg/kg, 100 mg/kg, and 5,000 mg/kg, respectively.

The risk of exposure to any chemical hazards is expected to be low, since no intrusive operations are involved in any of the planned field activities at the work site. If any chemical contamination is suspected or encountered during the surface search or geophysical survey, all work will stop and the RPM immediately notified of the situation.

8.3 PHYSICAL HAZARDS

The anticipated physical hazards are related to the nature of the work and to the site conditions and activities. Work at this site may involve exposure to the following physical hazards:

- Slipping, tripping, or falling
- Cold and heat stress
- Excessive noise

Hearing protection will be required during demolition operations when the sound level may exceed 84 dBA (decibels on the A-weighted scale) or 140 decibels regardless of duration. The A-weighted decibel scale designates the response characteristic of a sound level meter representing the frequencies most damaging to human hearing.

Injuries resulting from physical hazards can be avoided by adopting safe work practices and being aware of the conditions presented by the work site. The Site Safety Officer will ensure that workers are kept informed of potential physical hazards related to the site.

8.4 BIOLOGICAL HAZARDS

Biological hazards at the site include insects, standing water organisms, animals, and irritating plants.

Ingestion or contact with standing water organisms (bacteria, parasites, etc.) may result in injuries ranging from skin irritation to severe gastrointestinal distress. Normal precautions taken to reduce contact with chemical contaminants, such as the use of protective clothing and good personal hygiene, are also effective against these organisms.

Animal bites or insect stings are usually nuisances (localized swelling, itching, and minor pain) that can be handled by minor first aid treatment. The bites of specific snakes, lizards, and spiders contain sufficient poison to warrant medical attention. The greatest hazard from animal and insect bites is sensitivity reaction. Shock due to a sting can lead to severe reactions in the circulatory, respiratory, and central nervous systems and can result in death. Persons who are allergic will be required to carry their prescribed treatment and notify the OHSC where it is located. Anyone stung or bitten will be required to stop work and be observed for signs of allergic reaction. Insect repellent will be used to reduce the effects of the mosquitoes, ticks, and other insects at the site.

Direct contact with plants which produce adverse effects may result in dermatitis and inflammation of the skin. Protective clothing and thorough washing after exposure will reduce the exposure risk from plant toxins.

8.5 ERGONOMIC HAZARDS

Site operations will involve a large amount of physical labor to locate and remove ordnance items. Fatigue and extensive use of instruments may comprise the principle ergonomic hazards. Caution should be exercised when lifting, pulling, bending, etc. to reduce the potential for back related injuries.

8.6 EXPLOSIVE HAZARDS

The risk to site workers can be minimized by rigid compliance with the methods and procedures detailed in the work plan and established SSPORTS procedures. Recovered live ordnance will be treated in place (as determined by the UXO Specialist) or transported to an on-site magazine for short term storage pending treatment in accordance with SSPORTS Standard Operating Procedure (SOP) Nos. 140 and 180. No smoking or other flame producing activities or devices will be allowed at the site.

8.7 RADIOLOGICAL HAZARDS

The risk of radiological exposure to site personnel is not expected since the planned field activities are non-intrusive and will not expose a radiation area. In accordance with NAVSEA 0288 (Radiological Controls for Shipyards) and Radiological Affairs Support Office, U.S. Navy, a radiation area is defined as an area where an individual can receive greater than 1 mRem/hour whole body exposure. No such area is known to exist at Sites IR-1 and IR-2; therefore, personnel performing the surface search and geophysical survey are not expected to be at risk and do not require radiological monitoring.

8.8 OTHER SAFETY HAZARDS

During inclement weather, electrical storms occur occasionally and the resultant lightning may pose a serious safety hazard to field personnel. Work shall be stopped and the site evacuated when lightning is present within three miles of the site.

9. TRAINING REQUIREMENTS

Because of the nature of planned work, training requirements involve explosive safety as well as environmental safety subjects. All personnel performing actions related to the location, neutralization, removal, handling, packaging, storage, transportation, or disposal of Unexploded Ordnance (UXO) material must be trained and certified by the SSPORTS Explosive Safety Manager as described in the following sections. Copies of training certificates for all site workers are maintained at the SSPORTS UXO Program Office.

All persons entering the site will be required to read this HASP and sign the compliance agreement form. A briefing will be presented by the OHSC to all persons before they enter the site. The following topics will be addressed during the briefing:

- Names of the Site Safety Officer, OHSC, and designated alternates
- Site history
- Hazardous chemicals that may be encountered during on-site activities
- Explosive hazards that are known or suspected to exist at the site.
- Physical hazards that may be encountered during on-site activities
- Training requirements
- Levels of protection to be employed for work tasks
- Work tasks
- Environmental surveillance requirements
- Action levels and identification of situations requiring an upgrade or downgrade in levels of protection
- Site control measures, including site control zones, communications, and safe work practices
- Emergency communication signals and codes
- Personnel exposure and accident emergency procedures (in case of exposure to hazardous substances, falls, and other hazardous situations)
- Fire and explosion emergency procedures
- Emergency telephone numbers
- Emergency routes
- Any other health and safety-related topics that may arise before on-site activities begin

Issues that arise during implementation of on-site activities will be addressed during daily "tailgate" safety meetings held each morning. Any changes in procedures or site-specific health and safety-related matters will be addressed at these meetings. Site workers will be required to sign the Safety Meeting Sign-off Sheet (Appendix C).

9.1 ENVIRONMENTAL HEALTH AND SAFETY

All personnel entering the site will be required to meet the training requirements outlined in OSHA 29 CFR 1910.120 involving hazardous waste operations and emergency response. Emergency response personnel are exempt from this requirement in accordance with references 12 through 14 of the Work Plan.

Environmental training required by the Explosive Ordnance Removal Training Matrix (maintained by the Explosive Safety Manager) includes those courses listed below.

- Health and Safety for Hazardous Waste Workers
- Hazardous Waste Policies and Procedures
- Respiratory Protection
- Site Supervisor Training
- Naval Hazardous Material Driver
- Transportation of Hazardous Material
- Transportation of Hazardous Material for Supervisors

9.2 EXPLOSIVE SAFETY

SSPORTS UXO Specialists performing the location and removal of ordnance are required to be graduates of the Navy Explosive Ordnance Disposal School and have a military EOD background. All persons entering the site (with the exception of emergency response and EOD personnel) will be trained and certified by the SSSPORTS Explosives Safety Manager in accordance with the requirements of Engineering Field Activity West Caretaker Site Office Mare Island Instruction 8020.2, Non-nuclear Ordnance and Explosive Handling Certification Program. Explosive Safety training will be in accordance with the Explosive Ordnance Removal Training Matrix (maintained by the Explosive Safety Manager) and includes those courses from the following list applicable to the worker's function and responsibilities.

- Basics of Explosive Hazard Control
- Explosive Safety for Managers and Supervisors
- Explosive Safety Risk Management and Hazardous Waste Management
- Electrical Explosive Safety for Naval Facilities
- Naval Motor Vehicle and Railcar Inspection
- Safety Procedures for Ordnance Handling

10. MEDICAL SURVEILLANCE

The following sections describe the medical surveillance program requirements for site workers, including health monitoring, documentation and recordkeeping, and medical support and follow-up.

10.1 HEALTH MONITORING

All site personnel must participate in a health monitoring program as required by OSHA 29 CFR 1910.120(f) and Title 8, CCR5192 (f)(2) and (3). Medical examinations and consultations by a board-certified occupational medicine physician will be provided prior to assignment, at termination, and under certain conditions of reassignment. Medical examination and consultation with a physician at the Occupational Medicine Department Branch Medical Clinic at Concord Naval Weapons Station will be made available to employees as soon as possible upon notification that the employee has developed signs or symptoms indicating injury, possible overexposure to hazardous substances or health hazards, or exposure above the permissible exposure limits.

The medical examination and consultations will also be available to employees at more frequent intervals if the examining physician determines that an increased frequency of examination is medically necessary. SSSPORTS has a health monitoring program established with the Concord Branch Medical Clinic. Personnel will receive annual physical examinations under this monitoring program in accordance with the Department of the Navy Bureau of Medicine and Surgery Medical Surveillance Procedures Manual and Medical Matrix Technical Manual NEHC-TM91-5 (Sept 1991 or later). Examinations will consist of the following:

- A baseline medical examination that includes the following:
 - Completion of a personal, family, and environmental history questionnaire
 - Physical examination
 - Vision screening
 - Laboratory testing
 - Audiometric screening
 - Pulmonary function test
 - Resting electrocardiogram
 - Chest x-ray (required once every 3 years)
- A complete blood count that includes the following:
 - White blood count
 - Red blood count
 - Hemoglobin test
 - Hematocrit test
 - Liver function test
 - Kidney function test
 - Lipid metabolism test
 - Carbohydrate metabolism test
- A urinalysis that includes the following:
 - Sugar content test
 - Albumin content test
 - Specific gravity test
- Laboratory chemistries appropriate for any specific site contaminants determined by field sampling to be a concern to worker health and safety

After laboratory tests have been completed, the examining physician will prepare a written opinion that will be documented in Medical Clinic records and the Medical Qualification database in accordance with 29 CFR 1910.120(f)(7). A letter will be issued to the employee and to the employee's organization containing the following information:

- The physician's opinion as to whether or not the employee has any medical conditions that would place the employee at an increased risk of health impairment from work in explosive handling operations, hazardous waste operations, or during an emergency response.
- Recommended limitations, if any, upon the employee's assigned work. Special emphasis is placed on fitness for duty, including the ability to wear any required PPE under conditions expected on-site.
- A statement that the employee has been informed by the physician of the medical examination results and of any medical conditions that require further examination or treatment.

10.2 DOCUMENTATION/RECORDKEEPING REQUIREMENTS

The Occupational Medicine Department Branch Medical Clinic at Concord Naval Weapons Station will maintain medical surveillance records in compliance with 29 OSHA CFR 1910.120(f) for SSPTS employees performing hazardous waste site activities. Copies of medical clearances for all site workers will be maintained at the site. Site visitors will be required to provide records in compliance with OSHA 29 CFR 1910.120(f) before entering the site.

The Health and Safety Office Head will be responsible for recording and reporting near-misses, accidents, illnesses, and injuries involving employees in accordance with 29 CFR 1910/1926 (OSHA) and U.S. Navy requirements. An EFA Contractor Significant Incident Report (CSIR-1) will be completed by the OHSC, assisted by the Site Safety Officer. A copy of this completed report will be added to SSPTS medical surveillance records in the event of a reportable accident, illness, or injury.

11. ENVIRONMENTAL SURVEILLANCE

This section discusses procedures for monitoring the site environmental conditions which may be factors in the site investigation.

Heat stress is not expected to be a factor for this project since planned field activities do not require excessive labor to perform the surface search or the geophysical survey of the selected areas.

Air monitoring is not expected to be a factor for this project since planned field activities are not intrusive. However, if contaminants are suspected or any unusual conditions encountered during the surface search and geophysical survey that may be cause for concern, all work will be stopped and the RPM immediately notified of the situation.

Noise monitoring will not be accomplished since there are no tools, other than the survey instruments, required for site work. Workers may be exposed to harmful levels of noise during demolition operations to treat recovered ordnance. Site personnel will be required to wear double hearing protection during demolition operations (ear inserts and ear muffs).

11.1 COLD STRESS MONITORING

Cold stress due to inclement weather and windy conditions may be a factor and monitoring shall be per NEHC 92.6. The following paragraphs describe forms of cold stress, conditions under which cold stress may occur, and preventative measures.

The effects of cold stress may range from numbness and tingling of the extremities to frostbite and possible death caused by lowering of the body's core temperature. Pain in the extremities may be the first early warning of danger from cold stress. A core temperature of 96.8°F is the lower limit for normal exposure; lower temperatures will result in reduced mental alertness, reduction in rational decision making, or loss of

consciousness with the threat of fatal consequences. Maximum severe shivering which develops when the body temperature has fallen to 95°F should be taken as a danger sign that cold exposure should be immediately terminated.

Ambient temperatures and wind velocity influence the development of cold injuries. Wind chill (the chilling effect of moving air) should be taken into consideration along with the air temperature when determining safety requirements for outdoor work. Table 4 illustrates the effect that wind velocity has on actual versus equivalent temperature.

TABLE 4. COOLING EFFECT OF WIND ON EXPOSED FLESH

Estimated Wind Speed in miles/hour (MPH)	Actual Temperature Reading (°F)					
	50	40	30	20	10	0
	Equivalent Chill Temperature (°F)					
CALM	50	40	30	20	10	0
5	48	37	27	16	6	-5
10	40	28	16	4	-9	-24
15	36	22	9	-5	-18	-32
20	32	18	4	-10	-25	-39
25	30	16	0	-15	-29	-44
30	28	13	-2	-18	-33	-48
35	27	11	-4	-20	-35	-51
40	26	10	-6	-21	-37	-53
(Wind speeds greater than 40 mph have little additional effect)	Little danger in less than 1 hour with dry skin. The maximum danger is from a false sense of security.					Increasing danger from freezing of exposed flesh within one minute
Trench foot may occur at any point on this chart.						
Source: Modified from ACGIH, 1994						

When protective outer clothing is removed and the clothing underneath is perspiration-soaked, the body cools very rapidly. Workers should therefore avoid removing equipment until they are in a warm area. Thermal socks, long cotton or thermal underwear, hard-hat liners, and other cold-weather gear should be used to prevent hypothermia when the air temperature is below 40°F. Blankets, warm drinks (other than caffeinated coffee), and warm rest are also essential in preventing or reducing the effects of cold stress. Multilayered clothing, including a wind resistant outer layer, is especially effective in reducing the effects of cold weather.

When symptoms of cold stress are noted (shivering, excessive fatigue, drowsiness, etc.) workers are encouraged to stop work and relocate to a heated shelter. Warm beverages should be consumed during breaks to maintain fluid volume and prevent dehydration, which may increase the susceptibility of the worker to cold injuries.

Depending on the degree and nature of possible cold stress, consultation with an industrial hygienist may be appropriate. Additional applicable cold stress control actions will then be determined by the OHSC based on the evaluation.

12. SITE CONTROL

The following sections describe the site control measures required to ensure site security and prevent public exposure. The site restrictions imposed by Naval Sea Systems Command Ordnance Pamphlet (NAVSEA OP) 5 Volume 1 concerning Explosive Safety Quantity Distance (ESQD) arcs are also discussed.

12.1 SITE CONTROL ZONES

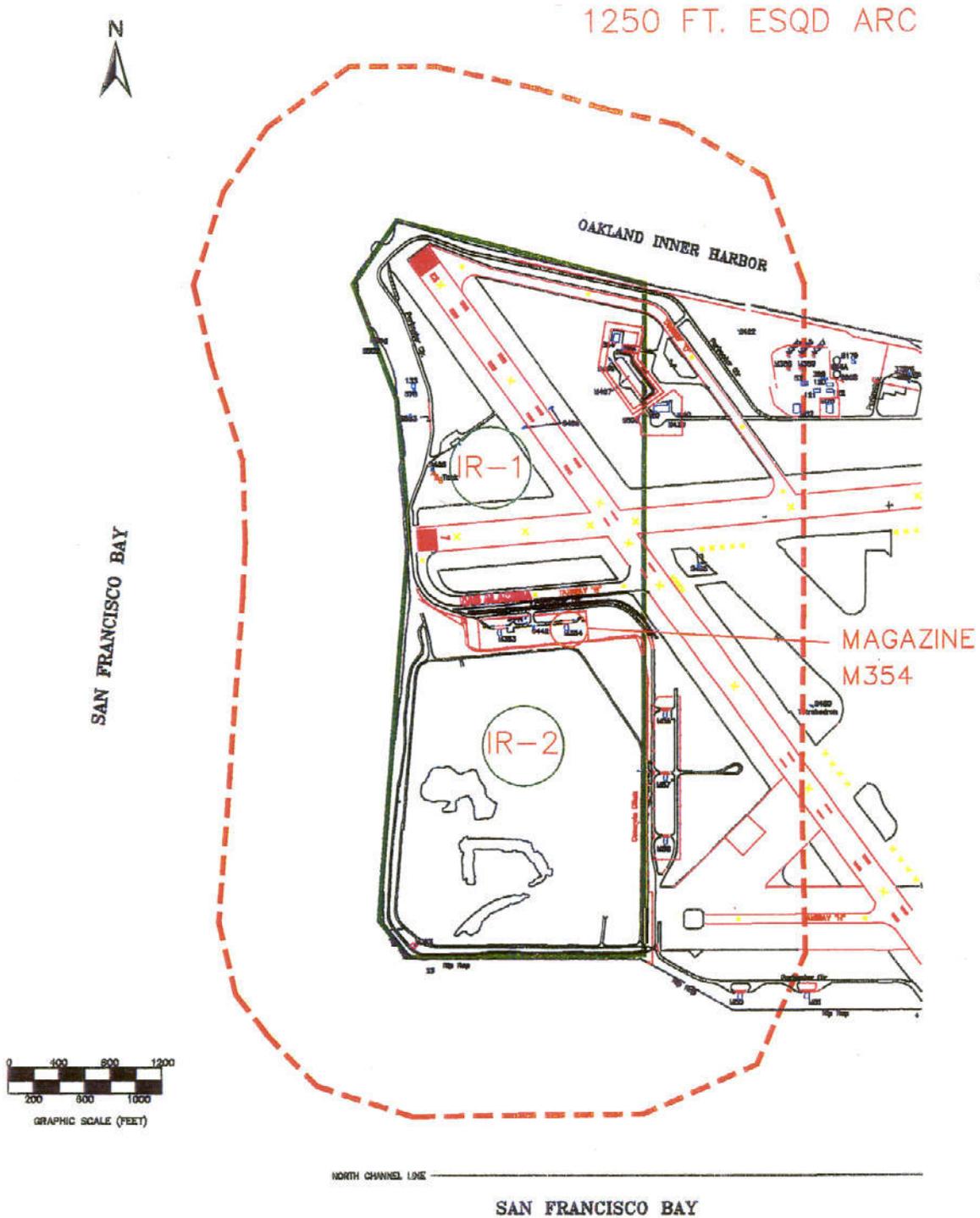
The following sections describe the exclusion zone, contamination reduction zone (CRZ), and the support zone, as well as the procedures to be followed in each. Implementation and placement of the zones is dependent on specific site conditions and will be determined by the Site Safety Officer.

- The **exclusion zone** is defined as an area where chemical contamination hazards known or suspected to be present could cause harm to personnel. The perimeter of the exclusion zone will be clearly marked to restrict access and will extend far enough to protect other personnel from the blast and fragmentation hazards of an accidental detonation. Visitors will not be permitted to enter the exclusion zone.
- The **support zone** is located in a clear area where the chance of encountering hazardous materials or conditions is minimal. The area shall be clearly marked and secured against contamination and explosive hazards. Site access and monitoring of site operations by the safety observer shall be accomplished from the support zone. The support zone shall contain provisions for on and off-site communications and serve as the staging area for safety equipment and emergency response personnel. Visitors will be permitted to enter the support zone under escort with the approval of the OHSC.
- The **Contamination Reduction Zone (CRZ)** is a transition zone between the exclusion zone and the support zone. The CRZ is designated for personnel and equipment decontamination and is used for site entry and as access for emergency response personnel.

Personnel exposure to chemical contamination at the work site is not expected since planned field activities do not involve intrusive operations. If exposure to chemical contamination is suspected, all work will stop and the RPM immediately notified.

12.2 EXPLOSIVE SAFETY QUANTITY-DISTANCE (ESQD) ARCS

The principle of Explosive Safety Quantity-Distance (ESQD), as described in Naval Sea Systems Command Ordnance Pamphlet (NAVSEA OP 5 Volume 1), was established to protect targets (personnel, buildings, etc.) from the blast, overpressure, and fragmentation caused by the unintentional detonation of explosive material. A mathematical relationship involving the net quantity of explosive material (W), the distance to a target (D) and a "safety factor" (K) is described by the equation $D=KW^{1/3}$.



NOTE: The 1250 ESQD arc shown is for visual purposes only and is based on the estimated boundaries of Sites IR-1 and IR-2. The actual ESQD arc, if required, will be determined by the location of the area selected to conduct the on-site treatment of recovered ordnance by open detonation.

FIGURE 3. EXPLOSIVE SAFETY QUANTITY DISTANCE (ESQD) ARC

The Department of Defense Explosive Safety Board has directed that all unexploded ordnance be treated as Hazard Class 1 Division 1 material regardless of the original classification of the particular ordnance items. The required minimum safety distance for Class 1 Division 1 material specified by NAVSEA OP 5 is 1250 feet. This criteria also satisfies safety requirements for the types of ordnance that may be present at the site.

Treatment of recovered ordnance will be accomplished at an area on the site by SSPORTS UXO Specialists in accordance with NAVSEA OP 5 Volume 1 and established disposal procedures. An ESQD arc will be established during demolition operations in accordance with Table 13-1 of OP 5 Volume 1 (Classifications of Detonation Sites) depending on the combined Net Explosive Weight of recovered ordnance and demolition material used for each shot.

The 1250 foot ESQD arc (Figure 3) will be maintained around the site during all emergency removal and treatment operations, including any loaded magazine. Roads will be barricaded and posted and site access restricted to personnel qualified and certified by the Explosive Safety Manager. Visitors to the site will be processed at an administrative area located outside the ESQD arc.

12.3 SECURITY

Sites IR-1 and IR-2 are located within Installation Restoration Operable Unit 3 and access to the area is secured by a locked gate. The access gate will be secured unless operations are being conducted on the site.

Access into the work site will be strictly controlled and limited to authorized personnel. Additional site entry procedures will be implemented to further restrict access into the ESQD arc surrounding the site when disposal operations are being conducted. A "Bravo" (red) flag flown near the access gate will provide a visual indicator to emergency responders that personnel are on site and explosive operations are in progress.

12.4 SITE MAP

The location of the site access gate and the ESQD arc around each site is shown in Figure 4.

12.5 ENTRY PROCEDURES

An administration area will be established outside the ESQD arc and approach to the site will be through the access gate. All persons requesting entrance to the site must be processed through the administration area. Entry into the ESQD arc and onto the site will be restricted to those persons qualified and certified by the SSPORTS Explosive Safety Manager.

12.6 HAZARDS OF ELECTROMAGNETIC RADIATION TO ORDNANCE (HERO)

Radio and radar transmitting equipment produces electromagnetic radiation which can cause an electrical current to be induced into ordnance items containing sensitive electroexplosive devices. This induced current can result in premature actuation (propellant ignition or warhead detonation) of the ordnance item. Unexploded ordnance items are considered HERO UNSAFE since their condition is unknown. HERO UNSAFE explosive devices, including electric blasting caps, may also be used during site disposal operations.

The use of devices which emit electromagnetic radiation (including cellular phones, radio transceivers, metal detectors, etc.) will therefore be strictly controlled by the Project Manager in accordance with EFA West CSO Mare Island Instruction 8023.4, HAZARDS OF ELECTROMAGNETIC RADIATION TO ORDNANCE (HERO) Emissions Control (EMCON) Procedures.

12.7 COMMUNICATIONS

Both internal and external communications systems will be established during site work. Internal communications used between field team members and the site administrative area may consist of verbal communications only or may be supplemented by flags, radio devices, hand signals, or other methods as required. The internal communications system must be understood by all team members and tested to determine its effectiveness. The following standard hand signals will be used in the event of radio failure:

- Hand gripping throat Out of air or can't breath
- Grip partner's wrist or hands around waist Leave area immediately
- Hands on top of head Need assistance
- Thumbs up OK, understand
- Thumbs down No, negative

Cellular phones will be available at the site to request off-site emergency assistance and to conduct essential administrative business. Team members will be informed of the location and operation of site communications equipment. Radio communications equipment at the site will be used in accordance with applicable HERO restrictions.

12.8 MEDICAL SUPPORT AND FOLLOW-UP REQUIREMENTS

SSPORTS employees are be required to seek medical attention and physical testing in the event of injury or possible exposure to chemical contaminants above established exposure limits. Follow-up testing may be required within 24 to 48 hours of the incident, depending on the type of injury or exposure. The type of testing performed to monitor exposure effects will be based on the circumstances involved and will be determined by a certified occupational medicine physician.

13. PERSONAL PROTECTIVE EQUIPMENT (PPE)

Appropriate PPE will be worn to protect workers from known site environmental conditions and expected ordnance hazards. The following sections describe levels of protection, protective equipment and clothing selected for use during site work, and the limitations of protective clothing.

13.1 LEVELS OF PPE

PPE shall be used whenever administrative and engineering controls are not feasible or effective in reducing exposures to hazardous conditions below acceptable limits.

Personnel will wear protective equipment when site activities involve known or suspected environmental contamination or possible exposure to fragments resulting from the unintentional detonation of ordnance. Fragmentation protection (body armor) will provide some degree of protection from injury caused by high velocity fragments. Body armor will be worn whenever there is determined to be a realistic risk of injury caused by the inadvertent detonation of ordnance.

Levels of protection and the necessary components for each are classified under four categories according to the degrees of protection afforded:

- Level D: This level of PPE should be worn in areas without respiratory or skin hazards and provides minimal protection against chemical hazards. Level D PPE also includes the use of body armor during operations where there may be an unintentional detonation of explosive ordnance.
- Level C: This level of PPE should be worn when the criteria for using air-purifying respirators are met, and a lesser level of skin protection is needed.
- Level B: This level of PPE should be worn when the highest level of respiratory protection is needed, but a lesser level of skin protection is required. Level B is the primary level of choice for unknown environments.
- Level A: This level of PPE should be worn when the highest level of respiratory and skin protection is required.

Since no intrusive operations will be conducted and exposure to chemical hazards is not expected at the site, work will be performed in Level D protection. Should site conditions indicate a higher level of protection might be required, workers will immediately withdraw from the site, notify the Site Safety Officer, and await further instructions. Descriptions of equipment and clothing required for Level D protection are discussed below. The SSO in consultation with the SSPORTS Health and Safety Office will develop revised equipment and clothing requirements should site activities require the use of additional PPE.

13.2 PROTECTIVE EQUIPMENT AND CLOTHING

PPE was selected to provide protection against known site environmental conditions and expected ordnance hazards. Level D equipment will include, but is limited to, the following items as appropriate for work and site conditions:

- **Level D**
 - Cotton coveralls or work clothes
 - Water resistant clothing (wet weather)
 - Steel-toed boots with shanks
 - Latex or nitrile disposable gloves (if applicable)
 - Leather protective (outer) gloves
 - Hard hats
 - Safety glasses or goggles
 - Head, face, and torso fragment protection (where appropriate)

Survey personnel using the magnetometers during the surface search and geophysical survey will be exempt from wearing steel-toed boots due to the sensitivity of the survey instruments. Survey personnel will be required to exercise caution while performing their tasks and to wear footwear that provides the level of protection required for site conditions.

13.3 DURATION OF WORK TASKS

The duration of site activities while wearing PPE will be established by the OHSC and will be based upon ambient temperature and weather conditions, the capacity of personnel to work in the designated level of PPE (taking into account such conditions as cold stress and workload), and the limitations of the protective equipment.

14. SAFE WORK PRACTICES

Safe work practice general guidelines for site activities include the following:

- Only vehicles and equipment necessary to complete work tasks will be permitted within the ESQD arc.
- Matches, lighters, or other spark or flame producing devices will not be permitted at the site.
- During rest periods, workers will be required to wash their hands and faces before eating or drinking.
- Site personnel will observe each other for signs of toxic exposure or cold stress. Indications of adverse effects include, but are not limited to, those listed in Section 14.
- Workers should notify someone if they develop symptoms listed in Section 14 that are not visually apparent.

The following sections describe safe work practices regarding ordnance hazards, trip and fall hazards, and avoidance of excessive noise exposure, illumination, sanitation, and site housekeeping.

14.1 SITE STAFFING

One UXO Specialist will be at the site during all operations. All operations involving the handing of ordnance will be accomplished by the UXO Specialist. Qualified survey personnel will record the location of all ordnance items recovered during the surface search and the potential UXO subsurface anomalies identified by the geophysical survey. SSPORTS UXO Specialists will oversee ordnance disposal operations and perform all related operations.

14.2 STANDARD OPERATING PROCEDURES (SOP'S)

Operations that involve the recovery and treatment of explosive materials will be accomplished in accordance with Standard Operating Procedures (SOPs) maintained by the SSPORTS Explosive Safety Office.

14.3 TOXIC EXPOSURE

Site personnel should be aware of the following symptoms which may be indicative of exposure to a chemical hazard: behavioral changes; breathing difficulties; changes in complexion or skin color; coordination difficulties; changes in speech patterns; coughing; dizziness; excessive salivation and papillary response; diarrhea; blurred vision; cramps; fatigue and/or weakness; irritability; irritation of eyes, nose, respiratory tract, skin, or throat; headache; light-headedness; nausea; sneezing; sweating; tearing; or tightness in the chest. Personnel who exhibit any of these symptoms should obtain immediate medical attention. No exposure to chemical hazards is expected at the site during the accomplishment of the surface search and geophysical survey.

14.4 ILLUMINATION

Work will be performed at the site only during daylight hours when natural illumination is adequate for good visibility.

14.5 SANITATION

Potable water, drinking cups, non-potable water, toilet facilities, washing facilities, and other sanitation requirements will be provided as required by OSHA 29 CFR 1910.120(n).

14.6 SITE HOUSEKEEPING

No hazardous or non-hazardous waste or debris is expected to be generated at the site during the surface search and the geophysical survey.

14.7 DISPOSITION OF RECOVERED ORDNANCE

Treatment of the recovered ordnance by open detonation will be accomplished on-site by SSPORTS UXO Specialists in accordance with established disposal procedures.

15. DECONTAMINATION

The following procedures for personnel and equipment decontamination will be utilized where deemed appropriate by the OHSC based on existing site conditions.

15.1 PERSONNEL DECONTAMINATION

The specific decontamination procedures outlined in this section are applicable to Level D protective equipment. Additional personnel decontamination procedures will be established by the Site Safety Office as required.

Level D is the lowest level of personal protection, providing little protection against chemical hazards. Decontamination, if required, will be accomplished in the decontamination zone as follows:

- Deposit equipment on plastic drop cloths
- Wash boots and outer gloves with a detergent and water cleansing solution and rinse with clean water
- Remove safety glasses
- Wash face and hands

15.2 EQUIPMENT DECONTAMINATION

Decontamination, if required, will be accomplished on all equipment used on the site. Equipment decontamination procedures are based on guidelines appropriate for low-level contamination. When appropriate, scrubbing with a detergent cleaning solution followed by a water rinse will be used for decontamination. Wastewater from equipment decontamination activities will be stored until proper disposal methods can be determined based on sample analysis.

Disposable equipment will be double bagged and drummed. The items will be tested for possible residual contamination and will be properly disposed of based on analytical results. Wash and rinse water will be collected and disposal based on sample analytical results.

16. GENERAL FIRST AID PROCEDURES

Dermal Exposure - Wash with soap immediately and rinse with copious amounts of clean water. Watch for signs of skin irritation. Seek medical attention at first signs of irritation.

Inhalation - Move the victim to fresh air. Give artificial respiration, if necessary and appropriate. Observe the victim for signs of shock. Seek medical attention immediately.

Ingestion - Call POISON CONTROL CENTER ((800) 478-3193) and seek immediate medical attention. If possible, a sample of the ingested material should be collected and transported to the hospital with the victim.

17. EMERGENCY RESPONSE PROCEDURES

An emergency response plan is required for all hazardous work sites. Workers are expected to evacuate in the event of a fire, explosion, toxic spill, or other major emergency. Emergency response services will be provided by the Alameda Point Police and Fire Departments and by SSPORTS site workers. This section contains information concerning emergency response procedures, identification of evacuation routes, emergency resources, and a listing of emergency phone numbers.

The following are general guidelines to be followed in an emergency:

- Take action, using established emergency procedures, to limit or prevent additional injuries or damage (if the action will not endanger life or health).
- Request assistance from appropriate emergency response services.
- Arrange for assistance to injured persons and transportation to a medical facility (after decontamination if required).
- Evaluate the need for evacuation of the site personnel or surrounding populace if the accident involves a chemical release.
- Contact a consulting physician for assistance if the type and severity of the injury warrants.
- Identify witnesses and collect statements.
- Secure the area to prevent actions that could hamper or prevent a complete investigation of the accident.
- Notify the SSPORTS UXO Project Manager and the SSPORTS Environmental Detachment Director. All injuries that require medical treatment must be reported within 1 working day. The accident/incident report form, EFA Contractor Significant Incident Report, CSIR-1, should be used to prepare this report.
- Ensure the completion of a detailed accident/incident report in coordination with the Project Manager and forward it to the Health and Safety Office Head within 2 working days.

17.1 EMERGENCY EQUIPMENT

The following first aid and general safety equipment shall be properly inspected, maintained, and available for use at the work site:

- Supply of clean water (3 gallons minimum for shower and eyewash)
- Fire extinguisher (minimum of two with ratings of 10B;C)
- Portable eyewash unit (15 minute duration)

17.2 EMERGENCY RESPONSE GUIDELINES

Standard emergency procedures to be used by site workers are described in the following sections. The OHSC shall be notified of any site emergencies and is responsible for

ensuring that appropriate procedures are followed. A copy of this HASP will be supplied to the CSO Alameda Point Fire Department before site work begins.

Following all site emergencies that require the evacuation of personnel from the work area, personnel shall not reenter the area until:

1. The condition(s) causing the emergency have been corrected.
2. Site hazards have been reassessed.
3. Site Health and Safety Plan has been reviewed (and modified if necessary).
4. Site workers have been briefed on any changes to the Site Health and Safety Plan.

Emergency escape routes will be designated for use (prior to beginning work) when egress from the work area cannot occur through the normal route.

17.2.1 INJURY

Should an injury occur at the work site, emergency medical assistance will be requested using available communications (radio, cellular phone). The emergency services dispatcher should be provided with information concerning the nature and extent of injuries. The SSO or designated personnel will act as liaison with responding emergency personnel to direct the safe evacuation of site personnel and prevent additional casualties. Emergency response personnel who must enter the site to remove the injured person shall be escorted by a UXO Specialist at all times. Appropriate first aid procedures shall be performed and the injured person transported to the designated medical facility.

Since the Site Safety Officer (SSO) must perform specific tasks relating to the safe conduct of site operations, work may not continue until the injured person is removed and replaced. Remaining uninjured site workers will evacuate and secure the site. The direct and root causes for the injury shall also be determined and corrected before site operations are resumed.

17.2.2 FIRE OR EXPLOSION

Should a fire or explosion occur on the work site, the SSO will request emergency support using the radio transceiver. The SSO will act as liaison with responding emergency personnel to direct the safe evacuation of site personnel and prevent additional casualties. Uninjured workers on the site will provide first aid to the injured worker and transport them out of the site, if possible. If the injured cannot be moved and emergency response personnel must enter the site, the UXO Specialist will escort them via a safe route into and out of the site. When there is a potential for the unintentional detonation of ordnance, the CSO Alameda Police Department will evacuate the public within a Public Withdrawal Distance of 4,000 feet.

17.2.3 EQUIPMENT FAILURE

Equipment failures that involve the ability of site personnel to safely perform their assigned tasks will be evaluated by the Project Manager and Site Safety Officer. If the

failure cannot be corrected and effects the safety of site personnel, the site shall be evacuated until the failure is corrected.

18. ACCIDENT/INCIDENT REPORTING

All injuries, accidents or near-misses shall be verbally reported to the SSPORTS OSHE office immediately (same shift). A written accident/incident report must be prepared whenever an employee, contractor, or member of the public or military is injured or becomes ill due to exposure to chemical or physical agents (possibly exceeding federal or state regulations or the threshold limit values published by the American Conference of Governmental Industrial Hygienists) related to work at a hazardous waste site. The report will be prepared by the On-Site Health and Safety Coordinator in coordination with the Project Manager. Reports will be documented in accordance with OPNAVINST 5100.23D and report form EFA Contractor Significant Incident Report (CSIR-1) and will be prepared within 48 hours after the incident occurs. Reports are also required for "near misses" and minor injuries not requiring medical attention.

The purpose of the reports is to determine and document the causes of incidents/accidents in order to prevent reoccurrence. The incident report is distributed to the SSPORTS Explosives Safety Manager, the Detachment Director, and the Site Safety Officer. Completed incident reports are maintained by the SSPORTS Code 100.1 Health and Safety Office.

The accident/incident report must be prepared in addition to any reports required by the Defense Department, Navy, OSHA, or Worker's Compensation Insurance claims offices. The information contained in the incident report should be detailed enough to allow preparation of any additional required reports. The Project Manager will review the reports and institute any corrective measures required to prevent reoccurrence. The measures may include equipment or procedural changes, personnel retraining, or issuance of cautionary warnings to personnel.

Additional reporting requirements for incidents involving explosive ordnance are contained in Chief of Naval Operations Instruction (OPNAVINST) 5102.1, "Mishap Investigation and Reporting". Explosive Ordnance Mishap Reports will be prepared and maintained by the SSPORTS Explosive Safety Office.

19. RECORDKEEPING

Health and safety recordkeeping requirements are a key component of the Navy Health and Safety program.

The basic recordkeeping requirements for employees and site activities are listed below.

- Medical Evaluation Statements
- Training Certificates
- CPR and Red Cross Certificates
- Health and Safety Plan Acceptance Forms

- Health and Safety Plan Feedback Forms
- Safety Meeting Signoff Sheet
- Site Log
- Accident/Incident Report Forms

The following items will be retained for 30 years after completion of the project:

- Copies of the Health and Safety Plan and revisions
- Records of site visits by employees, contractors, and visitors
- Accident/Incident Reports
- Audit reports
- Copies of logbooks containing issues related to health and safety

20. AUDITS

Audits are a method of evaluating the effectiveness of the Navy's Health and Safety Program. Audits may be scheduled by the SSPTS Environmental Detachment Director to occur at several times during the site investigation. The designated health and safety auditors will be personnel not involved in work at the site.

The purpose of the audit is to observe and evaluate the activities of field personnel for compliance with the Navy Health and Safety Program and this site specific Health and Safety Plan.

The auditor will inspect operations related to site control, personal protective equipment, and various other health, safety and environmental requirements. Major deficiencies that threaten health and safety will be corrected immediately. Minor deficiencies and non-critical major deficiencies will be discussed fully and all potential solutions explored before corrective action is taken.

The auditor shall not impede the performance of work at the site and should only communicate with the Project Manager, Site Safety Officer, or OHSC. The auditor has the authority in cases of imminent danger to stop work until the hazardous condition is corrected. The auditor will distribute a written report to the SSPTS Project Manager, Detachment Director, and OHSC within one week after completion of the audit.

N00236.001704
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SSIC NO. 5090.3

**APPENDIX A
HEALTH AND SAFETY PLAN ACCEPTANCE FORM**

**FINAL
UNEXPLODED ORDNANCE SITE INVESTIGATION
SURVEY WORK PACKAGE
OPERABLE UNIT 3**

DATED 02 MAY 1999

HEALTH AND SAFETY PLAN ACCEPTANCE FORM

INSTRUCTIONS: This form is to be completed by each person prior to beginning work at the UXO investigation/removal site. THIS FORM IS TO BE RETURNED TO THE SSPORTS EXPLOSIVE SAFETY OFFICE CODE 120UXO, SSPORTS ENV. DET., VALLEJO, CALIF.

Job No.: _____

Project: _____

Location: _____

By my signature below, I acknowledge that I have read and understand the contents of the Health & Safety Plan for this project. I agree to perform my work in accordance with the plan.

Signature

Print Name

Company

Address

() -

Telephone Number

Date

cc: SSPORTS Environmental Detachment UXO Project Manager
SSPORTS Environmental Detachment Health and Safety Files

N00236.001704
ALAMEDA POINT
SSIC NO. 5090.3

APPENDIX B
HEALTH AND SAFETY PLAN FEEDBACK FORM

FINAL
UNEXPLODED ORDNANCE SITE INVESTIGATION
SURVEY WORK PACKAGE
OPERABLE UNIT 3

DATED 02 MAY 1999

HEALTH AND SAFETY PLAN FEEDBACK FORM

INSTRUCTIONS: This form is to be completed by each person returning from work on the UXO investigation/removal site. THIS FORM IS TO BE RETURNED TO THE SSPTS EXPLOSIVE SAFETY OFFICE CODE 120UXO, SSPTS ENV. DET., VALLEJO, CALIF.

Problems with the Site-Specific Health and Safety Plan requirements:

Unexpected situations encountered:

Recommendations for future revisions:

cc: SSPTS Environmental Detachment UXO Project Manager
SSPTS Environmental Detachment Health and Safety Files

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SSIC NO. 5090.3

APPENDIX C
SAFETY MEETING SIGN-OFF SHEET

FINAL
UNEXPLODED ORDNANCE SITE INVESTIGATION
SURVEY WORK PACKAGE
OPERABLE UNIT 3

DATED 02 MAY 1999

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SSIC NO. 5090.3

APPENDIX D
SITE HEALTH AND SAFETY SUMMARY SHEET

FINAL
UNEXPLODED ORDNANCE SITE INVESTIGATION
SURVEY WORK PACKAGE
OPERABLE UNIT 3

DATED 02 MAY 1999

SITE HEALTH AND SAFETY
SUMMARY SHEET

TASK: _____

WORK PARTY: _____

SITE HAZARDS (C=Chemical; B=Biological; P=Physical; R=Radiological; O=Other)

	(Hazard Class)		(Hazard Class)
_____	C B P R O	_____	C B P R O
_____	C B P R O	_____	C B P R O
_____	C B P R O	_____	C B P R O
_____	C B P R O	_____	C B P R O
_____	C B P R O	_____	C B P R O

PPE REQUIREMENTS

<u>Location</u>	<u>Job Function</u>	<u>Level of Protection</u>
Exclusion Zone	_____	A B C D other
	_____	A B C D other
	_____	A B C D other
Contamination Reduction Zone	_____	A B C D other
	_____	A B C D other

Additional Requirements: _____

COMMUNICATIONS

Internal: _____
 (Method) _____ (Location) _____

Specific Instruction: _____

External: _____
 (Method) _____ (Location) _____

Specific Instruction: _____

Phone Numbers

Alameda Point Police Dispatch: (510) 748-4508 Hospital: (510) 522-3700
 SSPORTS UXO Program Manager: (707) 562-3308

ADDITIONAL INFORMATION: *Note: Approximately 10 minute response time

ON-SITE HEALTH & SAFETY COORDINATOR: _____