Naval Facilities Engineering Command, Southwest
Contracts Department
1220 Pacific Highway, Building 127, Room 112
San Diego, California 92132-5190

FINAL

SITE INSPECTION WORK PLAN

April 6, 2007

NAVAL WEAPONS STATION SEAL BEACH
DETACHMENT FALLBROOK
MUNITIONS RESPONSE PROGRAM
SITE UXO5
SALVAGE YARD LANDFILL
FALLBROOK, CALIFORNIA

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CONTRACT NO. N62473-06-D-2201
CTO NO. 0014

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DCN: ECSD-RACIV-07-0880

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ABBREVIATIONS AND ACRONYMS

AHA	activity hazard analysis
bgs	below ground surface
CAGN	California gnatcatcher
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CQC	contractor quality control
CSM	conceptual site model
CTO	contract task order
Detachment Fallbrook	Naval Weapons Station Seal Beach Detachment Fallbrook
DFW	definable feature of work
DGPS	differential global positioning system
DoD	Department of Defense
DON	Department of the Navy
DQO	data quality objective
EMI	electromagnetic induction
EMR	electromagnetic radiation
EOD	explosive ordnance disposal
EPA	U.S. Environmental Protection Agency
ESO	Explosive Safety Officer
ESQD	explosive safety quantity distance
ESS	Explosives Safety Submission
ESSL	ecological soil screening level
EZ	exclusion zone
FCR	field change request
GIS	geographic information system
HARM	high-speed anti-radiation missile
HE	high explosive
HERO	hazards of electromagnetic radiation to ordnance
HMX	octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
IRP	Installation Restoration Program
MC	munitions constituents
MD	munitions debris
MEC	munitions and explosives of concern

ABBREVIATIONS AND ACRONYMS
(Continued)

MK	mark
mm	millimeter
MP	Malcolm Pirnie, Inc.
MPPEH	material potentially presenting an explosive hazard
MRP	munitions response program
MSL	mean sea level
NAD	Naval Ammunition Depot
NAVFAC SW	Naval Facilities Engineering Command, Southwest
NAVWPNSTA	Naval Weapons Station
NCR	nonconformance report
NOSSA	Naval Ordnance Safety and Security Activity
OE	ordnance and explosives
PA	preliminary assessment
PESM	Program Environmental and Safety Manager
PjM	Project Manager
POC	point of contact
PPE	personal protective equipment
PQCM	Project Quality Control Manager
QC	quality control
QCM	Quality Control Program Manager
QP	quality procedure
RAC	Remedial Action Contract
RDX	hexahydro-1,3,5-trinitro-1,3,5-trazine
RPM	Remedial Project Manager
SAP	Sampling and Analysis Plan
SHSP	Site-Specific Health and Safety Plan
SHSS	Site Health and Safety Specialist
SI	site inspection
SKR	Stephens' kangaroo rat
SUXOS	Senior UXO Supervisor
TNT	2,4,6-trinitrotoluene
TtEC	Tetra Tech EC, Inc.
USACE	United States Army Corps of Engineers
USC	United States Code

ABBREVIATIONS AND ACRONYMS
(Continued)

USFWS	U.S. Fish and Wildlife Service
UXO	unexploded ordnance
VERTREP	vertical replenishment

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1.0 INTRODUCTION

The Naval Facilities Engineering Command, Southwest (NAVFAC SW) has contracted with Tetra Tech EC, Inc. (TtEC) to perform a site inspection (SI) for material potentially presenting an explosive hazard (MPPEH) at Munitions Response Program (MRP) Site UXO 5, the Salvage Yard Landfill (SYL), located at Naval Weapons Station (NAVWPNSTA) Seal Beach Detachment Fallbrook (Detachment Fallbrook), in Fallbrook, California (Figures 1-1 and 1-2). This project will be conducted under Remedial Action Contract (RAC) IV No. N62473-06D-2201, Contract Task Order (CTO) No. 0014.

1.1 PURPOSE, SCOPE AND OBJECTIVES

The objective of this action is to complete a MPPEH SI at MRP Site UXO5. Findings of the SI will be incorporated into an SI Report for MRP Site UXO5, which will determine if additional characterization, remedial response, or other further action is warranted. The tasks involved in the completion of this CTO for MRP Site UXO5 are summarized below. Throughout this document we will use very specific terminology to describe the various types/categories of munitions-related materials and contaminants (MPPEH, munitions and explosives of concern [MEC], munitions constituents [MC], etc.). Please refer to Table 1-1 for a comprehensive definition of these terminologies.

1.1.1 Task 1: Prepare Site Inspection Documentation

Documents necessary to perform SI work will include preparation of the SI Work Plan (including Contractor Quality Control [CQC] procedures), a Sampling and Analysis Plan (SAP), a preliminary Conceptual Site Model (CSM), and a Site-Specific Health and Safety Plan (SHSP). The fieldwork will be performed in accordance with the requirements of these documents.

This Work Plan and SHSP (under separate cover) complete the requirements of the first task. This Work Plan was prepared based on the recommendation and other information presented in the *Final Preliminary Assessment for the Munitions Response Program, NWS Seal Beach, Detachment Fallbrook* (Preliminary Assessment [PA]) (Malcolm Pirnie, Inc. [MP], 2006).

Upon approval of this Work Plan by the Department of the Navy (DON) and appropriate regulatory agencies, TtEC will proceed with the second activity, which is the MPPEH SI Field Work. Preparation of the SI Report will be performed at the completion of the site inspection. The Report will document the findings of the SI and provide further recommendations for the site. The SI report will include a screening level ecological and human health risk assessment as well as a revised Site Conceptual Model.

1.1.2 Task 2: Perform Field Work

Field work includes a 100 percent visual surface sweep for MPPEH, surface soil sampling (from zero to 9 inches below ground surface [bgs]) for explosive munitions constituents (MC) (including perchlorate) and California Code of Regulations (CCR) Title 22 metals, potential vegetation clearance (based on site conditions) around the site perimeter, a geophysical survey to determine the physical limits of the landfill, and the installation of semi-permanent fencing surrounding the perimeter extent of MPPEH contamination (as determined by the geophysical survey).

The 100 percent visual inspection of the site will allow for flagging of Munitions and Explosives of Concern (MEC) items on the surface. MEC identification/characterization will be based on visual inspection only. However the UXO technicians will utilize a ferrous metal detector during this surface sweep to assist with the visual investigation. The geophysical survey will allow better definition of the perimeter and extent of the presence of MEC in the subsurface. The specific sampling objectives for this project are to collect and analyze soil samples from the site to refine the boundaries or area(s) containing MPPEH and then reclassify these areas into one of three levels of MEC presence (known, suspected, and not suspected to contain MEC). Information gathered during this preliminary inspection may not be sufficient to fully classify the site into one of these three levels. However, this remains the overall objective and any shortcomings will be reported in the SI Report while including recommendations for further needs to meet these objectives. The analytical results will be reported to the DON to determine if additional characterization, remedial response, or other further action is warranted. Sampling and analytical data quality objectives (DQOs) are outlined in the SAP, which is included as Appendix A to this plan. Analytical results will be compared to the Environmental Protection Agency's industrial and residential preliminary remediation goals (PRGs) (Environmental Protection Agency [EPA], 2004) and ecological soil screening levels (ESSLs) where values for the analyzed constituents exist. The proposed ecological soil screening values are compiled from multiple sources. The primary values are the EPA ESSLs for metals. Secondary values include sources from the Oak Ridge National Laboratories Ecological Risk Division. These screening values and source references are included in the SAP.

1.1.3 Task 3: Establish and Manage Project Geographic Information System

An initial project geographic information system (GIS) and database will be established, incorporating data from previous and current site activities.

1.1.4 Task 4: Prepare Report of Findings

The results of the MPPEH SI will be presented in the MRP Site UXO5 SI Report. The SI report will include a screening level ecological and human health risk assessment as well as a revised Site Conceptual Model that will be used as the basis for recommendations for future actions.

2.0 SITE CONDITIONS AND BACKGROUND

MRP Site UXO5 is located in NAVWPNSTA Seal Beach Detachment Fallbrook, adjacent to the town of Fallbrook, California (see Figure 2-1). Detachment Fallbrook operates as an active munitions storage installation. Description and background of the facility and site, as well as previous investigations and the MPPEH risk, are described in this section.

2.1 SITE DESCRIPTION

2.1.1 Facility Description and Background

Detachment Fallbrook is located 53 miles north of San Diego in northern San Diego County, California, approximately 9 miles inland from the Pacific Coast. Detachment Fallbrook is bordered on the west by Marine Corps Base Camp Pendleton and is south of the Santa Margarita River. The installation currently occupies 8,852 acres, but only 274 acres are developed. The remaining acreage is mostly open space due to the Explosive Safety Quantity Distance (ESQD) arcs encompassing the magazines.

Detachment Fallbrook lies between the Santa Margarita and San Onofre mountain ranges. The topography is mostly moderate south and west facing slopes, with rough broken ridges. It varies from gently rolling hills in the southern area to steeply rising hills to the north. Elevations range from 200 to 840 feet above mean sea level (MSL).

In February 1942, then Naval Ammunition Depot (NAD) Fallbrook was commissioned. The depot's mission was to receive, store, and guard large quantities of explosives and ammunition, and to distribute and deliver them as needed to other installations. The original facilities included 133 magazines, barracks, and administration and service buildings, 16 miles of railroad, and 115 miles of roads and trails (MP, 2006). After World War II, in 1947, NAD Fallbrook was put on caretaker status. This status ended with the onset of the Korean War in 1950. In 1953, the Marine Barracks at the depot became a separate command, which replaced the Marine Guard detachment from MCB Camp Pendleton that had provided station security since the original commissioning in 1942.

In 1958, NAD Fallbrook was designated an annex of the Naval Ammunition and Net Depot, Seal Beach. In the 1960s, Detachment Fallbrook's primary duty was to support the Pacific Marine Forces. It also stored, tested, and maintained several types of missiles (MP, 2006). On October 1, 1997, following the reorganization of ordnance handling installations, the installation's name changed to Detachment Fallbrook and reported to the present NAVWPNSTA Seal Beach. Currently, the installation has 190 magazines storing pyrotechnics, high explosives, fuzes, and detonators, and small arms, among other weapons (MP, 2006). There are no active ranges within the installation.

The only West Coast air-launched missile production facility is located at Detachment Fallbrook, where air-launched missiles such as the Phoenix, Sidewinder, Maverick, and high-speed anti-radiation missile (HARM) are inspected, maintained, and recertified. The last remnants of the nation's napalm stockpile were stored at Detachment Fallbrook, and a state-of-the-art facility was built there to help eliminate these weapons. The last full napalm canister was destroyed in March 2001. Overall, the installation stores munitions with a monetary value of more than $2 billion.

Detachment Fallbrook is unique among naval weapons storage areas because it is located inland. Ammunition is transferred to and from ships by a process known as vertical replenishment, or VERTREP. In this operation, ammunition is taken by trucks from a magazine on Detachment Fallbrook to a helicopter pad located on the coast inside MCB Camp Pendleton. From there, a helicopter picks up the load and transfers it to the receiving ship waiting several miles off shore. In this manner, large vessels such as aircraft carriers and amphibious assault ships can be loaded without leaving their primary Southern California operating and training areas.

The MRP identified nine former ranges/sites at Detachment Fallbrook, six of which were identified as munitions sites through historical documents and interviews. The PA (MP, 2005) evaluated these identified ranges and sites. Upon review of MRP Site UXO5, the Salvage Yard Landfill, the PA recommended that an SI be performed with respect to MPPEH identified at the site.

2.1.2 Site Location and Background

MRP Site UXO5, the Salvage Yard Landfill, covers approximately 13 acres and is located in the northeast corner of Detachment Fallbrook, approximately 900 feet from the western corner of the installation (Figure 2-1). MRP Site UXO5 is located just east of Building 307 and is bounded on the southwest and southeast sides by Sparrow Road (Building 307 access road) and Building 365.

The local topography is characterized by low hills and natural ravines. Vegetation in the area is considered to be mostly of the coastal sage scrub classification with some mixed grasslands. Species common in coastal sage scrub habitat include coastal sagebrush (*Artemisia californica*), flat-topped buckwheat (*Erigonum fasciculatum*), laurel sumac (*Malosma laurina*), sage (*Salvia* spp.), goldenbush (*Isocoma menziesii*), and native grasses (*Nassella* spp.). Species common in mixed grassland habitat include native, perennial bunch grasses such as *Nassella* spp. mixed with non-native annuals (MP, 2006). When the site was inspected in 2004, over 98 percent of the vegetative material was less than 1 meter in height and it was determined that it provided limited components of the Critical Habitat Code of Federal Regulations (CFR)-identified constituent elements (Knight, 2004). Since that time, it has been noted that the vegetation has grown and special status species (California gnatcatcher [CAGN]) have been observed using the area. The site is within designated Critical Habitat for the CAGN and constituent elements exist on the site.

The Salvage Yard Landfill was a burial area for munitions and dunnage (MP, 2006). From 1952 through 1960, the 2-acre area located northeast of Building 307 was used to dispose inert materials (Knight, 2004). On historical maps, the area is labeled as a storage yard starting in the 1950s and ending in the late 1960s. Records indicate that expended cartridges, primers, live projectiles, and inert anti-tank projectiles were buried in the area (MP, 2006). In the mid-1960s, two pounds of five partially filled cans of smokeless powder were reportedly deposited at the site (Knight, 2004). In the late 1980s, an on-site survey was performed and revealed other materials in the disposal area, including electronic parts, inert missile parts, rubber missile shipping rings, missile test stands, practice shapes electronic test equipment, empty powder cans, metal banding, and tires (Knight, 2004). In February 2002, a brush fire exposed buried munitions in the area (Knight, 2004). An Explosive Ordnance Disposal (EOD) report from that same month described an incident in which EOD technicians from MCB Camp Pendleton were called to the site to handle suspected 20-millimeter (mm) and 40-mm rounds and blasting caps found on the ground surface.

In 2004 and 2005, visual surveys were conducted at the site as part of the PA. The surveys consisted of walking the perimeter and several transects of the site. Munitions observed during the survey activities included a 25-pound bomb, a 3-pound pyrotechnic bomb, a Mark (MK) 76 practice bomb, a 2.36-inch anti-tank high explosive (HE) rocket, a 5-pound practice bomb, 20-mm rounds, other projectiles, several smokeless powder cans and lids, and other munitions scrap (MP, 2006). Currently, MRP Site UXO5 is not in use. The area is not completely fenced.

Although originally identified under the Installation Restoration Program (IRP) as IRP Site 33, no IRP investigations have occurred at the Salvage Yard Landfill. The site is now being addressed under the MRP as MRP Site UXO5.

2.2 PREVIOUS INVESTIGATIONS

The DON is conducting this SI per the recommendation of the PA. Previous investigations at MRP Site UXO5 are described here.

2.2.1 Installation Restoration Program

The Salvage Yard Landfill was originally identified under the IRP and given the designation IRP Site 33. No IRP investigations were undertaken and the site is now being addressed under the MRP. The site is now identified as MRP Site UXO5.

2.2.2 Preliminary Assessment

The MRP identified nine former ranges and sites at Detachment Fallbrook as MRP sites. The PA (MP, 2006) was conducted to summarize the history of munitions used at the former ranges and sites identified by the MRP. Two visual surveys were performed at MRP Site UXO5 in 2004 and

2005. Several munitions were observed during these surveys. The PA concluded that an SI was recommended in reference to MPPEH at the site. No sampling has been performed at the site.

2.3 SUMMARY OF MPPEH RISK

Historical records indicate that expended cartridges, primers, live projectiles, and inert anti-tank projectiles were buried in the area. An EOD report from February 2002 states that EOD technicians from MCB Camp Pendleton were called to the site to handle some suspected 20-mm and 40-mm rounds that were found on the ground surface, as well as some blasting caps. Munitions observed during visual surveys conducted in 2004 and 2005 included a 25-pound bomb, 3-pound pyrotechnic bomb, an MK 76 practice bomb, a 2.36-inch anti-tank HE rocket, a 5-pound practice bomb, 20-mm rounds, other projectiles, several smokeless powder cans and lids, and other munitions scrap (MP, 2006).

Munitions at MRP Site UXO5 are expected below ground surface (bgs). The depth of MPPEH depends on the construction of the landfill. According to the PA, the site has known and suspected MPPEH areas. The site is suspected to have a medium MPPEH density; however, some areas of the landfill may have a higher or lower density depending on disposal practices (MP, 2006).

Following guidance documents issued by the EPA for hazardous waste sites, a CSM describing potential exposure mechanisms was developed and is presented in the PA (MP, 2006). A refined CSM, specific to MEC/MPPEH following the United States Army Corps of Engineers (USACE) guidance for ordnance and explosives (OE) sites is presented in Appendix B. This CSM will be further developed and refined based on the SI findings and presented in the SI Report.

3.0 PROJECT MANAGEMENT

The project management team will be responsible for all technical and administrative aspects of the site inspection. Included among the team's responsibilities are the project schedule, staffing, data management, document control, project meetings, and reporting.

3.1 PROJECT ORGANIZATION AND PERSONNEL

The project organization consists of DON and TtEC personnel who will conduct technical and administrative functions to ensure effective execution of the different tasks. A description of these key personnel and their responsibilities are provided below. Table 3-1 is a list of contact names and telephone numbers for DON, TtEC, and other key personnel involved in this project. A project organization chart is presented in Figure 3-1.

The DON Remedial Project Manager (RPM) for this project is Mr. Si Le who is responsible for managing the project, monitoring the budget, and maintaining the schedule. Ms. Pei-Fen Tamashiro is the Installation Point of Contact (POC) and will be responsible for coordinating field activities and ensuring that operations conducted on the site are in compliance with Detachment Fallbrook specific rules and regulations, as well as interacting with the regulatory agencies and community members. Mr. Jim Oliver is the Explosive Safety Officer (ESO) and is responsible for all issues regarding MPPEH at the site.

The key TtEC personnel involved in the performance of this CTO include the Project Manager (PjM), Site Superintendent, Senior UXO Supervisor (SUXOS), Quality Control (QC) Program Manager (QCM), Program Chemist, Program Environmental and Safety Manager (PESM), who is a Certified Industrial Hygienist (CIH), Site Health and Safety Specialist (SHSS), Project QC Manager (PQCM), and UXO technicians. In addition to these individuals, the project will be supported by a multi-disciplinary team of specialists who will lead or coordinate the various project subtasks, as required, under the direction of the PjM.

3.1.1 Project Manager

The PjM will be the main point of contact with the DON for all project-related matters, and he will be responsible for the overall conduct and performance of the project. The TtEC PjM will interface directly with the DON RPM. The PjM is primarily responsible for the development and implementation of the SI Work Plan, which includes coordination among the task leads and support staff, acquisition of engineering or specialized technical support, and all other aspects of the day-to-day activities associated with the project. The PjM identifies staff requirements, directs and monitors project progress, ensures implementation of quality procedures and compliance with applicable codes and regulations, and is responsible for performance within the established budget and schedule.

3.1.2 Site Superintendent

The Site Superintendent is responsible for effective execution of the field activities in accordance with the proposed plan and the regulatory requirements. The Site Superintendent, with the support of TtEC's SHSS, is responsible for the health and safety of field personnel. Other responsibilities include, but are not limited to, project planning; scheduling; site documentation; regulatory compliance; personnel assignments; customer and subcontractor relations; enforcing health and safety rules and SHSP requirements; and conducting routine safety inspections and incident investigations. The Site Superintendent reports directly to the PjM.

3.1.3 Senior UXO Supervisor

The SUXOS (same individual as will fill the role for Site Superintendent) will be directly responsible for all aspects of explosive safety for the project. The SUXOS will act as the Site Superintendent. The SUXOS assists in the development of site-specific work plans, identifies personnel and equipment requirements, and directly supervises all daily activities of the field team. The SUXOS is responsible for the successful performance of the field team, the early detection and identification of potential problem areas, and instituting corrective measures. The SUXOS is also responsible for executing instructions received from the TtEC PjM, the DON's RPM, and the Installation POC, documenting site conditions, photographing UXO identification operations, preparing all project reports, and identifying any effort required to accomplish the scope of work.

3.1.4 Site Health and Safety Specialist

The SHSS is UXO-qualified, and is responsible for implementing the SHSP, on-site training requirements, and recommending changes to level of personal protective equipment (PPE) to the CIH as site conditions warrant. The SHSS has stop work authority for safety conditions. The SHSS evaluates and analyzes any potential safety problems, implements safety-related corrective actions, and maintains a daily safety log.

3.1.5 Project Quality Control Manager

The PQCM is responsible for overall management of Project QC and reports to the QCM. The PQCM will be on site at all times during work activities. The PQCM has the authority to stop work on site-related issues affecting the quality of work performed and for directing the correction of all nonconforming work. The PQCM will be on site at all times during field activities.

The PQCM will be responsible for QC activity related to all MPPEH and MPPEH-related work. The SHSS will perform the duties of the PQCM for this project. The duties of PQCM include the following:

- Providing and maintaining an effective QC system for all MPPEH-related field activities

- Monitoring MPPEH-related QC activities to ensure conformance with the Work Plan, authorized policies, procedures, contract specifications, and sound practices
- Maintaining sufficient staff to perform all MPPEH-related QC activities to ensure QC for all work phases, work shifts, and work crews
- Ensuring that the three phases of inspection (preparatory, initial, and follow-up) are implemented for all work related to UXO definable features of work (DFWs) (Table 6-1)
- Ensuring that all required tests and inspections are performed and results reported
- Taking responsibility for issuance and enforcement of any Nonconformance Report (NCR)
- Providing surveillance of MPPEH-related activities
- Attending required meetings, including the pre-construction conference, all weekly QC meetings, and other scheduled meetings, as required
- Preparing the daily CQC Reports
- Performing reviews of audits and surveillance reports
- Implementing the DON technical directives relating to quality
- Discontinuing work that is not in compliance with the contract

The PQCM, in conjunction with the SUXOS, will conduct an initial briefing for all project personnel that will include a review of all the plans, the QC goals and processes, and general safety. A part of the briefing will include a functionality check of metal detectors, cameras, and communications equipment, which are the primary instruments that will be used during the course of planned work.

The PQCM will conduct periodic quality-related briefings during the morning safety meeting. Suggested topics include, but are not limited to, results from QC activities such as surveillance, inspections, process improvements, changes to procedures, and approved Field Change Requests (FCRs).

3.1.6 UXO Technicians

The UXO technicians will perform on-site duties, including locating and identifying MEC/UXO, equipment operation, MEC/UXO safety, anomaly avoidance, and escort duties, as required. The UXO technicians report to the SUXOS and may fill the roles of the SHSS and PQCM on this project.

3.2 PROJECT SCHEDULE

The project schedule is shown in Figure 3-2.

3.3 PROJECT COMMUNICATIONS AND REPORTING

The TtEC PjM will work in close communication with the DON RPM and Installation POC to keep them informed of any technical or administrative issues that may impact the project schedule or budget, and to ensure that all of the DON's project requirements are met. Any communication that has the potential to impact the project scope of work, schedule, or budget will be confirmed via written correspondence between the PjM and the RPM.

3.3.1 Progress Reports

TtEC will provide monthly progress reports to the DON for the CTO. These reports will document activities completed during the previous month, activities in progress, and activities scheduled for the upcoming month. Work breakdown structure, cost account, and manpower spread reports will also be included in the monthly progress report. These reports will reveal any actual or potential variances in the project schedule or budget. The monthly progress report will also discuss what actions, if any, will be needed to correct such variations.

3.3.2 Contractor Quality Control Report

The PQCM is responsible for maintenance of current records of QC operation, activities, and tests performed, including the work of subcontractors and suppliers. The records will include factual evidence that required QC activities and tests were performed. The daily QC Report will be completed to document site activities covered by the project QC procedures (Section 6.0) and will include the following:

- Record inspection and/or testing performed
- Identification and location of each defined feature of work (DFW) and its current phase (preparatory, initial, follow-up) of completion
- Results of inspections/testing
- Location and description of deficiencies
- Deficiencies corrected as of the date of the report
- Rework items
- Deviations from plans, difficulties, and resolution
- Test and/or control activities performed with results and references to specifications/plan requirements, including the control phase (preparatory, initial, and follow-up) and deficiencies (along with corrective action)
- Material received, with statement as to its acceptability and storage
- Submittals reviewed with contract reference, by whom, and action taken
- Off-site surveillance activities, including actions taken

The records will indicate a description of both conforming and nonconforming features covered with a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The daily QC Report attached to the Contractor Production Report will be furnished to the DON on the first workday following the date covered by the report, except the report need not be submitted for days during which no work is performed. At a minimum, one report will be prepared and submitted for every 7 days of no work and on the last day of a no-work period. All calendar days will be accounted for throughout the life of the contract. The first report following a day of no work will summarize work for that day only. The report will be signed and dated by the PQCM. The report will include copies of test reports, if applicable. The report will be provided to the Installation POC for review on the working day following the day the work was performed, or as agreed to by the Installation POC.

3.3.3 Contractor Production Report

The Contractor Production Report will be prepared for each day the work is performed and will be attached to the daily QC Report prepared for the same day. The Contractor Production Report will be prepared, signed, and dated by the Site Superintendent and will contain the following information:

- Contractor and subcontractor and their area of responsibility
- Location and description of work performed
- Trades working on the project that day and number of personnel
- Operating equipment, with hours worked, idle, or down for repair
- Work performed that day giving location, description, weather conditions, and by whom work was done
- Any delays encountered
- Site visitors/purpose
- Job safety evaluations stating what was checked, results, and instructions or corrective actions
- A list of instructions given/received and conflicts in plans and/or specifications
- Contractor’s verification statement

3.4 PROJECT DELIVERABLES

The major project deliverables for the MRP Site UXO5 MPPEH SI are provided as follows:

- SHSP
- SI Work Plan

- Field Books, Sketches, Computation Sheets, Site Photographs, Logs, and Tabulation Sheets (if required)
- Monthly Reports
- Meeting Minutes (internal Navy/TtEC meetings only)
- SI Report

3.5 MANAGEMENT OF FIELD OPERATIONS

This section describes the management of field operations during the SI at MRP Site UXO5.

3.5.1 Site Access and Control

MRP Site UXO5 is not readily accessible to the public. A gated fence exists between public roadways and the site, and a partial fence surrounds the remaining site boundary. All workers and visitors must be properly badged and cleared through Detachment Fallbrook security. Badging and passes will be coordinated through the Installation POC.

Site access and control measures implemented by TtEC will involve the following:

- Access to areas being used for investigation/surveys will be restricted through use of caution tape to ensure the activities are not disturbed.
- Temporary barricades and warning signs will be used to prevent access to any areas that pose an immediate risk to health and safety due to MPPEH found during the investigation; TtEC UXO personnel will erect the barricades and assist the ESO with road closures, if necessary. All barricades will be removed immediately after completion of MPPEH investigative operations.
- Exclusion zones that will restrict access to areas on the site will be established during certain operations and coordinated through the ESO. The size of the exclusion zones may vary depending on requirements and will be determined by the SUXOS. Security measures will be established to keep nonessential personnel out of the affected area(s).

3.5.2 Field Office/Command Post

TtEC personnel will not maintain an office trailer. Cellular phones, radios, and field trucks will be used in support of field operations. Cellular phones and hand-held radios used on the Detachment must be screened by the ESO for compliance with security and ordnance safe transmitting distances; hazards of electromagnetic radiation to ordnance (HERO) screening.

3.5.3 Traffic Control/Parking

Traffic control will be minimal, because SI activities are not expected to impact regular traffic routes. At times, it will be necessary to work near Sparrow Road at which time the road will fall within the Exclusion Zone. This work will be scheduled to take place on weekends or after

normal business hours, and during this time the road will be barricaded and flaggers provided. Work will stop as necessary to accommodate traffic at these times.

Only existing parking areas will be used. All parking areas will be approved in advance by the Installation POC. As needed, vehicles may need to travel off existing roads to move equipment and/or personnel.

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4.0 PROJECT EXECUTION

This section describes the specific activities and procedures involved in preparation for, and field implementation of, the planned inspection activities at MRP Site UXO5. The planned remediation activities include pre-inspection preparation, subcontracting and procurement, notifications, a kick-off meeting, mobilization, a surface search of the entire site, a partial geophysical survey to identify landfill boundaries, collection of soil samples, and the installation of a semi-permanent fence around the site perimeter. Pre-construction preparation and subcontracting and procurement will not be discussed.

4.1 NOTIFICATIONS

TtEC will obtain all necessary authorizations (as requested by NAVWPNSTA Seal Beach Detachment Fallbrook) before commencing the activities that will comprise this SI. Anticipated notifications include Detachment Fallbrook security and operations, representatives from Buildings 307 and 365, the explosives safety office, the project RPM, the Installation POC, Detachment Fallbrook Environmental, and other personnel as directed.

4.2 KICK-OFF MEETING

A kick-off meeting will be held between the DON and TtEC at least 2 weeks prior to the start of the field activities at the MRP Site UXO5. The following personnel will be requested to attend:

NAVFAC SW	TtEC	Detachment Fallbrook
RPM Mr. Si Le	PjM Mr. Kent Weingardt	Installation POC Ms. Pei-Fen Tamashiro
	UXO Coordinator Mr. Lance Humphrey	Explosives Safety Officer Mr. Jim Oliver
	SUXOS/SHSS Mr. Anthony Crino	Detachment Fallbrook Security TBD
	PQCM Mr. Lance Humphrey	Detachment Fallbrook Operations TBD
		Detachment Fallbrook Environmental Christy Wolf
		Detachment Fallbrook Fire Department TBD

Notes:

TBD – To be determined – for the kick-off meeting, the Installation POC will coordinate with TtEC to identify and notify all Detachment Fallbrook personnel who will attend the meeting.

The purpose of this meeting will be to develop a mutual understanding of inspection activities, the CQC details including forms to be used, administration of on-site work, and coordination of the surface sweep and exclusion zone implementation. TtEC will prepare minutes of the meeting for submittal to the DON.

4.3 MOBILIZATION

A list of field personnel with health and safety certifications and site vehicle information (proof of current vehicle registration and insurance) will be collected during mobilization and retained in project files. Upon receipt of appropriate records and authorizations, field personnel and equipment will be mobilized to the site.

4.3.1 Safety Procedures

Safety is the primary concern during the performance of all activities for the project. Personnel engaged in these efforts will adhere to the provisions of the Site-Specific Health and Safety Plan (TtEC, 2006a). Additional safety guidance pertaining to MPPEH can be found in TtEC procedure UXO-4 (*General UXO Safety Precautions)* (TtEC, 2005) and Department of Defense (DoD) 4145.26-M, *Contractor's Safety Manual for Ammunition and Explosives* (DoD, 1985*)*. The UXO project SHSS will brief all site personnel on the Activity Hazard Analyses (AHAs) attached to the SHSP and the other aforementioned safety documentation at the initial safety/indoctrination briefing and selected safety topics during morning safety tailgate briefings.

Prior to beginning fieldwork, TtEC will coordinate with the ESO and Detachment Fallbrook security to provide a briefing to the nearby building occupants/workers as to the nature of the work being conducted and evacuation procedures. All workers will be given an explosives safety briefing prior to entering the exclusion zone (EZ). This briefing will be conducted by the TtEC SUXOS in coordination with the Fallbrook ESO.

4.3.2 Temporary Support Facilities

Mobilization will include the movement of equipment and materials to the site, health and safety awareness training (including both site inspection and MPPEH-related issues), and site orientation of field personnel. Mobilization will involve the establishment of a suitable staging area to support the project activities, which will include equipment and waste storage areas. An office trailer will not be maintained; cellular phones, two-way radios, and field trucks will be used in support of field operations. Portable restrooms and a hand-wash station may be mobilized to the site, if suitable facilities cannot be annexed in Building 307. The staging area will be located in areas approved by Detachment Fallbrook operations/security offices and coordinated with the Installation POC.

4.3.3 Surveying and Site Control

At the outset of the planned inspection-related activities, the approximate boundaries of MRP Site UXO5 will be clearly marked using surveyors' tape or pin flags on the peripheries not defined by Sparrow Road or the Building 307 parking lot. The Salvage Yard Landfill borders (both defined and undefined) will be used to establish an EZ in the area to be inspected. For the purposes of this visual survey, a 50-foot EZ will be used because MPPEH encountered will be left undisturbed while identification and location data are recorded. The exclusion zone is depicted in Figure 4-1.

The survey of the areas nearest to the buildings and Sparrow Road will be scheduled on a weekend when the buildings are normally vacant and the access road is not used. If present, personnel working inside Buildings 307 and 365 will be asked to remain inside the buildings while the survey is taking place. Similarly, when the survey is being conducted along Sparrow Road, it will be barricaded. Representatives from both of the buildings and the Detachment Fallbrook security officer will be provided with a schedule with the dates and times these events will occur.

4.3.4 Communications

Hand-held radios and cellular phones will be the primary source of communications between the TtEC UXO inspection team. Emergency telephone numbers and the telephone numbers for all personnel associated with this project will be included in the SHSP. A revised list of contact names and telephone numbers will be prepared and distributed to the Installation POC and the DON immediately following site mobilization.

Electromagnetic radiation (EMR) is produced by hand-held radios and cellular telephones and may cause a detonation hazard with electrically fuzed ordnance. EMR precautions will be taken during the inspection activities where MPPEH with electrical fuzing is encountered. No cellular telephones will be used inside the EZ without prior notification and permission from the SUXOS, except in emergency situations. Hand-held radios and cellular phones will have HERO screening performed to ensure safe transmitting distances.

4.3.5 Metal Avoidance Procedures

Approximately 29 soil samples will be collected from MRP Site UXO5 and analyzed for CCR Title 22 metals and MCs (including perchlorate). The approach for the selection of sample collection points will be based on the results and analysis of the visual surface search of the site and is discussed in subsequent sections to this Work Plan and the SAP (Appendix A). Metal avoidance procedures will be used when the soil samples are collected and during fence installation.

A UXO technician will escort the sampler during the collection of soil samples. The technician will clear each sampling location by moving a magnetometer over the ground surface of a 2-foot by 2-foot area surrounding the proposed sampling location. A soil sample will be collected from ground surface to a depth of 9 inches bgs. The sample will be homogenized in accordance with procedures included in the SAP. This depth represents the capability of the magnetometer (Schonstedt or other suitable instrument) to detect a single 20-millimeter round (the smallest MEC item of concern) from ground surface. Sample locations will be chosen based on a random selection of points in areas known to contain MPPEH. Additional samples will also be collected in areas found to contain MPPEH during the surface survey of the site. A differential global positioning system (DGPS) will be used to locate each sample point, and a UXO technician will use a hand-held magnetometer to scan the sample area. If the selected location is found to be free of metal to 9 inches bgs, the sample will be collected. If metal is detected, an alternate, metal-free collection point will be selected adjacent to the original site. The same avoidance procedure will be used for installation of fence posts to support fencing installation. Detailed notes, photographs, and DGPS location information will be collected to document any anomalies detected, which will be avoided during sampling and fence installation activities.

4.4 MPPEH SITE INSPECTION

MPPEH, when encountered, will be identified and characterized as either MEC items (UXO, discarded military munitions [DMMs], or MC) or non-MEC items (munitions debris [MD], or MC).

MPPEH contamination, including both MEC and non-MEC, is known to exist at MRP Site UXO5. Accordingly, procedures have been prepared to locate, identify, georeference and annotate encountered MPPEH, which are discussed in the following subsections.

4.4.1 MPPEH Surface Search/Survey

A 50-foot EZ will be established when the SI activities commence. The limits of the EZ will be clearly marked with traffic cones and caution tape. Barricades will be installed when the surface survey is being conducted in the areas where the EZ encompasses the road. (Note: These areas will be scheduled to be conducted on a weekend when the buildings and access road are normally not in use). Before the surface search begins, the SUXOS will ensure that all nonessential personnel are outside EZ boundaries.

A line or other suitable marking device will be used to mark the path of advance on the initial sweep of the area along one of the boundaries. UXO technicians will form a line abreast, perpendicular to the path of advance spaced about 5 feet apart. The UXO technician positioned on the path (perimeter) marker will act as the guide and proceed in a straight line along the initial search boundary. The remaining UXO technicians will maintain spacing and distance off the UXO guide and advance across the search area, using Schonstedt (or other suitable instruments)

metal detectors to provide an audible backup to the visual search being conducted. The magnetometer is not being relied upon (at this point) to give suitable information regarding materials at depth. It is only to assist the technicians in the visual search. The UXO technician on the outside of the line will mark his/her starting and ending position on the boundaries, and when the sweep line reaches the opposite side of the search area, the marking device will be moved to provide the basis for the ensuing search. This process will be repeated until the entire site has been swept. The SUXOS may amend this process as conditions warrant.

No MPPEH items will be recovered during these efforts. If encountered, MPPEH items will be identified, georeferenced (with a DGPS), documented in an MPPEH log (to be developed on site), photographed, and left as-found, undisturbed.

Because no MPPEH items will be recovered during the SI efforts, an Explosive Safety Submission (ESS) is not required. Instead, an ESS waiver will be submitted to Naval Ordnance Safety and Security Activity (NOSSA) for review. A copy of the waiver (and initial waiver request) can be found in Appendix D.

However unlikely, MEC items may be discovered that present an immediate threat to human health and the environment. These items may be in the form of fuzed and fired rockets or projectiles, fuzed ordnance in an armed condition, etc. If this situation is actualized, the SUXOS will halt the survey activities and establish an expanded EZ appropriate for the encountered MEC item(s). The installation ESO will be immediately contacted, informed of the situation, and requested to call for EOD support from MCB Camp Pendleton. All nonessential project personnel will be directed to relocate to an area outside the EZ. If evacuation of buildings within the expanded EZ becomes necessary, the ESO will work with Detachment Fallbrook security to initiate and coordinate the evacuation. The SUXOS and ESO will coordinate activities with Detachment Fallbrook security to barricade Sparrow Road, and maintain a watch on the site until EOD personnel arrive.

4.4.2 Vegetation Clearance

Vegetation clearance may be required if the vegetation is taller than 4 inches; however, vegetation clearance (mowing) will not take place during the breeding season for special status species birds. During mowing activities, UXO technicians will proceed ahead of the mower(s) with hand-held magnetometers (Schonstedt or White metals detectors) to prevent the mowers from passing over any potential MPPEH items. Vegetation clearance (mowing) will only be performed as needed around the perimeter of the site to support the fence installation. Biological avoidance and minimization measures will be implemented during this activity (as well as other site activities) as detailed in Section 5 of this Work Plan.

4.4.3 Munitions Constituents Sampling and Analysis

MPPEH, both MEC and non-MEC, were observed during the earlier visual surveys at MRP Site UXO5. The data collection and analyses performed as part of the PA led to the preliminary subdivision and characterization of MRP Site UXO5 into the following two levels of MEC presence:

- Known MEC Areas
- Suspected MEC Areas

The boundaries associated with these areas are illustrated in Figure 4-2. These designations were made based on the observation of all forms of MPPEH on the surface during the visual surveys performed during the PA. The SI will, as one primary objective, focus on establishing more accurate boundaries between the areas with MEC and areas without MEC (i.e., resolving the areas suspected of containing MEC into either known or not suspected to contain MEC to the extent possible). With more accurate boundaries, future investigation, removal, or remediation resources will be efficiently used (i.e., areas where additional response is needed.)

During the SI, MPPEH presence will be based on a systematic visual surface survey of MRP Site UXO5. As illustrated in Figure 4-2, one area in the northeastern portion of the interior of the landfill has been identified as a "*Known MEC Area*." The boundary of this area was estimated during the PA based on the results of the visual survey performed during that effort. Photographs of what appear to be intact 20-mm gun rounds in a burial pit along the retaining wall on the west side of the Salvage Yard Landfill, along Sparrow Road, were included in the PA. A large portion of the rest of the site is categorized as a "*Suspected MEC Area*" based, in part, on the results of the PA survey. The SI will collect additional information in the "*Suspected MEC Area*" through a more systematic, tightly spaced visual surface survey, a geophysical survey (for detection of subsurface anomalies) and targeted MC soil sampling. With this information, the boundaries of the area(s) containing MPPEH can be refined, either by adjusting the boundaries of the current *Known MEC Area*, or by identifying additional *Known MEC Areas*. After the boundaries have been reconstituted, MRP Site UXO5 will be reclassified into one of three levels of MEC presence (*Known, Suspected,* and *Not Suspected to Contain MEC*).

Certain chemical constituents, including hexahydro-1,3,5-trinitro-1,3,5-trazine (RDX), octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX), and 2,4,6-trinitrotoluene (TNT), associated with older buried ordnance may be present at depleted levels due to biological and chemical degradation/depletion by natural infiltration and dispersion over the years. The highest MC concentrations in soil are expected to be found in and near areas where multiple MEC items are located. An initial estimate of the presence of MC at MRP Site UXO5 will be established through a selective surface and near-surface soil sampling program (from zero to 9 inches bgs), which will supplement the findings of the MPPEH visual surface survey as well as the geophysical survey. Additionally, given the potential for erosion and redeposition of soil (as

indicated in the current CSM in the PA), areas of possible erosion and/or redeposition may also be a collection point for MC analysis. Consequently, consistent with the SI sampling objective of finding and characterizing the primary source areas or areas of release, the sampling program will be linked to the findings of the MPPEH visual surface survey.

Soil samples will be obtained at discrete locations from zero to 9 inches bgs. The soil collected from the zero to 9 inches bgs will be homogenized at the laboratory into one discrete sample from each sampling point in accordance with the procedures outline in the SAP. The depth of 9 inches was selected to correspond with the depth at which magnetometers, with high confidence, can detect the smallest MEC item (a 20mm round). Areas where soil samples will be collected and analyzed for explosive constituents (including perchlorate) and CCR Title 22 metals include: (1) locations where MPPEH items are found during the SI visual surface survey; (2) locations where eroded soil has apparently redeposited; and (3) areas of stressed or no vegetation, which may also indicate the presence of MPPEH contamination. The number of soil samples necessary to collect to apply these cannot be precisely known prior to performing the visual surface survey, but the number has been estimated based on currently available information, as shown in the Table 4-1. In addition, samples may be screened in the field using test kits for explosives at the discretion of the UXO technician (based on his visual inspection of the material sampled). The field screening will only be performed when the UXO technician (based on experience) believes that the media contains very high concentrations of explosive constituents. This will ensure that samples are not sent off site to a laboratory containing high concentrations of explosives. If test kits confirm presence of explosives, then an alternate location will be sampled. We are planning to utilize the EXPRAY Explosives Detection/Identification Field Test Kit for this purpose. EXPRAY is an aerosol-based field test kit for the detection and identification of Group A explosives (TNT), Group B explosives (RDX), and compounds containing inorganic nitrates. The test kits will be used strictly in accordance with the manufacturer's instructions. Detailed notes, photographs, and DGPS location information will be collected to document each sampling location and conditions surrounding sample acquisition (including any "step-out" required to find a location suitable for sampling).

The specific sampling objectives for this project are to collect and analyze soil samples from the site to refine the boundaries or area(s) containing MPPEH and then reclassify these areas into one of three levels of MEC presence (known, suspected, and not suspected to contain MEC). The analytical results will be reported to the DON to determine if additional characterization, remedial response, or other further action is warranted. Sampling and analytical DQOs are outlined in the SAP included as Appendix A to this plan. The attached SAP also includes all details and procedures on sample acquisition and analytical approach.

Analytical results will be compared to industrial and residential PRGs and ESSLs where values for the analyzed constituents exist. The proposed ecological soil screening values are compiled from multiple sources. The primary values are the EPA ESSLs for metals. Secondary values

include sources from the Oak Ridge National Laboratories Ecological Risk Division. These ESSLs are very conservative numbers and will only be used for screening purposes. They are based upon conservative exposure assessments that assume full-time exposure and 100 percent bioavailability. For a few components, published screening values do not exist. In these situations we will defer to the PRGs. In some instances, our laboratories cannot report to the screening levels prescribed. In these few cases, the laboratory's quantitation limit will be utilized as the screening level. Specific screening levels, source references, default screening values, and laboratory detection limits are tabulated in the attached SAP (Appendix A).

4.4.4 Geophysical Survey

A geophysical survey of the site will be performed to further delineate the boundary and identify subsurface anomalies that may represent subsurface MEC. The west and south borders of the landfill are assumed to be the Building 307 parking lot and the access road (Sparrow Road) bounding the site. The survey will be performed by following transects across the site spaced approximately 10 feet apart. The total length of transects to be surveyed will be approximately 90,000 linear feet.

A Geonics EM31 MKII ground conductivity meter coupled with a Leica GPS1200 survey grade survey instrument will be used to survey the site for the boundary delineation. The EM31 MKII is a frequency domain electromagnetic instrument that has the ability to detect metallic and non-metallic debris, and operates on frequency domain electromagnetic induction (EMI) methodology, whereby a primary magnetic field is generated beneath the ground surface by a current in the transmitter coil. This primary magnetic field induces current to flow within the ground (i.e., eddy currents), which produces a secondary magnetic field that is detected along with the primary field at the receiver coil. The ratio of the secondary field to the primary field is linearly related to terrain conductivity under certain constraints. Two components of the secondary magnetic field are digitally measured, including the quadrature phase (terrain conductivity) as millimhos per meter (mmhos/m), and the in-phase component expressed in parts per thousand of the primary signal (a measure of signal amplitude). The in-phase part component of the signal recorded by the instrument is particularly sensitive to ferrous and non-ferrous metallic material. The maximum range of the EM31 is approximately 18 feet bgs (for a drum-sized object) and 5 to 8 feet bgs is the optimal range depending on the conductivity of the soil. The instrument is most sensitive and receives the maximum response for metallic objects within the optimal depth range. The key in defining the site boundary is detecting large masses of metallic debris (indicative of a contiguous landfill). The EM31has proven quite effective in these types of situations in virtually all soil types at depths generally up to 10 feet bgs and often deeper.

EMI surveys are used to detect contrasts in ground conductivity and metallic (ferrous and nonferrous) materials. Conductivity contrasts in the earth can be caused by natural phenomena,

such as variations in lithology, moisture content, manmade phenomena (such as disturbed ground), buried metal, groundwater, and in certain cases, contaminants in the soil. The collected geophysical data are processed and concatenated with geographic location data that are collected with a DGPS at the same time the geophysical data are collected. The processed data will be used to generate a map of the site that shows the extent of the landfill boundaries and subsurface anomalies within the depth range of the instrument.

4.4.5 MPPEH Management

As mentioned previously, no MPPEH in any form (inert or explosive-filled) will be recovered. When encountered, the item(s) will be identified, photographed, geographic locations noted using a DGPS, and left as-found, undisturbed. The locations and photos of the items will be inserted into the geophysical map to provide a figure that shows the types and locations of ordnance present at MRP Site UXO5 and a clear indication of the extent of MPPEH contamination. The information will also be included in the SI Report that will be completed following the field activities for use in the subsequent remediation of the site.

4.4.6 Quality Control

A magnetometer (e.g., Schonstedt, Vallon, White, etc.) test grid will be established and seeded with a predetermined amount of 20-mm target practice rounds (or equivalent surrogate items) buried at a various depths, not to exceed 9 inches. (Other items may also be installed in the test grid.) Prior to commencing daily excavation activities, the UXO technicians will pass their magnetometers over the test grid to ensure the equipment is functional. All of the buried rounds must be detected for the equipment to be used on the project. The PQCM will record the results of the magnetometer functionality tests on a daily basis.

4.5 INTERIM RESPONSE

The site will be enclosed within a 6-foot chain-link fence due to its proximity to Navy housing. The chain-link fence proposed here is the same fence that had previously been proposed by the Navy to support the ongoing grazing program. The fence will be constructed under this project (via the MRP) since it also serves as an interim protective measure for potential risk receptors.

After the boundaries of the landfill have been identified through geophysical survey, the boundaries will be marked with surveyors' tape and pin flags. The locations of the boundaries will also be recorded using a DGPS. Prior to installation, the available utility drawings for the site will be reviewed to ensure utilities will not be encountered or impacted during installation. Additionally, the geophysical survey (Section 4.4.4) will serve as a subsurface utility search within the area in which the fence will be installed. A 20-foot buffer zone beyond (outside) the landfill boundaries will then be marked and a semi-permanent fence will be installed along the north and east sides of the landfill, and along the parking lot and access road to the west and

south. New fencing will not be installed if existing barbed-wire fence is in place (such as around the building compounds). Fence posts will be driven into the ground with standard post-driving equipment, but concrete footers will not be used. UXO technicians will clear the locations of the fence posts before they are put into the ground in accordance with previously defined procedures (Section 4.3.5). The fence will be 6 feet high and be chain link in nature. A double gate will be installed to allow access into the site from the Building 307 parking lot. Signs reading *Danger, UXO Present, Keep Out* (or similar) will be posted at regular intervals along the fence.

5.0 BIOLOGICAL CONSTRAINTS AND PROPOSED AVOIDANCE AND MINIMIZATION MEASURES

MRP Site UXO5 is being investigated in accordance with the approach outlined in this Work Plan. Considering the federally listed species and Critical Habitat designations relevant to this site, all field activities will be conducted with the concurrence of the U.S. Fish and Wildlife Service (USFWS). Concurrence will be sought through an informal consultation process with the USFWS. The informal consultation process will be initiated through NAVWPNSTA Seal Beach Detachment Fallbrook. Field activities described in this Work Plan will observe appropriate avoidance and minimize measures as described in Section 5.3.

Notifying the USFWS that non-intrusive and intrusive field activities are being planned for MRP Site UXO5 will include a description of the site's biological setting and a detailed map showing the study area boundaries, proposed geophysical survey area, proposed sampling locations, and ingress and egress routes to be used by field personnel and equipment. Notification will also include a list of equipment to be used and its potential impact, and a statement on potential "Take," as defined in regulations. If required for concurrence from the USFWS, CAGN and Stephens' kangaroo rat (SKR) surveys may be conducted following CAGN Protocol and SKR Protocol. If required, these surveys will be conducted by the NAVWPNSTA Seal Beach Detachment Fallbrook Conservation Program Manager or a designated qualified biologist. In general, CAGN protocol requires 3 days of field surveying to assess nesting locations and territory. SKR protocol includes 5 nights of trapping to assess the density of SKR in a certain area. USFWS concurrence will be obtained on protocol techniques prior to conducting the surveys and trapping.

5.1 BIOLOGICAL SETTING

A good portion of the vegetation within MRP Site UXO5 combusted in February 2002 as a result of the Gavilan fire that started near Gavilan Mountain southeast of De Luz Road (off Detachment Fallbrook). In the subsequent years, vegetation growth has advanced through patterns typical of post-burn seral plant ecology. The vegetative communities associated with MRP Site UXO5 include California sagebrush (*Artemisa californica*), California buckwheat (*Eriogonum fasciculatum*), deer weed (*Lotus scoparius*), and a few individuals of white sage (*Salvia apiana*) along the southern extremes. When the site was inspected in 2004, over 98 percent of the vegetative material was less than 1 meter in height and it was determined that it provided limited components of the Critical Habitat Code of Federal Regulations (CFR) – identified constituent elements (Knight, 2004). Since that time, it has been noted that the vegetation has grown and special status species (CAGN) have been observed utilizing the area. The site is within designated Critical Habitat for the California gnatcatcher and constituent elements exist on the site.

Species federally listed as endangered or threatened that could potentially occur at MRP Site UXO5 (based on their presence in similar areas in San Diego County and initial surveys conducted by the USFWS on Detachment Fallbrook in March and April 1990) include the California gnatcatcher (*Polioptila californica californica*), Stephens' kangaroo rat (*Dipodomys stephensi*), arroyo toad (*Bufo californicus*), least Bell's vireo (*Vireo bellii pusillus*), quino checkerspot butterfly (*Euphydryas editha quino*), and thread-leaved brodiaea (*Brodiaea filifolia*). Several unlisted, yet sensitive bird species are known to occur in this area of Detachment Fallbrook. They include the rufus-crowned sparrow (*Aimophila ruficeps*), grasshopper sparrow (*Ammodramus savannarum*), and protected raptors such as the Cooper's hawk (*Accipter cooperii*) and Golden Eagle (*Aquila chrysaetos*). Table 5-1 presents the activity periods of special-status species.

In 2004, the site was characterized as not containing sufficient constituent elements to constitute a use-area visited with any frequency (Knight, 2004) with reference to the California gnatcatcher (CAGN). Naval natural resource biologists have conducted recent surveys for the presence of CAGN in the area; up until 2006, no sitings were documented on four separate occasions. A 2006 CAGN survey of the area showed multiple pairs in a 250-ft buffer area around and, in certain instances, inside the proposed project boundary area.

During a four-day trapping session in May 2004 two SKR were captured within the project site boundary. Also during that trapping session 18 non-listed Dulzura kangaroo rats (DKR) were captured on the site. Because SKR were captured at proportionally and absolutely low numbers, and because the two SKR were observed to return to burrows outside of the site boundary, it was determined that the site was occupied by SKR, but at "trace levels."

Section 5.3 (which follows below), therefore, addresses proposed measures to avoid a "Take" of these species and to minimize effects to their respective potential habitats. A "Take," as defined by the USFWS, is considered activities that harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect a listed species. Furthermore, any attempt to engage in any such conduct may include significant habitat modification or degradation if it kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering.

During the course of field activities, compliance with the substantive requirements of the following regulatory legislation will be required:

- Migratory Bird Treaty Act of 1918
- Endangered Species Act of 1973, as amended
- Fish and Wildlife Act of 1956, as amended by the Fish and Wildlife Improvement Act of 1978
- Section 404 of the Clean Water Act

5.2 SUMMARY OF PROPOSED FIELD ACTIVITIES

The following are the proposed field activities to be conducted as part of the SI at MRP Site UXO5:

- MPPEH Surface Search/Survey. Refer to Section 4.4.1 of this Work Plan for more detail.
- Perimeter Vegetation Clearance. Refer to Section 4.4.2 of this Work Plan for more detail.
- Munitions Constituents Sampling and Analysis. Refer to Section 4.4.3 of this Work Plan for more detail.
- Geophysical Survey. Refer to Section 4.4.4 of this Work Plan for more detail.
- Perimeter Fence Installation. Refer to Section 4.5 of this Work Plan for more detail.

5.3 PROPOSED AVOIDANCE AND MINIMIZATION MEASURES

At a minimum, the following avoidance and minimization measures will be implemented during field activities. Should any additional avoidance and minimization measures and/or protocol be agreed upon through informal consultation between NAVWPNSTA Seal Beach Detachment Fallbrook and the USFWS, these new measures and/or protocol will be implemented prior to and/or during field activities. Revisions will be included with these Work Plans as an attached amendment.

5.3.1 Worker Education Briefing

Before the start of any activities, all on-site personnel will be briefed on health and safety issues and the need for minimizing impact on sensitive biological resources. Methods for avoiding and minimizing potential impacts on the species and communities of concern will be stressed during the on-site training. The TtEC-qualified biologist will oversee this training with input/coordination with the NAVWPNST Seal Beach Detachment Fallbrook Conservation Program Manager as needed.

5.3.2 Wildlife Mapping and Biologist Oversight

Within the project footprint, suitable habitat for the SKR will be mapped by a permitted 10(a)(1)(A) biologist. This biologist will be a TtEC employee or subcontracted by TtEC. Burrows will be flagged and areas showing diagnostic sign and ecology (scat, dusting, bathing, footprints) will be marked and avoided. A TtEC biologist familiar with CAGN and SKR will be present during the mowing operation. This biologist will be available by phone at all times to provide assistance with biologically related issues that may arise during the site investigation.

5.3.3 Plant Community Protection

Plant species found within the ecosystem and other portions of Site 33 are not state or federally listed. The vegetation may be mowed to a maximum height of 4 inches to facilitate the fence installation. In the event trees are encountered, they will be pruned on a case-by-case basis and only as required to accomplish the tasks as outlined in this Work Plan. Tree removal is not likely required to perform the MPPEH surface sweep, geophysical activities, or survey activities at Site 33.

5.3.4 Wildlife Protection

Wildlife species most susceptible to project activities include avian species and small mammals. These species may be adversely affected by the mowing of existing vegetation to a 4-inch height. To minimize impacts to these species, the TtEC biologist will perform a visual inspection of the area planned for mowing immediately prior to the activity. The biologist will identify any sensitive areas that need to be avoided during the mowing activity. The biologist will also be on-site during the mowing activities to ensure compliance with avoidance measures and to respond to any issues that arise during fieldwork. Mowing activities will take place outside of breeding season for special status species birds (February 15 through August 31). The TtEC biologist will coordinate with the NAVWPNSTA Seal Beach Detachment Fallbrook Conservation Program Manager as required to coordinate all oversight work during this project.

5.3.5 Other General Criteria to Ensure Avoidance and Minimization of Biological Impact

- To the maximum extent feasible, the use of heavy equipment and off-road intrusion will be avoided in areas with sensitive biological resources.
- All staging areas and access routes will be flagged. Vehicles will remain within the designated access routes and staging areas. Personnel will minimize going outside of the access routes and staging areas. Personnel access outside of routes/staging areas will be limited to that absolutely necessary to carry out the scope of this project.
- To prevent unnecessary disturbance to the soil, access routes will be selected to minimize the need for the field equipment to perform multiple point turns. Vehicles will enter and exit in the same access corridor route. In general, the only vehicle access planned for the site is to accommodate fence installation. Access routes will be cleared by UXO technicians via surface sweep (Section 4.4.1) prior to vehicle access.
- Parking of personal vehicles will not be permitted within the boundaries of the site. All vehicles will be parked in appropriate staging areas on approved surfaces.
- Only rubber-tired vehicles will be used on site during the proposed project actions. In general, access by any vehicle onto the site will be minimized to that absolutely necessary to carry out the scope of this project.
- Project work will not occur during periods of darkness.
- Vehicles will not remain through the night within the project footprint.

- Any project activities resulting in holes in the ground (e.g., from sampling) will be filled in the same day they were made.
- All activities within the project area may be ceased at any time if the on-site biologist determines that activities may threaten a “Take” of an individual or paired CAGN.

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6.0 WASTE MANAGEMENT

During the course of this project only a minimal amount of waste will be generated due to the largely non-invasive nature of the project. The following waste items will be generated:

- PPE consisting primarily of latex gloves generated during sampling activities
- Disposable sampling supplies, including disposable plastic scoops, zip-lock bags, and paper trash (extra labels, custody seals)
- Other common trash such as paper, empty containers, wrapping, packing supplies, etc.

All of these items, even those that have contacted potentially contaminated soil, will be considered non-hazardous common trash. These items can be disposed of at any proper trash receptacle at the installation. TtEC will place the waste items in doubled up plastic garbage bags and close the bags with ties or knot the tops. The trash will then be placed in a receptacle at Detachment Fallbrook that has been approved by the Installation POC in advance.

At this point we do not anticipate that decontamination rinsate will be generated due to the use of disposable sampling equipment. However, it may be necessary to utilize shovels or other small tools to obtain samples depending on soil conditions at the site. If this becomes necessary, we will properly store any generated decontamination rinsate, properly sample the liquid, and dispose of it at the appropriate facility/location. This would all be done in close coordination with the Installation POC in order to follow all Detachment Fallbrook waste management policies and protocols.

If any additional waste type is identified during the course of the project requiring a different disposal technique, procedures for waste management and disposal will be developed and the Work Plan will be amended.

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7.0 SPILL CONTROL, RESPONSE, PREVENTION, AND MINIMIZATION

Because of the nature of this project, spills or release of material into the environment during the course of field activities is extremely unlikely. No fueling operations or storage of any sizeable amounts of liquids will take place during the conduct of this project.

However, all spills, leaks, and fires involving oil or hazardous substances must be reported to the Installation POC, the RPM, and the PESM. The person reporting the leak, spill or fire is required to provide the following information:

- His/her name
- Location of spill and facility number, if known
- Number of injured personnel and nature of injuries, if known
- Substance spilled
- Amount spilled (estimate)
- Extent of spill
- Rate that substance is currently being released (estimate)
- Time spill occurred (estimate)
- Duration of release
- Any other pertinent information

The RPM and/or Installation POC, in coordination with the PjM, will manage notifications to regulatory agencies. In addition, all spills will be reported to the TtEC Environmental Compliance Manager or PESM. Project personnel will not report spills directly to any agency, unless specifically requested by the RPM or Contracting Officer.

A minor spill involving no immediate threat to human health or the environment (would cause minimal property damage and does not exceed the reportable quantity for that material) would require the responsible or witnessing person to notify the Installation POC, the RPM, and the PjM, and supply the responders with as much information as possible.

In the case of a spill of contaminated or hazardous materials, the following procedures will be followed:

- Notify the Superintendent
- Identify protective clothing or equipment required to respond
- Contain the spill

- Neutralize and/or solidify any product
- Transfer material into 55-gallon drums
- Document incident

All site personnel will be trained in spill response, notification, and minimization techniques at the start of fieldwork. The following procedures will be implemented to prevent and minimize releases of hazardous materials:

- Do not conduct hazardous materials operation when the weather could cause significant risk to the surrounding area if a spill should occur.
- Transfer all materials in or over a bermed or "protected" area. A protected area is one covered with an impermeable material, such as polyethylene.
- Dike temporary storage tanks containing hazardous wastes or potentially hazardous wastes to contain potential releases.
- Maintain a supply of basic spill response materials and protective equipment on site including:
  - Absorbent sheets, pillows, booms, or absorbent material
  - Open-top 55-gallon drums or other containers with lids
  - Booms, shovels, and other tools, such as squeegees

8.0 PROJECT QUALITY CONTROL

QC requirements for this project will be accomplished in accordance with the *Contractor Quality Control Program Plan* (TtEC, 2006b) and this Work Plan.

8.1 DEFINABLE FEATURES OF WORK

The DFWs establish the measurements required to verify both the quality of work performed and compliance with specific requirements and include inspecting materials and workmanship before, during, and after each DFW. Table 6-1, Definable Features of Work, presents each DFW with summaries of the three-phase inspection process.

8.2 QC MEETINGS

After the start of field activities, the PQCM will conduct QC meetings at a frequency of once per week or as required by the DON. The meetings will be held at the project site. Attendees include, but are not limited to, Installation POC, RPM, PjM, the Site Superintendent, the SHSS, and the PQCM. The PQCM will notify the Installation POC at least 24 hours in advance of each meeting. The following will be discussed at each meeting:

- Review the minutes of the previous meeting
- Review the schedule
  - Work or testing accomplished since last meeting
  - Rework items identified since last meeting
  - Rework items completed since last meeting
- Review the status of submittals
  - Submittals reviewed and approved since last meeting
  - Submittals required in the near future
- Review the work to be accomplished in the following 2 weeks and documentation required; schedule the three phases of control and testing
  - Establish completion date for rework items
  - Required preparatory phase inspections
  - Required initial phase inspections
  - Required follow-up phase inspections
  - Required testing
  - Status of off-site work or testing
  - Required documentation
- Resolve QC and production problems

8.3 INSPECTION PROCESS

8.3.1 Preparatory Phase Inspection

The PQCM will conduct preparatory phase inspections prior to starting the DFWs listed in Table 6-1. These inspections will include the following:

- Reviewing the Work Plan and drawings
- Ensuring that materials and/or equipment have been tested, submitted, and approved
- Ensuring that provisions have been made to provide required control inspection and testing
- Examining the work area to ensure that required preliminary work has been completed and is in compliance with the approved requirements
- Ensuring that all personnel have the required trainings/certifications needed to perform work
- Conducting a physical examination of the required materials and equipment to ensure that they are properly delivered to the site, conform to approved shop drawings or specifications, and are properly stored
- Reviewing the appropriate AHA to ensure that safety requirements are met
- Discussing procedures for performing the work, including potential repetitive deficiencies
- Ensuring that the Work Plan has been accepted by the DON

The PjM, RPM, and Installation POC shall be notified at least 2 working days in advance of preparatory phase inspection activity. This phase shall include a meeting conducted by the PQCM and attended by the Site Superintendent and any other personnel involved in performing the DFW.

The issues discussed during the preparatory phase meetings will be documented on the Preparatory Inspection Checklist. The PQCM will direct personnel performing work activities as to the acceptable level of workmanship required.

8.3.2 Initial Phase Inspection

An initial inspection will be performed at the beginning of a DFW and will include the following:

- A check of preliminary work to ensure that it is in compliance with requirements
- A review of the Inspection Checklist documenting results of the preparatory phase meeting

- Verification of full contract compliance, including required control inspection and testing
- Establishment of the required level of workmanship and verification to ensure that work meets minimum acceptable standards

The PjM, RPM, and Installation POC will be notified at least 2 working days in advance of any initial phase inspection activity. The PQCM will document initial inspections for each item using the Initial Inspection Checklist and attach it to the daily CQC Report. The exact location of the initial phase inspection will be indicated for future reference and comparison with follow-up inspections.

An initial phase inspection will be conducted each time a new crew arrives on site or any time acceptable specified quality standards are not being met.

8.3.3 Follow-up Phase Inspection

During the completion of a particular work feature, follow-up inspections will be conducted to ensure continued compliance with contract requirements. The frequency of the follow-up inspections will depend on the extent of the work being performed on each particular feature. Each follow-up inspection will be documented on the Follow-up Inspection Checklist, which will be attached to the daily CQC Report. A final follow-up check will be conducted on each completed work phase prior to the commencement of a subsequent phase. Any deficiencies will be corrected prior to starting additional phases of work or will be identified on a list of items that do not conform to the specified requirements or are incomplete.

8.3.4 Additional Preparatory and Initial Phases

The PQCM may conduct additional preparatory and initial inspections on the same DFWs under the following circumstances:

- If the quality of ongoing work is unacceptable as determined by the PQCM, SHSS, PjM, or representatives from the DON
- If there are substantial changes in the staff, on-site supervision, or work crew
- If work on a DFW is resumed after a substantial period of inactivity
- If other problems develop
- If new tasks arise

8.3.5 Completion Inspection

Completion inspections will be performed as summarized in this section.

8.3.5.1 Field Quality Control Completion Inspections

The PQCM or designee will conduct a preliminary inspection prior to the pre-final inspection, when all of the work or an increment of work is deemed to be substantially complete. The work will be inspected for conformance to plans, specifications, quality, and completeness. The PQCM will prepare a rework items list of work not properly completed or work that does not conform to plans and specifications. The list will be included in the QC documentation and submitted to the PjM following the inspection and will specify an estimated date for correction of each deficiency. The completion inspection will be documented on the Completion Inspection Checklist and attached to the daily QC Report.

8.3.5.2 Pre-final Inspection

The PjM will conduct the pre-final inspection. The RPM, Installation POC, PQCM, and other primary management representative(s), as applicable, will attend. The PjM will schedule the pre-final inspection in response to notification from the PQCM prior to the planned inspection date. The PQCM is required to verify at this time that all specific items previously identified as being unacceptable, along with all remaining project work, will be complete and acceptable by the scheduled date for the pre-final inspection. At this inspection, the RPM will develop a list of incomplete and/or unacceptable work performed under the contract and will provide this list to the TtEC site management team.

8.3.5.3 Final Acceptance Inspection

The PjM will schedule the final acceptance inspection based on notification of readiness from the Superintendent. The RPM, Installation POC, PQCM, and other primary management representative(s), as applicable, will attend. Notification will be provided prior to the planned final acceptance inspection date and must include verification that all specific items previously identified as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection.

8.3.5.4 Inspection Documentation

The PQCM is responsible for the maintenance of the inspection records. Inspection records will be legible and clearly provide all necessary information to verify that the items or activities inspected conform to the specified requirements or, in the case of nonconforming conditions, provide evidence that the conditions were brought into conformance or otherwise accepted by the Installation POC. All inspection records will be made available to the DON.

8.4 NONCONFORMANCES

The PQCM documents any work or materials not conforming to the technical specifications or project/contract requirements on an NCR (Appendix C). The NCR will detail the nonconforming

condition, the recommended corrective action(s), and the disposition of the corrective action(s). Qualified representatives from engineering, quality assurance, and construction will review the NCR and either accept or reject the recommended corrective action or disposition. The NCR will remain open until the nonconforming condition has been satisfactorily resolved and verified by the PQCM. Upon receipt of notification of detected nonconformance completion, an evaluation and acceptance report will be issued.

8.4.1 Identification of Nonconforming Items

Items identified as nonconforming will be documented in accordance with the TtEC corporate Quality Program (QP)-11 procedure, Control of Nonconforming Conditions. Copies of completed NCRs will be sent to the Installation POC.

An NCR log that describes all NCRs will be maintained for each week during the project. If no NCRs were issued during a particular week, the appropriate column will be filled in with the week ending date. A sample NCR form and NCR log are included Appendix C.

8.4.2 Condition Requiring Stop Work Order

If corrective actions are insufficient, resolution cannot be reached, or a notice of non-response or results of prior work are indeterminate, work may be stopped by the PjM and PQCM in writing. An immediate Stop Work Order can be issued by anyone for health and safety issues. If there is a disagreement between the PQCM and the PjM, the difference will be brought to the attention of the QCM until resolution us achieved.

The conditions of the Stop Work Order will be described in detail on a rework items list in addition to NCR to allow evaluation of the problem(s) and proper corrective action(s). Work will not continue until the Stop Work Order has been resolved by the PjM and documented.

8.4.3 Nonconformance Report Log

The PQCM will maintain an NCR log that provides the NCR number, a brief description of the nonconforming condition, date of issue, point of contact to resolve, date of anticipated corrective action, and date closed.

8.4.4 Nonconforming Items

The nonconforming items will be controlled to prevent inadvertent use of material or workmanship quality. All items noted as nonconforming will be clearly identified and segregated from acceptable items, when practical as described in the QP-11 procedure.

8.4.5 Disposition

The disposition of NCRs will include the necessary actions required to bring the nonconforming condition to an acceptable condition and may include reworking, replacing, retesting, or reinspecting. Implementation of the disposition may be done in accordance with the original procedural requirements, a specific instruction, or an approved FCR.

8.4.6 Field Change Requests and Design Change Notices

Site personnel shall document changes to the approved plans in the field through the FCR form. At a minimum, the following information will be documented in the field change request (FCR) form:

- Project name
- CTO number
- FCR number
- Documents to which a change is requested (including revision number, if applicable
- Description of the item or condition for which the change is requested
- Reason for the change
- Recommended disposition
- Cost and schedule implication of the change, if any
- Approval of discipline lead for changes involving risk-sensitive changes pertinent to that discipline
- Approval of the PjM, PQCM, and PESM, QCM

8.4.7 Corrective Actions

On detection of a nonconforming condition, the PQCM will immediately take corrective action. The procedure for identification, analysis, and implementation of corrective action is described in the QP-12 procedure, Corrective Action, which discusses actions to be taken to identify the cause of the nonconformance or deficiency. When the cause of the problem has been identified, appropriate corrective action(s) can be implemented, and monitored to determine the effectiveness of that action. In addition to resolving identified nonconforming conditions, corrective action records will also address the initial cause of adverse conditions and establish methods and controls to prevent reoccurrence of the same or similar types of nonconformances. The PQCM will monitor the corrective actions to verify that they were properly implemented and accepted and that the original NCR was closed out.

9.0 REFERENCES

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Knight, Robert N. 2004. Conservation Program Manager, Department of the Navy, Naval Weapons Station Seal Beach Detachment Fallbrook. *Site and Species Description for IRP MRP Site UXO5, Naval Weapons Station Seal Beach Detachment Fallbrook* (Ser N45WK/0096). Recipient: Karen Goebel, Assistant Field Supervisor, U.S. Fish and Wildlife Service. June 1.

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Tetra Tech EC, Inc. (TtEC). 2005. TtEC Procedure UXO-4. *General UXO Safety Precautions.* September 7.

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TABLES

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TABLE 1-1

MUNITIONS TYPES/CATEGORIES DESCRIPTIONS

Type of Material	What is it BEFORE it is inspected for explosives hazards[2]?		What is it AFTER it is inspected for explosive hazards...					
			and it presents explosive hazards?			and it does not present explosive hazards?		
			MEC					
	MPPEH	Other	UXO	DMM [3]	MC [4]	MC[5]	Munitions Debris	Other
Used military munition, on a range, fired	X		X				X	
Unused military munition, on a range, apparently discarded	X			X			X	
Used military munition, in a burial pit, on an operational range or on former ranges	X		X[6]				X	
Unused military munition, in a burial pit on an operational range or on former ranges	X			X[6]			X	
Explosives in the soil	X				X[7]	X		
Refrigerator, nails, soft drink cans, old fence wire, etc.		(8)	NA	NA	NA			(8)
Used cartridge cases, from a range, with live unused munitions possibly mixed in	X			X			(9)	
Target from a range (other than small arms range)	X		(10)	(10)	(10)			(11)
Remnants of munitions from an operational range or former range	X		X[12]	X[12]	X[12]		X[13]	
Kicked out military munition from a former open burn or open detonation ground	X			X[14]			X	
Residual MC in a melt kettle of a former (closed) explosive cast loading building	X		(15)	(15)	X[15]	X		X[16]
Residual MC in a floor drain pipe from an explosives-laden wash water drain of a former (closed) explosives cast loading facility.	X		(15)	(15)	X[15]			X[16]
Residual MC in cracks in floor slab (and in soil underneath floor cracks) in a former explosives manufacturing building	X		(15)	(15)	X[15]	X		X[16]
Small arms bullets or lead particulates in the soil from small arms use at a former small arms range used only for firing small arms ammunition		X[17]	NA[17]			X		

TABLE 1-1

MUNITIONS TYPES/CATEGORIES DESCRIPTIONS

Notes:

DMM – discarded military munitions
DoD – Department of Defense
EOD – Explosive Ordnance Disposal
HMX – octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
MC – munitions constituents
MEC – munitions and explosives of concern
MPPEH – munitions presenting potential explosive hazards
NA – not applicable
QASAS – quality assurance/surveillance ammunition specialist
RDX - hexahydro-1,3,5-trinitro-1,3,5-trazine
TNT - 2,4,6-trinitrotoluene
UXO – unexploded ordnance

The examples in this table are not all inclusive. The numbers in the table refer to the following notes. It is important to read the notes, as they provide additional information of importance to understanding.

(1) DoD has been working to standardize terms related to military munitions. The majority of the terms addressed in this matrix apply to the military munitions response program. However, many also apply to other areas (e.g., operational ranges) outside that program.
(2) Before material that is considered MPPEH can be either transferred within or released from DoD, its explosives safety status must be determined (see definition--Documentation of the Explosives Safety Status of Material). The type material involved determines the type of inspection (e.g., visual examination, chemical analysis, X-ray) required. Personnel qualified to determine the status of the particular material being examined must perform required inspections. For example, EOD and UXO-qualified personnel may inspect UXO and DMM during a munitions response or during range clearance activities. A QASAS or certified Wage Grade ammunition operator may inspect steamed-out projectiles at a depot's steam-out operation. A laboratory technician may perform a chemical analysis of soil to determine the percent explosives in the soil.
(3) Munitions generally considered as DMM include buried munitions; un-recovered kick-outs from open detonations; munitions left behind or discarded accidentally during munitions-related activities; munitions intentionally disposed of without authorization during munitions-related activities. Munitions removed from storage for the purpose of disposal that are awaiting disposal are not DMM.
(4) This is MC that is both (a) an explosive; and (b) present in sufficient concentrations to present explosive hazards.
(5) This is MC that is either (a) not an explosive (e.g., lead, beryllium, and cadmium); or (b) an explosive not present in sufficient concentrations to present explosive hazards.
(6) Although military munitions in a burial pit will normally be DMM, some may be UXO. For explosives safety reasons, munitions in a burial pit should be approached as UXO until assessed by technically qualified personnel (e.g., EOD personnel, UXO-qualified personnel) and determined that they are not UXO or that they do not present explosive hazards similar to UXO.
(7) Explosive soil is typically found in sumps and settling lagoons for explosives-laden wastewater, and in and around drainage ditches and pipes that carry the wastewater to such sumps and lagoons.
(8) These items are cultural debris.
(9) After determination of their explosives safety status, used cartridge cases documented as safe would, after any demilitarization required to remove their military characteristics, be available for release from DoD. In additions to these DoD requirements, other regulatory criteria may apply.

TABLE 1-1

MUNITIONS TYPES/CATEGORIES DESCRIPTIONS

(10) A target is a type of range-related debris. Although a target is not MEC, it may contain UXO, DMM, or MC. Prior to its release from DoD control, its explosives safety status must be documented.
(11) A target's explosives safety status must be documented and any demilitarization required to remove its military characteristics must be performed prior to its release from DoD control.
(12) UXO, DMM, or MC may be found on operational ranges and on former ranges (previously referred to as closed, transferring or transferred ranges). An inspection of the material will determine into which category this material falls. For example, if a projectile breaks apart on impact, one could find (a) a sheared-off fuze, which would be UXO or (b) explosive filler, which would be MC that broke away from the projectile's open body. If during an open detonation of an unserviceable munition that is conducted on an operational range, the donor charge detonates, but the munition being destroyed breaks up, but does not detonate, the remnants of the munition would be DMM or, if explosive residue (e.g., clumps of TNT), MC.
(13) After determination of its explosives safety status, scrap metal from used munitions on a range documented as safe would, after any demilitarization required to remove its military characteristics, be available for release from DoD control. In additions to these DoD requirements, other regulatory criteria may apply.
(14) Prudent safety practice is to consider kick-outs, which have experienced an unknown environment, to be equally dangerous and managed like UXO until technically qualified personnel assess and determine that they are not UXO or do not present explosive hazards similar to UXO.
(15) Of itself, such material (e.g., mettle kettle, drainpipes, floor slabs) do not present an explosive hazard and would not be classified as UXO, DMM or MC. However, residual MC (e.g., TNT, RDX, HMX) could remain in such material in high enough concentrations to present an explosive hazard.
(16) After determination of its explosives safety status, such material (e.g., mettle kettle, drainpipes, floor slabs) when documented as safe would be available for release from DoD control. In addition to this DoD requirement, other regulatory criteria may apply.
(17) At operational ranges or former ranges used exclusively for live fire of small arms ammunition, some unfired small arms ammunition may be found. Although this ammunition is considered DMM and would be MPPEH, it is not considered to present a significant explosive hazard.

Consolidated Military Munitions Response Program Definitions

Anomaly Avoidance. Techniques employed on property known or suspected to contain MEC, or CWM in OTM configurations to avoid contact with potential surface or subsurface explosive or CA hazards, to allow entry to the area for the performance of required operations.

Chain-of-Custody. The activities and procedures taken throughout the inspection, re-inspection and documentation process to maintain positive control of MPPEH to ensure the veracity of the process used to determine the status of material as to its explosive hazard. This includes all such activities from the time of collection through final disposition.

Chemical Agent (CA). CA means an agent that, through its chemical properties, produces lethal or other damaging effects on human beings, except that such term does not include riot control agents, chemical herbicides, smoke and other obscuration materials.

Chemical Agent (CA) Hazard. A condition where danger exists because CA is present in a concentration high enough to present potential unacceptable effects (e.g., death, injury, damage) to people, operational capability, or the environment.

Chemical Warfare Material (CWM). Items generally configured as a munition containing a chemical substance that is intended to kill, seriously injure, or incapacitate a person through its physiological effects. CWM includes V- and G-series nerve agents or H-series (mustard) and L-series (lewisite) blister agents in other-than-munition configurations; and certain industrial chemicals (e.g., hydrogen cyanide (AC), cyanogen chloride (CK), or carbonyl dichloride (called phosgene or CG)) configured as a military munition. Due to their hazards, prevalence, and military-unique application, chemical agent identification sets (CAIS) are also considered CWM. CWM does not include: riot control devices; chemical herbicides; industrial chemicals (e.g., AC, CK, or CG) not configured as a munition; smoke and flame producing items; or soil, water, debris or other media contaminated with low concentrations of chemical warfare agents where no CA hazards exist.

Chemical Warfare Material (CWM) Response. Munitions responses and other responses to address the chemical safety; explosives safety, when applicable; human health; or environmental risks presented by CWM regardless of configuration. (See munitions response.)

TABLE 1-1

MUNITIONS TYPES/CATEGORIES DESCRIPTIONS

Construction Support. Assistance provided by DoD, EOD or UXO-qualified personnel and/or by personnel trained and for operations involving CWM Qualified during intrusive construction activities on property known or suspected to contain MEC, or CWM in OTM configurations to ensure the safety of personnel or resources from any potential explosive or CA hazards.

Chemical Agent (CA) Safety. A condition where operational capability and readiness, people, property, and the environment are protected from the unacceptable effects or risks of a mishap involving chemical warfare material (CWM).

Cultural Debris. Debris found on operational ranges or munitions response sites, which may be removed to facilitate a range clearance or munitions response, that is not related to munitions or range operations. Such debris includes, but is not limited to: rebar, household items (refrigerators, washing machines, etc.), automobile parts and automobiles that were not associated with range targets, fence posts, fence wire, and magnetic rocks.

Defense Sites. Locations that are or were owned by, leased to, or otherwise possessed or used by the DoD. The term does not include any operational range, operating storage or manufacturing facility, or facility that is used for or was permitted for the treatment or disposal of military munitions. [10 USC 2710(e)(1)]

Discarded Military Munitions (DMM). Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded ordnance, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of consistent with applicable environmental laws and regulations. [10 USC 2710(e)(2)]

Disposal. End of life tasks or actions for residual materials resulting from demilitarization or disposition operations.

Disposition. The process of reusing, recycling, converting, redistributing, transferring, donating, selling, demilitarizing, treating, destroying, or fulfilling other life-cycle guidance, for DoD property.

Documentation of the Explosives Safety Status of Material. Documentation recording that material: (1) does not present an explosive hazard and is consequently safe for unrestricted transfer within or release from DoD control or (2) is MPPEH, with the stated known or suspected explosive hazards, and is consequently is only transferable or releasable to a qualified receiver. This documentation must be signed by a technically qualified individual with direct knowledge of: (1) the results of both the 100 percent inspection and 100 percent re-inspection, and (2) the chain-of-custody of the material originally classified as MPPEH. This certification is followed by a verification signed by a technically qualified individual who inspects the material on a sampling basis (sampling procedures are determined by DoD entity that is generating the MPPEH).

Environmental Regulators and Safety Officials. Include, but may not be limited to environmental regulators, environmental coordinators or hazardous material coordinators, law enforcement officers, and safety personnel of the U.S. Environmental Protection Agency (EPA), American Indians and Alaska Natives, other Federal Land Managers, and/or the States. When appropriate, public health officials of various agencies may also be involved.

Explosive Hazard. A condition where danger exists because explosives are present that may react (e.g., detonate, deflagrate) in a mishap with potential unacceptable effects (e.g., death, injury, damage) to people, property, operational capability, or the environment.

Explosive Ordnance Disposal (EOD). The detection, identification, on-site evaluation, rendering safe, recovery, and final disposal of unexploded ordnance and of other munitions that have become hazardous by damage or deterioration.

Explosive Ordnance Disposal (EOD) Personnel. Military personnel who have graduated from the Naval School, Explosive Ordnance Disposal; are assigned to a military unit with a Service-defined EOD mission; and meet Service and assigned unit requirements to perform EOD duties. EOD personnel have received specialized training to address explosive and certain CA hazards during both peacetime and wartime. EOD personnel are trained and equipped to perform Render Safe Procedures (RSP) on nuclear, biological, chemical, and conventional munitions, and on improvised explosive devices.

TABLE 1-1

MUNITIONS TYPES/CATEGORIES DESCRIPTIONS

Explosive Ordnance Disposal (EOD) Unit. A military organization constituted by proper authority; manned with EOD personnel; outfitted with equipment required to perform EOD functions; and assigned an EOD mission.

Explosives or Munitions Emergency Response. All immediate response activities by an explosives and munitions emergency response specialist to control, mitigate, or eliminate the actual or potential threat encountered during an explosives or munitions emergency, An explosives or munitions emergency response may include in-place render-safe procedures, treatment or destruction of the explosives or munitions, and/or transporting those items to another location to be rendered safe, treated, or destroyed. Any reasonable delay in the completion of an explosives or munitions emergency response caused by a necessary, unforeseen, or uncontrollable circumstance will not terminate the explosives or munitions emergency. Explosives and munitions emergency responses can occur on either public or private lands and are not limited to responses at RCRA facilities. (Military Munitions Rule, 40 CFR 260.10)

Explosives Safety. A condition where operational capability and readiness, people, property, and the environment are protected from the unacceptable effects or risks of potential mishaps involving military munitions.

Interim Holding Facility (IHF). A temporary storage facility designed to hold recovered chemical warfare material (RCWM) pending transportation for off-site treatment or storage, or on-site treatment.

Land Use Controls (LUC). LUC are physical, legal, or administrative mechanisms that restrict the use of, or limit access to, real property to manage risks to human health and the environment. Physical mechanisms encompass a variety of engineered remedies to contain or reduce contamination and/or physical barriers to limit access to real property, such as fences or signs.

Long-term Management (LTMgt). The period of site management (including maintenance, monitoring, record keeping, 5-year reviews, etc.) initiated after response (removal or remedial) objectives have been met (i.e., after Response Complete).

Material Potentially Presenting an Explosive Hazard (MPPEH). Material potentially containing explosives or munitions (e.g., munitions containers and packaging material; munitions debris remaining after munitions use, demilitarization, or disposal; and range-related debris); or material potentially containing a high enough concentration of explosives such that the material presents an explosive hazard (e.g., equipment, drainage systems, holding tanks, piping, or ventilation ducts that were associated with munitions production, demilitarization or disposal operations). Excluded from MPPEH are munitions within DoD's established munitions management system and other hazardous items that may present explosion hazards (e.g., gasoline cans, compressed gas cylinders) that are not munitions and are not intended for use as munitions.

Military Munitions. Military munitions means all ammunition products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the DoD, the U.S. Coast Guard, the U.S. Department of Energy, and the National Guard. The term includes confined gaseous, liquid, and solid propellants, explosives, pyrotechnics, chemical and riot control agents, smokes and incendiaries, including bulk explosives, and chemical warfare agents, chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges, and devices and components of the above. The term does not include wholly inert items, improvised explosive devices, and nuclear weapons, nuclear devices, and nuclear components, other than non-nuclear components of nuclear devices that are managed under the nuclear weapons program of the Department of Energy after all required sanitization operations under the Atomic Energy Act of 1954 (42 USC 2011 et seq.) have been completed. (10 USC 101(e)(4)(A) through (C))

Minimum Separation Distance (MSD). MSD is the distance at which personnel in the open must be from an intentional or unintentional detonation.

Mutual Agreement. A meeting of the minds on a specific subject, and a manifestation of intent or refrain from doing some parties specific act or acts. Inherent in any mutual agreement or collaborative process are the acknowledgment of each member's role in the process and their differing views of their authorities. The mutual agreement process will provide a means of resolving differences without denying the parties an opportunity to exercise their respective authorities should mutual agreement fail to be achieved.

TABLE 1-1

MUNITIONS TYPES/CATEGORIES DESCRIPTIONS

Munitions and Explosives of Concern (MEC). This term, which distinguishes specific categories of military munitions that may pose unique explosives safety risks means: (A) Unexploded ordnance (UXO), as defined in 10 USC 101(e)(5)(A) through (C); (B) Discarded military munitions (DMM), as defined in 10 USC 2710(e)(2); or (C) Munitions constituents (e.g., TNT, RDX), as defined in 10 USC 2710(e)(3), present in high enough concentrations to pose an explosive hazard.

Munitions Constituents (MC). Any materials originating from unexploded ordnance, discarded military munitions, or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions. (10 USC 2710).

Munitions Debris. Remnants of munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal.

Munition with the Greatest Fragmentation Distance (MGFD). The munition with the greatest fragment distance that is reasonably expected (based on research or characterization) to be encountered in any particular area.

Munitions Response. Response actions, including investigation, removal actions and remedial actions to address the explosives human health, safety or environmental risks presented by unexploded ordnance (UXO), discarded military munitions (DMM), or munitions constituents (MC).

Munitions Response Area (MRA). Any area on a defense site that is known or suspected to contain UXO, DMM, or MC. Examples include former ranges and munitions burial areas. A munitions response area is comprised of one or more munitions response sites.

Munitions Response Site (MRS). A discrete location within an MRA that is known to require a munitions response.

One Percent Lethality Distance. A distance calculated from a given CA MCE and meteorological conditions (temperature, wind speed, Pasquill factor) stability and established as the distance at which dosage from that MCE agent release would be 150 mg-min/m ^{3} for H and HD agents, 75 mg-min/m^3 for HT agent, 150 mg-min/m^3 for Lewisite, 10 mg-min/m^3 for GB agent, 4.3 mg-min/m for VX vapor, and 0.1 mg-min/m^3 for inhalation and deposition of liquid VX.

On-call Construction Support. Support provided, on an as needed basis, by DoD, EOD or UXO-qualified personnel and/or by trained for personnel and qualified operations involving CWM during intrusive construction activities on property known or suspected to contain MEC or CWM in OTM configurations, where the probability of encountering such has been determined to be low. This support can respond from off-site when called, or be on-site and available to provide required construction support.

On-site Construction Support. Dedicated support provided by DoD, EOD or UXO-qualified personnel and/or by trained and for personnel qualified operations involving CWM during intrusive construction activities on property known or suspected to contain MEC, or CWM in OTM configurations, where the probability of encountering such has been determined to be moderate to high.

On-call UXO Construction Support. Support provided, on an as needed basis, by DoD, EOD or UXO-qualified personnel during intrusive construction. Personnel activities on property known or suspected to contain UXO or other munitions that have experienced abnormal environments where the probability of encountering such has been determined to be low. This support can respond from off site when called, or be on site and available to provide required construction support.

On-site UXO Construction Support. Dedicated support provided by DoD, EOD or UXO-qualified personnel during construction activities unknown Property or suspected to contain UXO or other munitions that have experienced abnormal environments where the probability of encountering such has been determined to be moderate to high.

On-the-Surface. A situation in which UXO, DMM or CWM are: (A) entirely or partially exposed above the ground surface (i.e., the top of the soil layer); or (B) entirely or partially exposed above the surface of a water body (e.g., because of tidal activity).

Open Burn (OB). An open-air combustion process by which excess, unserviceable, or obsolete munitions are destroyed to eliminate their inherent explosive hazards.

Open Detonation (OD). An open-air process used for the treatment of excess, unserviceable or obsolete munitions whereby an explosive donor charge initiates the munitions being treated.

TABLE 1-1

MUNITIONS TYPES/CATEGORIES DESCRIPTIONS

Operational Range. A range that is under the jurisdiction, custody, or control of the Secretary of Defense and that is used for range activities; or although not currently being used for range activities, that is still considered by the Secretary to be a range and has not been put to a new use that is incompatible with range activities. [10 USC 101(e)(3)(A) and (B)]. Also includes "military range," "active range," and "inactive range" as those terms are defined in 40 CFR 266,201. (See reference (f)).

Primary Explosives. Primary explosives are highly sensitive compounds that are typically used in detonators and primers. A reaction is easily triggered by heat, spark, impact or friction. Examples of primary explosives are lead azide and mercury fulminate.

Public Access Exclusion Distance (PAED). The PAED is defined as longest distance of the hazardous fragment distance, IBD for overpressure, or the One Percent Lethality Distance. For siting purposes, the PAED is analogous to the IBD for explosives; therefore, personnel not directly associated with the chemical operations are not to be allowed within the PAED.

Qualified Receiver. Entities that have personnel who are, or individuals who are, trained and experienced in the identification and safe handling of used and unused military munitions, and any known or potential explosive hazards that may be associated with the MPPEH they receive; and are licensed and permitted or otherwise qualified to receive, manage, and process MPPEH.

Range. A designated land or water area that is set aside, managed, and used for range activities of the DoD. The term includes firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, electronic scoring sites, buffer zones with restricted access, and exclusionary areas. The term also includes airspace areas designated for military use in accordance with regulations and procedures prescribed by the Administrator of the Federal Aviation Administration. [10 USC 101(e)(1)(A) and (B)]

Range activities. Research, development, testing, and evaluation of military munitions, other ordnance, and weapons systems; and the training of members of the armed forces in the use and handling of military munitions, other ordnance, and weapons systems. [10 USC 101(e)(2)(A) and (B)]

Range Clearance. The recovery, collection, and on-range destruction of used military munitions (e.g., UXO), munitions debris, and other range-related debris (e.g., targets) on operational ranges to maintain or enhance operational safety or to sustain the continued use of the range for its intended purpose. The term "range clearance" does not include the on-range disposal or burial of military munition and munitions constituents, when the burial is not a result of normal use.

Range-Related Debris. Debris, other than munitions debris, collected from operational ranges or from former ranges (e.g., targets).

Render Safe Procedures (RSP). The portion of EOD procedures that involves the application of special disposal methods or tools to interrupt the functions or separate the essential components of UXO to prevent an unacceptable detonation.

Secondary Explosives. Secondary explosives are generally less sensitive to initiation than primary explosives and are typically used in booster and main charge applications. A severe shock is usually required to trigger a reaction. Examples are TNT, cyclo-1,3,5-trimethylene-2,4,6-trinitramine (RDX or cyclorrite), HMX, and tetryl.

Small Arms Ammunition. Ammunition, without projectiles that contain explosives (other than tracers), that is .50 caliber or smaller, or for shotguns.

Team Separation Distance (TSD). The distance that munitions response teams must be separated from each other during munitions response activities involving intrusive operations.

Technical Escort Unit (TEU). A DoD organization manned with specially trained personnel that provide verification, sampling, detection, mitigation, render safe, decontamination, packaging, escort and remediation of chemical, biological and industrial devices or hazardous material.

Technology-aided Surface Removal. A removal of UXO, DMM or CWM on the surface (i.e., the top of the soil layer) only, in which the detection is process primarily performed visually, but is augmented by technology aids (e.g., hand-held magnetometers or metal detectors) because vegetation, the weathering of UXO, DMM or CWM, or other factors make visual detection difficult.

Time Critical Removal Action (TCRA). Removal actions where, based on the site evaluation, a determination is made that a removal is appropriate, and that less than 6 months exists before on-site removal activity must begin. (40 CFR 300.5)

TABLE 1-1

MUNITIONS TYPES/CATEGORIES DESCRIPTIONS

Unexploded Ordnance (UXO). Military munitions that (A) have been primed, fuzed, armed, or otherwise prepared for action; (B) have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and (C) remain unexploded either by malfunction, design, or any other cause. [10 USC 101(e)(5)(A) through (C)].

UXO Avoidance. Techniques employed on property known or suspected to contain UXO or other munitions that have experienced abnormal environments, to avoid contact with potential explosive or CA hazards, to allow entry to the area for the performance of required operations.

UXO technicians. Personnel who are qualified for and filling Department of Labor, Service Contract Act, Directory of Occupations, contractor positions of UXO technician I, UXO technician II, and UXO technician III.

UXO-Qualified Personnel. Personnel who have performed successfully in military EOD positions, or are qualified to perform in the following Department of Labor, Service Contract Act, Directory of Occupations, contractor positions: UXO technician II, UXO technician III, UXO Safety Officer, UXO Quality Control Specialist, or Senior UXO Supervisor.

Venting. Exposing any internal cavities of MPPEH, to include training or practice munitions (e.g., concrete bombs), using DDESB- or DoD Component-approved procedures, to confirm that an explosive hazard is not present.

TABLE 3-1

LIST OF KEY PROJECT CONTACTS

Agency	Contact	Project Title
NAVFAC SW 1220 Pacific Highway San Diego, CA 92132-5190	Mr. Si Le (619) 532-2295 si.t.le@navy.mil	RPM
NAVWPNSTA Seal Beach Code N45W, Building 110 800 Seal Beach Boulevard Seal Beach, CA 90740-5000	Ms. Pei-Fen Tamashiro (562) 626-7897 pei-fen.tamashiro@navy.mil	Installation POC
NAVFAC SW 1220 Pacific Highway San Diego, CA 92132-5190	Ms. Marilyn Hamer (619) 532-3929 marilyn.hamer@navy.mil	Contract Specialist
NAVWPNSTA Seal Beach Detachment Fallbrook 700 Ammunition Road Fallbrook, CA 92028	Mr. Jim Oliver (760) 731-3612 oliver.james.m@navy.mil	ESO
NAVFAC SW 1220 Pacific Highway San Diego, CA 92132-5190	Mr. Narciso Ancog (619) 532-3046 narciso.ancog@navy.mil	Quality Assurance Officer
NAVWPNSTA Seal Beach Detachment Fallbrook 700 Ammunition Road Fallbrook, CA 92028	Ms. Christy Wolf (760) 731-3425 christy.wolf@navy.mil	Conservation Program Manager
TtEC 1230 Columbia Street, Suite 750 San Diego, CA 92101-8536	Mr. Kent Weingardt (619) 471-3532 cell (619) 606-0229 kent.weingardt@tteci.com	PjM
TtEC 1230 Columbia St., Suite 750 San Diego, CA 92101-8536	Mr. Lance Humphrey (619) 471-3519 lance.humphrey@tteci.com	UXO Coordinator/PQCM
TtEC 1940 East Deere Avenue, Suite 200 Santa Ana, CA 92705-5718	Ms. Mary Schneider (949) 756-7586 cell (714) 620-4551 mary.schneider@tteci.com	PQM
TtEC 1940 East Deere Avenue, Suite 200 Santa Ana, CA 92705-5718	Ms. Lisa Bienkowski (949) 756-7592 lisa.bienkowski@tteci.com	Program Chemist
TtEC 1230 Columbia St., Suite 750 San Diego, CA 92101-8536	Mr. Roger Margotto, CIH, CSP, CHMM (619) 471-3503 cell (619) 988-0520 roger.margotto@tteci.com	PESM

TABLE 3-1

LIST OF KEY PROJECT CONTACTS

Agency	Contact	Project Title
TtEC 1230 Columbia St., Suite 750 San Diego, CA 92101-8536	Mr. Anthony Crino Cell (619) 206-3344 anthony.crino@tteci.com	SUXOS/SHSS

Notes:

CIH – Certified Industrial Hygienist
CHMM – Certified Hazardous Materials Manager
CSP – Certified Safety Professional
ESO – Explosive Safety Officer
NAVFAC SW – Naval Facilities Engineering Command, Southwest
NAVWPNSTA – Naval Weapons Station
PESM – Program Environmental Safety Manager
PjM – Project Manager
PQM – Program Quality Control Manager
PQCM – Project Quality Control Manager
POC – Point of Contact
RPM – Remedial Project Manager
TtEC – Tetra Tech EC, Inc.
SUXOS – Senior Unexploded Ordnance Supervisor
UXO – unexploded ordnance

TABLE 4-1

ANTICIPATED SAMPLE COLLECTION POINTS

Area	Number of Samples	Sample Location Details
Known MEC Area, identified in the PA and shown in Figure 4-2.	8	Four samples will be collected around the perimeter of the area, and four samples will be collected from random locations within the area.
Two additional larger *Known MEC Areas*, to be identified during the SI visual surface survey	8	From each newly identified *Known MEC Area*, a total of four samples will be collected: two randomly located samples along the perimeter and two randomly located samples from the interior.
Three additional smaller *Known MEC Areas*, to be identified during the SI visual surface survey	6	From each newly identified *Known MEC Area*, a total of six samples will be collected: two randomly located samples from the interior and/or around the perimeter.
Two erosion / redeposition locations	2	From each identified erosion/re-deposition area, one randomly located sample will be collected.
Two background / reference locations	2	From each identified background locations, one randomly located sample will be collected.
Subtotal – Site Samples	26	
Subtotal – QA/QC Samples	3	Includes three field duplicates
TOTAL	29	

Notes:

MEC – munitions and explosives of concern
PA – Preliminary Assessment
QA/QC – quality assurance/quality control
SI – Site Inspection

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TABLE 5-1

SPECIAL-STATUS SPECIES ACTIVITY PERIODS[1]

Scientific Name	Common Name	Status			January	February	March	April	May	June	July	August	September	October	November	December
		Federal	State	CNPS[2]												
Plants																
Brodiaea filifolia	Thread-leaved Brodiaea	T	E	1B.1					X	X						
Insects																
Euphydryas editha quino	Quino checkerspot butterfly	E	–			X	X	X	X							
Reptiles/Amphibians																
Bufo Californicus	Arroyo toad	E	SC				X	X	X	X	X					
Birds																
Accipiter cooperii	Cooper's Hawk	–	SC				X	X	X	X	X					
Aimophila ruficeps canescens	Southern California Rufous-crowned Sparrow	–	SC				X	X	X	X	X	X	X			
Ammodramus savannarum	Grasshopper Sparrow	–					X	X	X	X	X	X				
Aquila chrysaetos	Golden Eagle	–	SC, FP				X	X	X	X	X	X	X			
Polioptila c. californica	California Gnatcatcher	T	SC			X	X	X	X	X	X	X				
Vireo bellii pusillus	Least Bell's Vireo	E	E					X	X	X	X	X				
Mammals																
Dipodomys stephensi[3]	Stephen's Kangaroo Rat	E	T		X	X	X	X	X	X	X	X	X	X	X	X

TABLE 5-1

SPECIAL-STATUS SPECIES ACTIVITY PERIODS[1]

Notes:

[1] The activity periods are defined as periods of blooming for plants, periods of flight and breeding for insects, and periods of breeding for reptiles/amphibians, birds, and mammals.
[2] CNPS applies to plants only.
[3] Stephen's Kangaroo Rat breeds primarily in April through July. However, breeding has been observed throughout the year.

Status Abbreviations:

Federal
- E – listed as endangered under the federal Endangered Species Act (ESA)
- T – listed as threatened under the federal ESA

State
- E – listed as endangered under the California ESA
- T – listed as threatened under the California ESA
- FP – fully protected under the California Fish and Game Code
- CNPS – California Native Plant Society
- 1B.1 – rare, threatened, or endangered in California and elsewhere, seriously endangered in California

TABLE 6-1

DEFINABLE FEATURES OF WORK

ACTIVITY	PREPARATORY	DONE	INITIAL	DONE	FOLLOW-UP	DONE
Surface Sweep	• Verify that the Installation POC and ESO have been notified. • Verify that the RPM has been notified. • Verify that a qualified SHSS will be present in an active work area. • Verify that site grid system has been established. • Review exclusion zone procedure. • Review MEC screening procedure. • Verify that all site personnel, including subcontractors, have submitted health and safety documentation. • Review AHAs for this activity. • Verify that TtEC Biologist and DON Biologist have been contacted, have cleared the site for task, and are available for on-site support as needed. • Verify that all preparatory meetings have been held and documented in accordance with Work Plan. • Verify that staff fully understands biological avoidance and minimization procedures.		• Verify that a qualified SHSS is present during screening activities. • Verify that screening procedure used on site is on accordance with the Work Plan. • Verify compliance with SHSP and AHAs. • Verify that all nonessential personnel are outside the EZ boundaries. • Verify that photographs are being taken. • Verify that biological avoidance and minimization procedures are being followed.		• Verify that a qualified SHSS is present at active work area. • Verify that all nonessential personnel are outside the EZ boundaries. • Verify that screening procedure used on site is in accordance with the Work Plan. • Verify compliance with the SHSP and AHAs. • Verify that site activities were being photographed. • Verify that photographs are logged and stored. • Verify that findings are documented and logged.	

TABLE 6-1

DEFINABLE FEATURES OF WORK

ACTIVITY	PREPARATORY	DONE	INITIAL	DONE	FOLLOW-UP	DONE
Geophysical Survey	• Verify that the Installation POC and ESO have been notified. • Verify that the RPM has been notified. • Verify that a qualified SHSS will be present in an active work area. • Verify that all personnel have submitted proper H&S forms and completed H&S training. • Review subsurface utility plans, if available. • Verify that the boundaries of the areas are clearly marked. • Verify that electrical lines are de-energized, if necessary. • Review AHAs for this activity. • Verify that TtEC Biologist and DON Biologist have been contacted, have cleared the site for task, and are available for on-site support as needed. • Verify that staff fully understands biological avoidance and minimization procedures.		• Verify that a qualified SHSS is present during survey. • Verify survey location. • Verify that geophysical survey procedure is in accordance with Work Plan. • Verify that photographs are being taken. • Verify that biological avoidance and minimization procedures are being followed.		• Verify that a qualified SHSS is present in the active work area. • Verify that geophysical survey procedure is in accordance with Work Plan. • Verify that findings are documented and logged. • Verify that data is properly stored and backed up. • Verify that photographs are logged and stored.	
Sampling	• Verify that the Installation POC and ESO have been notified. • Verify that the RPM has been notified. • Verify that a qualified SHSS will be present in the active work area. • Verify that the NAVFAC SW Quality Assurance Officer has signed the SAP. • Review the SAP. • Review the geophysical results.		• Verify that a qualified SHSS is present in an active work area. • Verify sample locations and depths. • Inspect sampling procedure. • Verify equipment decontamination procedure. • Inspect sample logbook and chains of-custody.		• Verify that a qualified SHSS was present in an active work area. • Inspect the sampling procedure. • Verify that sample collection and analysis program is implemented as described in the SAP.	

TABLE 6-1

DEFINABLE FEATURES OF WORK

ACTIVITY	PREPARATORY	DONE	INITIAL	DONE	FOLLOW-UP	DONE
	• Review sampling handling and shipping procedure. • Review documentation procedure. • Review sampling equipment decontamination procedure. • Verify that sampling equipment and sample containers are available on site. • Verify that PPE is available and meets the requirements of the SHSP. • Review the AHAs. • Verify that EXPRAY Test Kits are available and procedures for use are reviewed and understood. • Verify that TtEC Biologist and DON Biologist have been contacted, have cleared the site for task, and are available for on-site support as needed. • Verify that staff fully understands biological avoidance and minimization procedures. • Verify that sampling locations have been identified and procedures for selected TBD sampling locations are understood. • Verify that GPS equipment is in place and functioning.		• Verify that proper sample containers are used as described in the SAP. • Check field documentation. • Check for compliance with the SHSP and AHAs. • Verify that photographs are being taken. • Verify that biological avoidance and minimization procedures are being followed. • Verify that EXPRAY Test Kit use is being evaluated by UXO technicians on an as-needed basis. • Verify that GPS equipment is being used and information is being properly logged. • Verify that sampling locations are in accordance with the plans.		• Verify collection of QC samples. • Check that the information listed on the sample containers is consistent with field logbook and chains of custody. • Inspect sample packaging for shipping. • Verify that chain-of-custody forms have been faxed to the laboratory. • Verify shipment of samples with Chemist. • Verify that photographs are logged and stored. • Verify that logbooks are being properly used to document all sampling activities and data. • Verify that results of EXPRAY Test Kits (if used) are being recorded and logged.	

TABLE 6-1

DEFINABLE FEATURES OF WORK

ACTIVITY	PREPARATORY	DONE	INITIAL	DONE	FOLLOW-UP	DONE
Fence Installation	• Verify that the Installation POC and ESO have been notified. • Verify that RPM has been notified. • Verify that a qualified SHSS will be present in an active work area. • Verify that fence boundaries have been marked out. • Verify that heavy equipment is inspected, if necessary. • Verify that the installation area has been cleared via geophysical survey. • Verify that UXO Technician is on site to support fence installation. • Verify that subcontractors submitted proper H&S forms and have received H&S training. • Review the AHAs. • Verify that TtEC Biologist and DON Biologist have been contacted, have cleared the site for task, and are available for on-site support as needed. • Verify that the approach for fence installation and type of fence is in compliance with the requirements of the Work Plan.		• Verify that the fence post locations were cleared by UXO technicians. • Verify that a qualified SHSS is present in an active work area. • Verify the fence boundaries and fence post locations. • Verify that heavy equipment is inspected, if necessary. • Verify that photographs are being taken. • Verify that biological avoidance and minimization procedures are being followed.		• Verify that a qualified SHSS was present in an active work area. • Verify the location of the fence line. • Verify that fence height is 6 feet high. • Verify that double gate is installed at the designated location. • Verify that signs are posted. • Verify that photographs are logged and stored.	

TABLE 6-1

DEFINABLE FEATURES OF WORK

ACTIVITY	PREPARATORY	DONE	INITIAL	DONE	FOLLOW-UP	DONE
Vegetation Clearing	• Verify that the Detachment Fallbrook POC and ESO have been notified. • Verify that the RPM has been notified. • Verify that a qualified SHSS will be present in an active work area. • Review exclusion zone procedure. • Review UXO anomaly avoidance procedure. • Verify that all site personnel, including subcontractors, have submitted health and safety documentation. • Review the Work Plan and AHAs. • Verify that vegetation clearance is not being performed during bird nesting season. • Verify that TtEC Biologist is on site during mowing activity. • Verify that DON Biologist has been contacted, has cleared the site for task, and is available for on-site support per EPP. • Verify that staff fully understands biological avoidance and minimization procedures.		• Verify that a qualified SHSS is present in an active work area. • Verify that UXO personnel is ahead of the mowing equipment. • Verify that screening procedure used on site is in accordance with the Work Plan. • Verify compliance with SHSP and AHAs. • Verify that site activities are being photographed. • Verify that biological avoidance and minimization procedures are being followed.		• Verify that a qualified SHSS was present in an active work area. • Verify that TtEC Biologist was on site during mowing activities. • Continue to inspect ongoing work. • Verify that photographs are logged and stored.	

Notes:

AHA – Activity Hazard Analysis
DON – Department of the Navy
EPP – Environmental Protection Plan
ESO – Explosive Safety Officer
EZ – exclusion zone
GPS – geographic positioning system
H&S – health and safety
MEC – munitions and explosives of concern
NAVFAC SW – Naval Facilities Engineering Command, Southwest
POC – Point of Contact
PPE – personal protective equipment
QC – quality control
RPM – Remedial Project Manager
SAP – Sampling and Analysis Plan
SHSP – Site-Specific Health and Safety Plan
SHSS – Site Health and Safety Specialist
TBD – to be determined
TtEC – Tetra Tech EC, Inc.
UXO – unexploded ordnance

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FIGURES

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LEGEND

- 76 — STATE HIGHWAY
- 15 — INTERSTATE HIGHWAY
- FALLBROOK INSTALLATION BOUNDARY
- WATER

5 0 5 10 Miles

Scale: 1" = 10 Miles

N

BASE REALIGNMENT AND CLOSURE
PROGRAM MANAGEMENT OFFICE WEST
SAN DIEGO, CA

SITE INSPECTION WORK PLAN

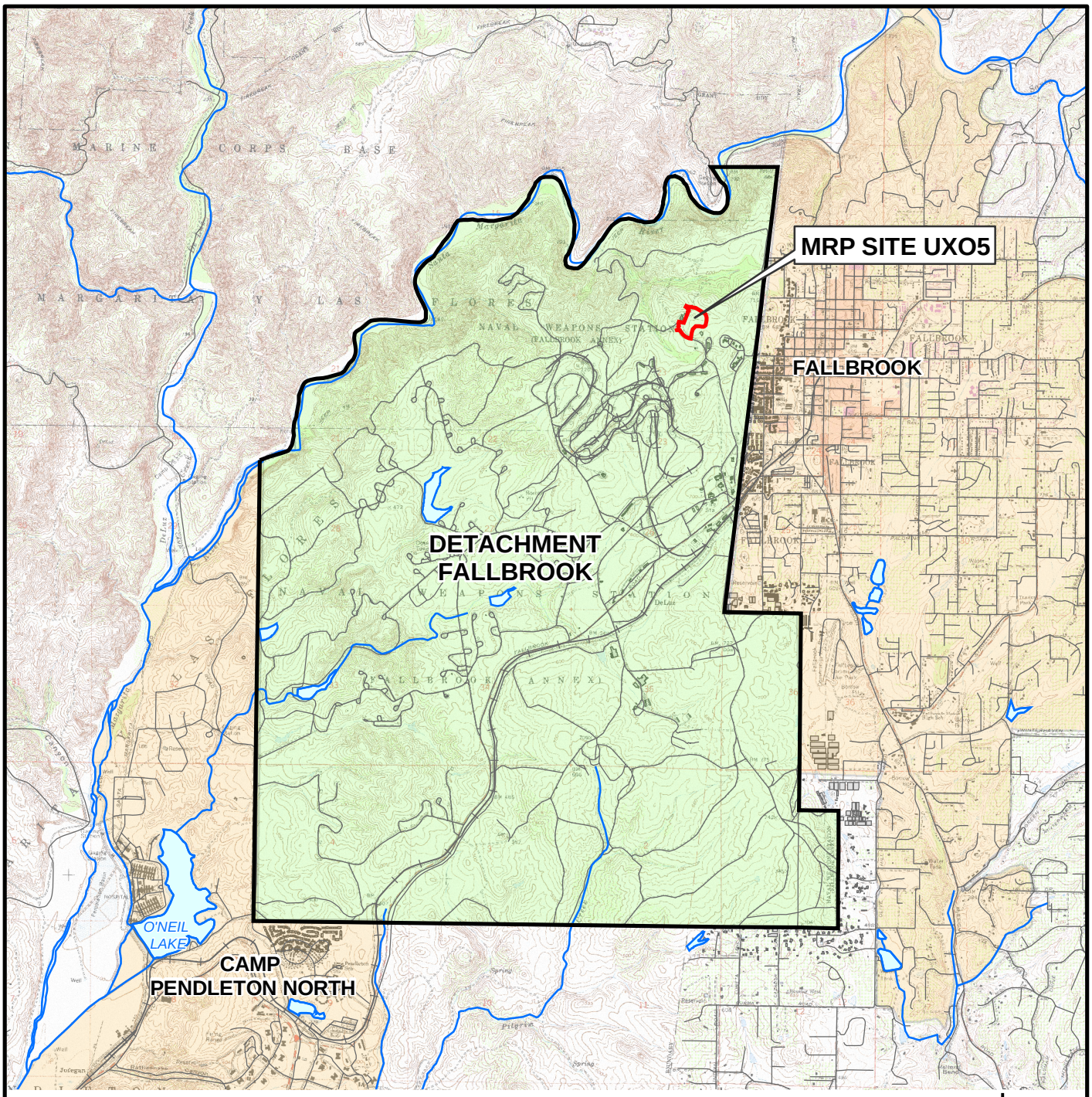
FIGURE 1-1

REGIONAL LOCATION MAP

NAVWPNSTA SEAL BEACH
DETACHMENT FALLBROOK, CALIFORNIA

REVISION: 0
AUTHOR: GFG
FILE NUMBER: 070010R1276.mxd

TETRA TECH EC, INC.



LEGEND

- ROAD
- STREAM
- RAILROAD
- MRP SITE UXO5
- FALLBROOK INSTALLMENT BOUNDARY
- BUILDING
- LAKE
- URBAN AREA

NOTES:

MRP - MUNITIONS RESPONSE PROGRAM

UXO - UNEXPLODED ORDNANCE

2,500 0 2,500 5,000 Feet

Scale: 1" = 5000'

N

BASE REALIGNMENT AND CLOSURE
PROGRAM MANAGEMENT OFFICE WEST
SAN DIEGO, CA

SITE INSPECTION WORK PLAN

FIGURE 1-2

DETACHMENT FALLBROOK LOCATION MAP

NAVWPNSTA SEAL BEACH
DETACHMENT FALLBROOK, CALIFORNIA

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LEGEND

- ROAD/PAVED SURFACE
- STREAMS
- 725 TOPOGRAPHIC CONTOURS (FT ABOVE MSL)
- BUILDING
- MRP SITE UXO5

NOTES:

FT - FEET

MRP - MUNITIONS RESPONSE PROGRAM

MSL - MEAN SEA LEVEL

NAVWPNSTA - NAVAL WEAPONS STATION

UXO - UNEXPLODED ORDNANCE

100 0 100 200 Feet

Scale: 1" = 200'

N

NAVAL FACILITIES ENGINEERING
COMMAND, SOUTHWEST
SAN DIEGO, CA

SITE INSPECTION WORK PLAN

FIGURE 2-1

MRP SITE UXO5 LOCATION MAP

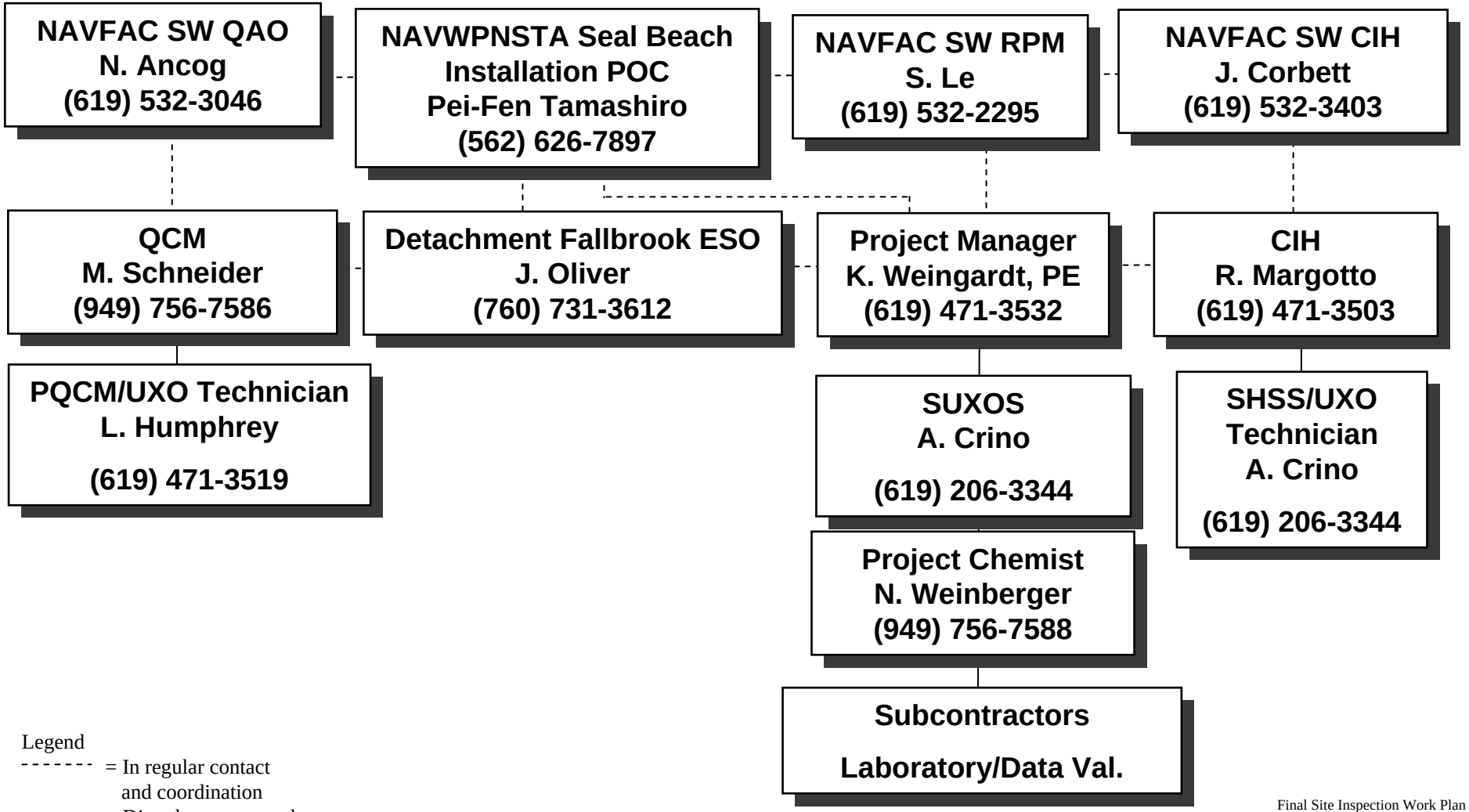
NAVWPNSTA SEAL BEACH
DETACHMENT FALLBROOK, CALIFORNIA

REVISION: 0
AUTHOR: GFG
FILE NUMBER: 070010L1278.mxd

TETRA TECH EC, INC.

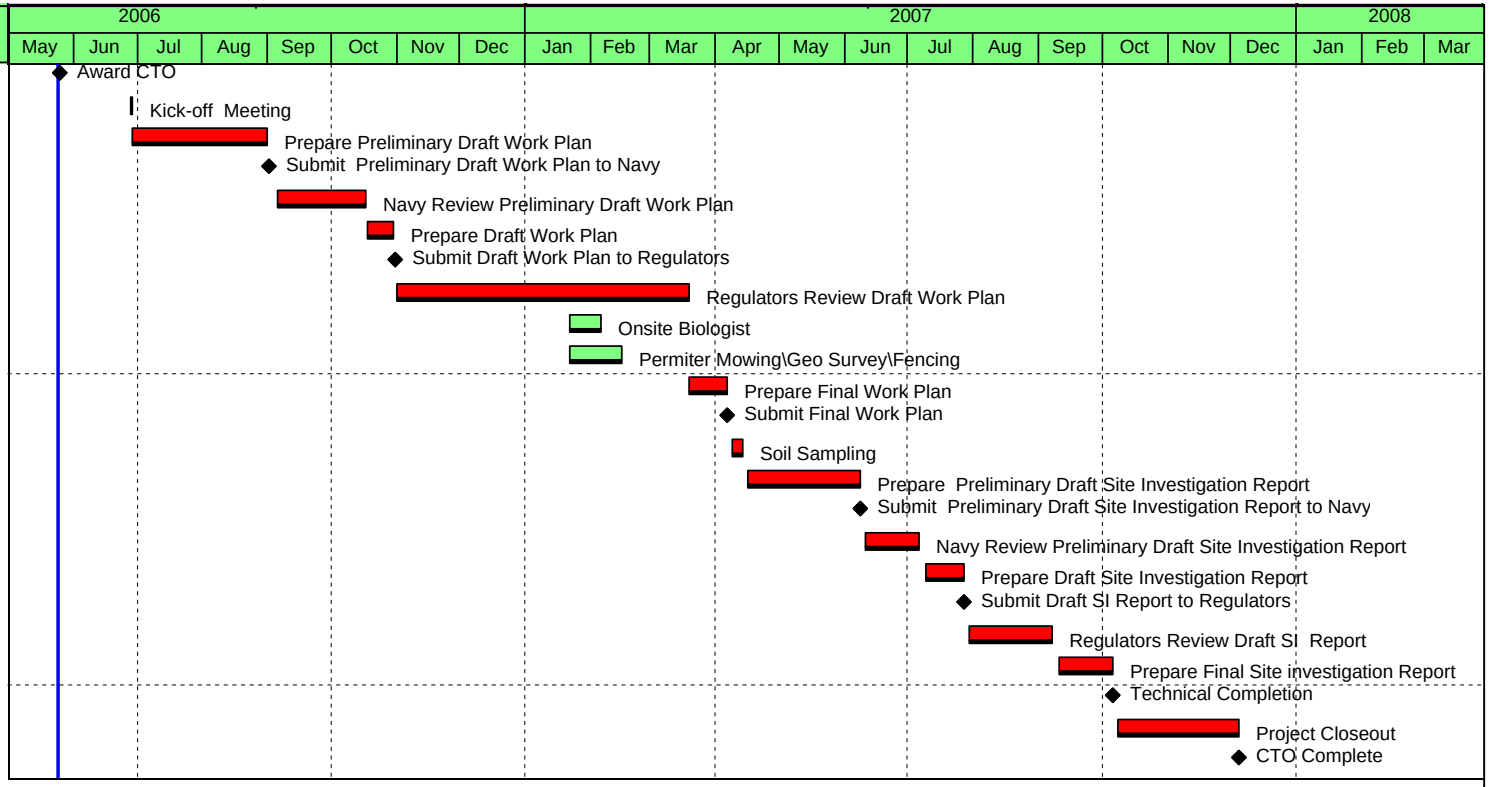
Figure 3-1

Project Organization Chart



Legend
- - - - - - - = In regular contact and coordination
——— = Directly reports to above

Original Duration	Start	Finish	
0	25-May-06		Award CTO
1	28-Jun-06	28-Jun-06	Kick-off Meeting
45	29-Jun-06	31-Aug-06	Prepare Preliminary Draft Work Plan
0		01-Sep-06	Submit Preliminary Draft Work Plan to Navy
31	05-Sep-06	17-Oct-06	Navy Review Preliminary Draft Work Plan
9	18-Oct-06	30-Oct-06	Prepare Draft Work Plan
0		31-Oct-06	Submit Draft Work Plan to Regulators
95	01-Nov-06	19-Mar-07	Regulators Review Draft Work Plan
11	22-Jan-07	05-Feb-07	Onsite Biologist
19	22-Jan-07	15-Feb-07	Permiter Mowing\Geo Survey\Fencing
15	19-Mar-07	06-Apr-07	Prepare Final Work Plan
0		06-Apr-07	Submit Final Work Plan
5	09-Apr-07	13-Apr-07	Soil Sampling
39	16-Apr-07	08-Jun-07	Prepare Preliminary Draft Site Investigation Report
0		08-Jun-07	Submit Preliminary Draft Site Investigation Report to Navy
19	11-Jun-07	06-Jul-07	Navy Review Preliminary Draft Site Investigation Report
15	09-Jul-07	27-Jul-07	Prepare Draft Site Investigation Report
0		27-Jul-07	Submit Draft SI Report to Regulators
29	30-Jul-07	07-Sep-07	Regulators Review Draft SI Report
20	10-Sep-07	05-Oct-07	Prepare Final Site investigation Report
0		05-Oct-07*	Technical Completion
40	08-Oct-07	04-Dec-07	Project Closeout
0		04-Dec-07*	CTO Complete



SWDIV DIV RAC IV - CTO 014

Figure 3-2 Project Schedule

MPR Site UXO5 - Site Inspection - NAVWPNSTA Seal Beach Detachment Fallbrook, CA

TETRA TECH EC, INC

LEGEND

- ROAD/PAVED SURFACE
- STREAMS
- 725 TOPOGRAPHIC CONTOURS (FT ABOVE MSL)
- BUILDING
- BARRICADE
- 50 FOOT EXCLUSION ZONE
- MRP SITE UXO5

NOTES:

FT - FEET

MRP - MUNITIONS RESPONSE PROGRAM

MSL - MEAN SEA LEVEL

NAVWPNSTA - NAVAL WEAPONS STATION

UXO - UNEXPLODED ORDNANCE

100 0 100 200 Feet

Scale: 1" = 200'

N

NAVAL FACILITIES ENGINEERING
COMMAND, SOUTHWEST
SAN DIEGO, CA

SITE INSPECTION WORK PLAN

FIGURE 4-1

MRP SITE UXO5 EXCLUSION ZONE

NAVWPNSTA SEAL BEACH
DETACHMENT FALLBROOK, CALIFORNIA

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AUTHOR: GFG
FILE NUMBER: 070010L1279.mxd

TETRA TECH EC, INC.

LEGEND

- MEC SIGHTING
- ROAD/PAVED SURFACE
- STREAMS
- BUILDING
- SUSPECT MEC PRESENCE
- KNOWN MEC PRESENCE
- MRP SITE UXO5

NOTES:

MEC - MUNITIONS AND EXPLOSIVES OF CONCERN

MRP - MUNITIONS RESPONSE PROGRAM

NAVWPNSTA - NAVAL WEAPONS STATION

UXO - UNEXPLODED ORDNANCE

MEC PRESENCE WAS DETERMINED IN PRELIMINARY ASSESSMENT REPORT (MALCOLM PIRNIE INC., 2005) THROUGH REVIEW OF HISTORICAL DOCUMENTATION, INTERVIEWS, AND VISUAL SURVEY.

100 0 100 200 Feet

Scale: 1" = 200'

N

NAVAL FACILITIES ENGINEERING
COMMAND, SOUTHWEST
SAN DIEGO, CA

SITE INSPECTION WORK PLAN

FIGURE 4-2

MRP SITE UXO5 MPPEH CHARACTERIZATION

NAVWPNSTA SEAL BEACH
DETACHMENT FALLBROOK, CALIFORNIA

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AUTHOR: GFG
FILE NUMBER: 070010L1280.mxd

TETRA TECH EC, INC.