Final
Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study For Ranges 43-48, Range 30A, Site OE-16 Former Fort Ord, California

Prepared for

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Contract No. DACA05-96-D-0007

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ACRONYM LIST

AAR	After Action Report
APC	Armored Personnel Carrier
AR	Army Regulation
ARAR	Applicable or Relevant and Appropriate Requirements
ASR	Archives Search Report
ASTM	American Society for Testing and Materials
BIP	Blow-in-Place
BLM	Bureau of Land Management
BO	Biological and Conference Opinion
BRAC	Base Realignment and Closure
Cal-EPA	California Environmental Protection Agency
CDFG	California Department of Fish and Game
CEHND	U.S. Army Engineering and Support Center, Huntsville
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMC	Central Maritime Chaparral
CMS	CMS Environmental
CNCC	California Natural Coordinating Council
CX	Center of Expertise
DDESB	Department of Defense Explosives Safety Board
DoD	Department of Defense
DQO	Data Quality Objective
DTSC	Department of Toxic Substances Control
EE/CA	Engineering Evaluation/Cost Analysis
EPA	Environmental Protection Agency

ESA	Endangered Species Act
GPS	Global Positioning System
Harding ESE	Harding ESE, Inc., formerly Harding Lawson Associates
HCRS	Heritage Conservation and Recreation Service
HE	High Explosive
HEAT	High Explosive Antitank
HEDP	High Explosive Dual Purpose
HFAI	Human Factors Applications, Inc.
HMP	Habitat Management Plan
HTW	Hazardous and Toxic Waste
HLA	Harding Lawson Associates, now known as Harding ESE
IA	Interim Action
IC	Institutional Control
LAW	Light Antitank Weapon
LDSP	Land Disposal Site Plan
LTRM	Long-Term Risk Management
MCX	Mandatory Center of Expertise
MRA	Multi-Range Area
MSL	Mean Sea Level
NCP	National Contingency Plan
NPV	Net Present Value
NTCRA	Non-Time-Critical Removal Action
O&M	Operations and Maintenance
OE	Ordnance and Explosives
ODDS	Ordnance Detection and Discrimination Study
OMC	Ord Military Community
POM	Presidio of Monterey Annex

QA/QC	Quality Assurance/Quality Control
RAC	Risk Assessment Code
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RR	Recoilless Rifle
SAP	Sampling and Analysis Plan
SDWA	Safe Drinking Water Act
SOP	Standard Operating Procedure
SOW	Scope of Work
TCRA	Time-Critical Removal Action
TP	Target Practice
TRADOC	Training and Doctrine Command
USACE	U.S. Army Corps of Engineers
USAESCH	U.S. Army Engineering and Support Center, Huntsville (OE Center of Expertise)
USFWS	U.S. Fish and Wildlife Service
UXB	UXB International
UXO	Unexploded Ordnance
WP	White Phosphorous
WWII	World War II

GLOSSARY

Closed Range: A military range that has been taken out of service and either has been put to new uses that are incompatible with range activities or is not considered by the military to be a potential range area. A closed range is still under the control of a Department of Defense (DoD) component. Source: (3).

Engineering Control (EC): A variety of engineered remedies to contain and/or reduce contamination, and/or physical barriers intended to limit access to property. Some examples of ECs include fences, signs, guards, landfill caps, soil covers, provision of potable water, slurry walls, sheet pile (vertical caps), pumping and treatment of groundwater, monitoring wells, and vapor extraction systems. Source: (1).

Expended: The state of an Ordnance and Explosives (OE) item in which the main charge has been expended leaving the inert carrier. Source: (2).

Feasibility Study (FS): An evaluation of potential remedial technologies and treatment options that can be used to clean up a site. Source: (2).

Institutional Control (IC): A legal or institutional mechanism that limits access to or use of property, or warns of a hazard. An IC can be imposed by the property owner, such as use restrictions contained in a deed, or by a government, such as a zoning restriction. Source: (1).

Land Use Controls: A combination of engineering and institutional controls intended to protect human health and the environment. Source: (1).

Magnetometer: An instrument for measuring magnetic field strength that is used in the field to detect buried ferromagnetic objects. Ground magnetometers sometimes measure the vertical component of the magnetic field, sometimes a horizontal component, sometimes the total field. Source: (2).

Mortar: Mortars range from approximately 1 inch to 11 inches in diameter and can be filled with explosives, toxic chemicals, white phosphorus or illumination flares. Mortars generally have thinner metal casing than projectiles but use the same types of fuzing and stabilization. Source: (1).

Multi-Range Area (MRA): The MRA consists of approximately 8,000 acres in the southwestern portion of former Fort Ord, bordered by Eucalyptus Road to the north, Barloy Canyon Road to the east, South Boundary Road to the south, and North-South Road to the west. Source: (2).

Non-OE Related Scrap: Non-munitions material found at ordnance sites. This can be banding, wire, trash, auto parts, shipping boxes, or any kind of material that has been abandoned or discarded at an OE site that was

never a component of military munitions. (Ferrous rocks that activate geophysical instruments during investigations, which are removed from the site, are classified as "other"). Source: (2).

Non-Transportable OE Item: For the purposes of addressing OE at Fort Ord, non-transportable OE items include those that are non-movable (unsafe to move under any circumstances), and moveable (may be moved by hand only within close proximity to their original position for consolidation and/or to ensure detonations are performed under the safest possible conditions).

When making a determination as to whether or not an OE item is safe to move from its encountered orientation or location, item-specific variables must be considered that may include but are not limited to: characteristics of the site, type of ordnance, position/location of the item, type of fuzing, and condition of the item and the fuze. Documents such as EP 385-1-92a, Basic Safety Concepts and Considerations for Ordnance and Explosives Operations; TM 60 series and applicable Ordnance Data Sheets are reviewed to assist in making a determination. If there is doubt as to the identity of the item, its condition, or if it can be handled, the onsite USACE UXO Safety Specialist will make the determination. Source: (2).

OE Sampling: Performing OE searches within a site to determine the presence of OE. Source: (2).

OE Scrap: OE scrap includes those items which are fragments of functioned ordnance, as designed or intentionally destroyed, and which contain no explosive or other items of a dangerous nature. OE scrap is inert and does not pose a safety risk. Source: (1).

Ordnance and Explosives (OE): Anything related to munitions designed to cause damage to personnel or material through explosive force or incendiary action including bombs, warheads, missiles, projectiles, rockets, antipersonnel and antitank mines, demolition charges, pyrotechnics, grenades, torpedoes and depth charges, high explosives and propellants, and all similar and related items or components explosive in nature or otherwise designed to cause damage to personnel or material. Source: (2).

Operating Grids: Typically, 100-foot by 100-foot parcels of land as determined by survey and recorded by GPS, marked at each corner with wooden stakes. Sites are divided into operating grids prior to the commencement of work by brush removal or OE sweep teams. A single grid may be occupied by only one team at any time, and the grid system facilitates the maintenance of safe distances between teams. They are identified sequentially using an alpha-numeric system (e.g., E-5). Source: (2).

Projectile: An object projected by an applied force and continuing in motion by its own inertia, as a bullet, bomb, shell, or grenade. Also applied to rockets and to guided missiles. Source: (4).

Remedial Investigation (RI): Exploratory inspection conducted at a site to delineate the nature and extent of chemical, and in this case OE, present at the site. Source: (2).

Removal Depth: The depth below ground surface to which all ordnance and other detected items are removed. Source: (2).

SiteStats/GridStats: Programs developed by QuantiTech for the Huntsville Corps of Engineers to predict the density of ordnance on sites with spatially random dispersal of ordnance. Source: (2).

Surface Removal: Removal of OE from the ground surface by UXO teams using visual identification aided by magnetometers. Source: (2).

Transferred Range: A military range that is no longer under military control and has been leased, transferred, or returned to another entity, including Federal entities. This includes a military range that is no longer under military control but was used under the terms of a withdrawal, executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the Federal land manager. Source: (3).

Transferring Range: A military range that is proposed to be leased, transferred, or returned from the Department of Defense to another entity, including Federal entities. This includes a military range that is used under the terms of a withdrawal, executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the Federal land manager. An active range will not be considered a "transferring range" until the transfer is imminent. Source: (3).

Transportable OE Item: For the purposes of addressing ordnance and explosives (OE) at Fort Ord, transportable OE items are those that, as determined by the OE contractor (with concurrence of the USACE UXO Safety Specialist), may be transported by vehicle from their original position to an area outside the vicinity for the purposes of storage, consolidation with other items for demolition, or for offsite destruction.

When making a determination as to whether or not an OE item is safe to move from its encountered orientation or location, item-specific variables must be considered that may include but are not limited to: characteristics of the site, type of ordnance, position/location of the item, type of fuzing, and condition of the item and the fuze. Documents such as EP 385-1-92a, Basic Safety Concepts and Considerations for Ordnance and Explosives Operations; TM 60 series and applicable Ordnance Data Sheets are

reviewed to assist in making a determination. If there is doubt as to the identity of the item, its condition, or if it can be handled, the onsite USACE UXO Safety Specialist will make the determination. Source: (2).

Unexploded Ordnance (UXO): A military munition that contains an explosive or pyrotechnic charge and has been primed, fuzed, armed, or otherwise prepared for action, and that has been fired, placed, dropped, launched, projected, and remains unexploded by design or malfunction. These can be, but are not limited to, high-explosive warheads, rocket motors, practice munitions with spotting charges, torpedoes, artillery and mortar ammunition, grenades, incendiary munitions, electroexplosive devices, and propellant-actuated devices. Fuzes with live explosive boosters or dets are classified as UXO. Some kick-outs from open detonation or open burn operations may be UXO. All UXO are potentially dangerous and cannot be released for public use without being rendered safe (neutralized, vented, detonated, decontaminated, or demilitarized). Source: (2).

Sources:

(1) Compendium of Department of Defense Acronyms, Terms, and Definitions: The Interstate Technology and Regulatory Cooperation (ITRC) Work Group (Unexploded Ordnance Work Team), December, 2000.

(2) Non-standard definition developed to describe Fort Ord-specific items, conditions, procedures, principles, etc. as they apply to issues related to the OE cleanup.

(3) Department of Defense (DoD), 1997. 32 CFR Part 178; Closed, Transferred, and Transferring Ranges Containing Military Munitions; Proposed Rule. September

(4) "Unexploded Ordnance (UXO): An Overview" October, 1996. DENIX.

1.0 INTRODUCTION

The former Fort Ord is located near Monterey Bay in northwestern Monterey County, California (Plate 1). Since 1917, portions of the former Fort Ord were used by infantry units for maneuvers, target ranges, and other purposes. Ordnance and explosives (OE) were fired into, fired upon, or used on the facility in the form of artillery and mortar projectiles, rockets and guided missiles, rifle and hand grenades, practice land mines, pyrotechnics, bombs, and demolition materials. A wide variety of conventional unexploded ordnance (UXO) items have been located at sites throughout the former Fort Ord, including pyrotechnics and explosives.

On behalf of the U.S. Army Corps of Engineers (USACE)—Sacramento District, Harding ESE, Inc. (Harding ESE; formerly known as Harding Lawson Associates [HLA]) has prepared this Interim Action Remedial Investigation/Feasibility Study (IA RI/FS) to address OE in specific areas of the former Fort Ord, California (Fort Ord) (Plate 1) in order to: (1) take quick action to protect human health and the environment from an imminent threat in the short term while a final remedial solution is being developed and (2) institute temporary measures to stabilize the site and prevent further migration or degradation. The Interim Action sites (IA sites) addressed in this report include Ranges 43-48, Range 30A, and Site OE-16. Their locations relative to neighboring communities are shown on Plate 2. This report has been prepared in accordance with USACE Scope of Work (SOW) dated March 23, 1999, Delivery Order 0056, Contract DACA05-96-D-0007.

1.1 Description of the OE RI/FS Program

The OE RI/FS program is described in detail in the Final OE RI/FS Work Plan (*Army, 2000*). Elements of the OE RI/FS program include this Interim Action RI/FS to address immediate risks (as described in Section 1.2, Rationale for Conducting an Interim Action for OE), a literature review, preparation of a Sampling and Analysis Plan (SAP) for additional OE characterization activities, evaluation of previous OE work, performance of an Ordnance Detection and Discrimination Study (ODDS), identification of Applicable or Relevant and Appropriate Requirements (ARARs), development of long-term risk management measures, evaluation of risks, a community relations plan, and a health and safety plan.

The information gathered and evaluated during the literature review and the OE RI/FS will be used to categorize all other areas of the former Fort Ord according to actions that have been taken or that are identified as necessary to mitigate OE hazards. The information that will be evaluated to form decisions will include, but not be limited to, the knowledge of the site, the quality of the available information, the work completed, and the intended future land uses. Areas will be managed during the OE RI/FS process within one of four proposed "tracks" (Tracks 0 through 3) as described in the OE RI/FS Work Plan (*Harding ESE, 2000a*).

1.2 Rationale for Conducting an Interim Action for OE

During the preparation of an RI/FS, the lead agency may determine that an interim remedial action is appropriate. An interim action is limited in scope and only addresses areas/media that will be followed by an RI/FS and Record of Decision (ROD). Reasons for taking an interim action could include the need to:

- Take quick action to protect human health and the environment from an imminent threat in the short term, while a final remedial solution is being developed; or

- Institute temporary measures to stabilize the site and/or prevent further migration or degradation.

The U.S. Army (Army), as the lead agency, has determined that an interim action is appropriate to protect human health from the imminent threat posed by UXO at Ranges 43–48, Range 30A and Site OE-16.

1.3 Report Organization

This IA RI/FS was prepared in accordance with the U.S. Environmental Protection Agency (EPA) document *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (Comprehensive Environmental Response, Compensation, and Liability Act) (*EPA, 1988*). This IA RI/FS is organized as follows:

Section 1 – Introduction. This section provides background information on the IA RI/FS and OE RI/FS processes.

Section 2 – Purpose and Objectives. This section defines an Interim Action and describes the purpose and objectives of the IA RI/FS.

Section 3 – Background. This section presents the Fort Ord OE-related history and describes the physical setting.

Section 4 – Interim Action Remedial Investigation. This section describes the IA sites and presents the Interim Action Remedial Investigation, which summarizes the site information, vegetation status, OE-related information, and conceptual site models for each of the three IA sites.

Section 5 – Interim Remedial Action Objectives and Site Selection of Interim Action Sites. This section presents the Interim Action objectives and the site selection criteria and rationale for selection of the IA sites.

Section 6 – Interim Action Feasibility Study. This section presents the Interim Action Feasibility Study, which includes the development, screening, evaluation, and comparison of Interim Action Alternatives, as well as an analysis of Applicable or Relevant and Appropriate Requirements (ARARs).

Section 7 – Selection of Preliminarily Identified Preferred Interim Action Alternatives. This section presents the selection of the Preliminarily Identified Preferred Interim Action Alternatives for each of the IA sites based on the evaluation and comparison of Interim Action Alternatives and analysis of ARARs. The Preferred Interim Action Alternatives for each of the IA sites will be presented in the Proposed Plan and selected and documented in the Record of Decision (ROD).

Section 8 – Approval Process. This section describes the approval process for the Interim Actions and presents an Implementation Process Flow Chart for Interim Action.

Section 9 – References. This section provides a list of references to pertinent documents cited in the report.

2.0 PURPOSE AND OBJECTIVES

This section defines an Interim Action and describes the purpose and objectives of the IA RI/FS.

2.1 Definition of an Interim Action

An Interim Action is a remedial action that can be implemented quickly and that, although not necessarily intended as a final remedial measure at a site, substantially reduces potential immediate, imminent, and/or substantial risks to human health or the environment. This document evaluates remedial actions to be taken at each of the IA sites.

Remedial activities conducted at the IA sites will be further evaluated under the basewide OE RI/FS to determine the adequacy of actions taken, their consistency with the long-term remedy, and the need for further action, if any. The OE RI/FS will evaluate:

- The effectiveness of the geophysical detection instruments used
- Conceptual site models vs. actual field conditions
- Completeness of IA remedial actions relative to data quality objectives for the OE RI/FS program
- Assessment of any potential residual OE risks
- The need for long-term risk management measures to address any potential residual OE risks.

2.2 Purpose

The RI/FS process as outlined in the EPA guidance (*EPA, 1988*) represents the methodology that the Superfund program has established for characterizing the nature and extent of risks posed by contaminated sites and for evaluating potential remedial options. The purpose of this IA RI/FS is to describe the site conditions and the risks posed by UXO at Ranges 43–48, Range 30A and Site OE-16, and recommend the most appropriate interim action to address OE risks based on the criteria specified in the National Contingency Plan and EPA guidance. Remedial actions at the IA sites are being evaluated on an interim basis because the OE RI/FS will not be completed until 2005, and there is a need to (1) take quick action to protect human health from an imminent threat and/or (2) institute temporary measures to stabilize the IA sites in the short term, while a final remedial solution is being developed under the OE RI/FS for these sites.

2.3 Objectives

The objectives of this IA RI/FS are to:

- Demonstrate the need for remedial action to reduce the imminent threat to human health at Ranges 43–48, Range 30A and Site OE-16
- Evaluate three-tiered alternatives at each IA site for: (1) vegetation clearance, (2) OE remedial action, and (3) OE detonation
- Select a three-tiered Preliminarily Identified Preferred Alternative for each IA site.

3.0 BACKGROUND

This section provides a summary of the former Fort Ord OE related history, a description of its physical setting, and the background of the OE RI/FS.

3.1 Historical Use

Military training on the former Fort Ord began in approximately 1917 and continued until base closure in 1994. At its founding in 1917, the former Fort Ord served primarily as training and staging facility for infantry troops. From 1947 to 1974, the Installation was a basic training center. After 1974, the 7th Infantry Division occupied the Installation. The 7th Infantry Division was converted to a light division in 1983; light infantry troops operate without heavy tanks or armor. The former Fort Ord was selected in 1991 for base realignment and closure (BRAC), and the base was officially closed in September 1994.

In 1917, the U.S. Army (Army) bought a portion of the present-day Main Garrison and East Garrison, and nearby lands on the east south central side of the former Fort Ord to use as a maneuver and training ground for field artillery and cavalry troops stationed at the Presidio of Monterey. Before the Army's acquisition of the property, the area was agricultural, as is much of the surrounding land today. No permanent improvements were made until the late 1930s, when administrative buildings, barracks, mess halls, tent pads, and a sewage treatment plant were constructed.

In 1940, additional agricultural property was purchased for further development of the Main Garrison. At the same time, beachfront property was donated to the Army. Building construction in the Main Garrison began in 1940 and continued into the 1960s, starting in the northwest corner of the base and expanding southward and eastward. During the 1940s and 1950s, the Army constructed and maintained a small airfield within the Main Garrison in what became the South Parade Ground. In the early 1960s, when the Fritzsche Army Airfield was completed, the Main Garrison airfield was decommissioned and its facilities were redeveloped as motor pools and other facilities.

3.1.2 History of OE Use

Since 1917, portions of the Installation were used by infantry units for maneuvers, target ranges, and other purposes. OE that have been fired into, fired upon, or used on the facility include artillery and mortar projectiles, rockets and guided missiles, rifle and hand grenades, practice land mines, pyrotechnics, bombs, and demolition materials. A wide variety of conventional UXO items have been located at sites throughout the former Fort Ord, including pyrotechnics and explosives.

3.1.3 Summary of Existing OE Program

Prior to and concurrent with the preparation of the OE RI/FS, the Army had been conducting an OE cleanup that consists of implementing and documenting OE removal actions in areas with imminent OE hazards. These removal actions have not only reduced imminent OE hazards but have also provided information about the type of UXO and level of OE hazard at each of the sites for use in the OE RI/FS.

Work for the existing OE program has been conducted in accordance with the following documents:

- Time-critical removal actions have been implemented as described in the *Fort Ord Ordnance and Explosive Waste Time-Critical Removal Action Memorandum* (*Army, 1994*).

- Non-time-critical removal actions are being addressed in the *Action Memorandum, Phase 2 Engineering Evaluation/Cost*

Analysis, Ordnance and Explosives Sites, Former Fort Ord, Monterey County, California (*Army, 1999a*). The Action Memorandum, Phase 2 EE/CA identifies and describes the rationale for continuing with UXO removal actions at OE sites while the OE RI/FS is being conducted and addresses recommendations for future UXO removal actions.

- All removal actions have been implemented in accordance with the Land Disposal Site Plan (LDSP), LDSP amendments, and explosive safety submissions, which have been approved by the Department of Defense Explosives Safety Board (DDESB). These plans are required to describe the nature, extent, and types of known or suspected UXO contamination, the proposed future use of each area, and procedures for mitigating OE hazards in a manner compatible with the proposed land reuse and in accordance with Department of Defense (DoD) safety standards.

- Known or suspected OE sites have been identified and listed in the 1997 Draft Revised Archive Search Report (ASR; *USAEDH, 1997*), which is an update of previous ASRs (*USAEDH, 1993; 1994*).

- Previously identified, known, or suspected OE sites, identified at the time the ASR was issued, were listed in the Phase 1 Engineering Evaluation/Cost Analysis (Phase I EE/CA; *USAEDH, 1997*) and the Phase 2 Engineering Evaluation/Cost Analysis (Phase 2 EE/CA; *Army, 1998c*). Because past military training activities resulted in the deposition of UXO in some areas on the former Fort Ord, the Phase 1 and Phase 2 EE/CAs (*USAEDH, 1997; Army, 1998c*) were developed to describe the UXO removal and management activities for sites known or suspected to contain UXO. The Phase 1 EE/CA addressed 29 OE sites and subsites (*USAEDH, 1997*). The Phase 2 EE/CA addressed the remaining OE sites, including future sites (*Army, 1998c*). Sites for which no further removal actions were recommended in the Phase 1 EE/CA (*USAEDH, 1997*) were addressed in the *Action Memorandum 1, Phase 1 EE/CA, Twelve Ordnance and Explosives Sites* (*Army, 1998a*). The Phase 2 EE/CA established a "plug-in" evaluation process designed to address any UXO situation on the former Fort Ord (*Army, 1998c*); the Action Memorandum, Phase 2 EE/CA documents the process (*Army, 1999a*).

- The Phase 2 EE/CA process addressed additional known or suspected OE sites not evaluated in Action Memorandum 1 by developing categories for each site based on: (1) expected type of UXO present, (2) soil type, and (3) future land use of the site (*USAEDH, 1998*). Five removal alternatives were developed to address each category of site. UXO data was obtained from the Archives Search Report (ASR) prepared in December 1993, the ASR Supplement prepared in November 1994, and the Revised Draft ASR completed in 1997 (*USAEDH, 1993; 1994; 1997*). A preliminary site reconnaissance was conducted as part of the ASR to further identify/characterize potential OE sites; the results are contained in the 1997 ASR. The Phase 2 EE/CA provided a summary of the number and types of UXO and ordnance related scrap found during removal actions at OE sites on the former Fort Ord at the time the EE/CA was prepared (*Army, 1998c*). Data on UXO and ordnance related scrap identified since that time, and on an ongoing basis as removal actions are performed, will be provided in After Action Reports and in the OE RI/FS.

3.2 Physical Setting

The following sections summarize the location and general physical setting of the base, including intended land uses.

3.2.1 Location

The former Fort Ord is adjacent to Monterey Bay in northwestern Monterey County, California, approximately 80 miles south of San Francisco (Plate 1). The base consists of approximately 28,000 acres adjacent to the cities of Seaside, Sand City, Monterey, and Del Rey Oaks to the south and Marina to the north. The Southern Pacific Railroad and Highway 1 pass through the western part of the former Fort Ord, separating the beachfront portions from the rest of the base. The south and southeast of the former Fort Ord are bordered by unincorporated portions of Monterey County, and include several communities as well as the Laguna Seca Recreation Area and Toro Regional Park. Land use immediately east of the former Fort Ord is primarily agricultural.

3.2.2 General History

Beginning with its founding in 1917, Fort Ord served primarily as a training and staging facility for infantry troops. From 1947 to 1974, Fort Ord was a basic training center. After 1974, the 7th Infantry Division occupied Fort Ord. Fort Ord was selected in 1991 for decommissioning, but troop reallocation was not completed until 1993. Although Army personnel still operate the base, no active Army division is stationed at Fort Ord.

3.2.3 Land Use

The former Fort Ord consists of both developed and undeveloped land. The three principal developed areas are the East Garrison, the Fritzsche Army Airfield (FAAF), and the Main Garrison; these areas collectively comprise approximately 8,000 acres. The remaining 20,000 acres are largely undeveloped areas. Land uses in both the developed and undeveloped areas when the former Fort Ord was active are described below.

3.2.3.1 Developed Land

With up to 15,000 active duty military personnel and 5,100 civilians working onsite during its active history, the former Fort Ord's developed areas resembled a medium-sized city, with family housing, medical facilities, warehouses, office buildings, industrial complexes, and gas stations. Individual land-use categories were as follows:

- Residential areas included military housing, such as training and temporary personnel barracks, enlisted housing, and officer housing.
- Local services/commercial areas provided retail or other commercial services such as gas stations, mini-markets, and fast-food facilities.
- Military support/industrial areas included industrial operations such as motor pools, machine shops, a cannibalization yard (where serviceable parts are removed from damaged vehicles), and the FAAF.
- Mixed land-use areas combined residential, local services/commercial, and military support operations.
- Schools included the Thomas Hayes Elementary, Roger S. Fitch Middle, General George S. Patton Elementary, Marshall Park Elementary, and Gladys Stone schools. High school students attended Seaside High, outside the former Fort Ord's southwest boundary.
- Hospital facilities included the Silas B. Hayes Army Hospital, medical and dental facilities, and a helipad.
- Training areas included a central track and field, firing ranges, and obstacle courses.
- Recreational areas included a golf course and clubhouse, baseball diamonds, tennis courts, and playgrounds.

The three principal developed areas are described below:

- East Garrison: The East Garrison is on the northeast side of the base, adjacent to undeveloped training areas. Military/industrial support areas at the East Garrison included tactical vehicle storage facilities, defense recycling and disposal areas, a sewage treatment plant, and small arms ranges. The East Garrison also included recreational open space with primitive camping facilities, baseball diamonds, a skeet range, and tennis courts. Recreational open space occupied 25 of the approximately 350 acres of the East Garrison.

- Fritzsche Army Airfield (FAAF): The former FAAF is in the northern portion of the former Fort Ord, on the north side of Reservation Road and adjacent to the city limits of Marina. The primary land use was military/industrial support operations; facilities included airstrips, a motor park, aircraft fuel facilities, a sewage treatment plant, aircraft maintenance facilities, an air control tower, a fire and rescue station, and aircraft hangars.

- Main Garrison: The Southern Pacific Railroad right-of-way and Highway 1 separate the coastal zone from the former Fort Ord's Main Garrison. The Main Garrison consisted of a complex combination of the various land-use categories. Facilities included schools, a hospital, housing, commercial facilities, (including a dry cleaner and a gasoline service station), and industrial operations (including motor pools and machine shops).

3.2.3.2 Undeveloped Land

The two principal undeveloped areas are described below:

Coastal Zone: A system of sand dunes lies between Highway 1 and the shoreline. The western edge of the dunes has an abrupt drop of 40 to 70 feet, and the dunes reach an elevation of 140 feet above mean sea level on the gentler, eastern slopes. The dunes provided a buffer zone that isolated the Beach Trainfire Ranges from the shoreline to the west. Stilwell Hall (a former recreation center), numerous former target ranges, former ammunition storage facilities, and two inactive sewage treatment facilities lie east of the dunes.

Because of the presence of rare and/or endangered species and because of its visual attributes, Monterey County has designated the former Fort Ord's coastal zone an environmentally sensitive area. The California Natural Coordinating Council (CNCC) and the Heritage Conservation and Recreation Service (HCRS) have identified the dunes at the former Fort Ord as among the best coastal dunes in California because of significant features including coastal strand vegetation and the habitat of the black legless lizard (*MCPD, 1984*).

Inland Areas: Undeveloped land in the inland portions of the former Fort Ord includes the Multi-Range Area (MRA) and infantry training areas, portions of which were used for livestock grazing and recreational activities such as hunting, fishing, and camping. These undeveloped areas are primarily left in their natural state, with only minor development of facilities.

3.2.3.3 Future Land Use

The future land uses presented in this section are primarily based upon the Fort Ord Reuse Authority (FORA) March 1997 Fort Ord Base Reuse Plan (*FORA, 1997*) and the July 1995 U.S. Army Corps of Engineers (USACE) and Bureau of Land Management (BLM) Site Use Management Plan (SUMP) (*USACE, 1995*). Other sources of future land use include public benefit conveyance, negotiated sale requests, transfer documents, and the Installation-Wide Multispecies Habitat Management Plan (HMP) (*USACE, 1997*). The Reuse Plan identified approximately 20 land-use categories at Fort Ord (*FORA, 1997*) including habitat

management, open space/recreation, institutional/public facilities, commercial, industrial/business park, residential, tourism, mixed use, and others. The SUMP identified four unique future reuse designations, accounting for the entire MRA. These designations include unrestricted areas, unrestricted/BLM areas, limited-access areas, and restricted/administration areas. Anticipated future uses within each designation are described below:

- Unrestricted areas: Urban development, recreation development, and transportation
- Unrestricted/BLM areas: Construction of facilities, habitat restoration, and maintenance of access routes
- Limited-access areas: Recreation access, notification uses, and habitat restoration
- Restricted/administration areas: Habitat monitoring and habitat enhancement.

Limited-access areas include areas that are within the core of the MRA but outside of high-impact areas. These areas will be cleared of OE sufficient to support recreational uses including mountain biking, equestrian uses, and pedestrian uses (to occur on established trail systems). Existing fuelbreaks will also be cleared of OE sufficiently to allow heavy equipment to travel over fire roads for firefighting activities and annual maintenance. Limited-access areas will be transferred with land-use controls for any surface disturbance or subsurface excavation outside of established roads, trails, and fuelbreaks (*USACE, 1995*).

The HMP (*USACE, 1997*) presents the revised boundaries of the habitat reserve areas and describes special land-use controls and habitat monitoring requirements for target species within the HMP Reserve and Development Areas. The HMP confirms locations of low-intensity uses such as the HMP reserve areas; it also specifies an allowance for development within the reserve areas for public access support facilities in as much as 2 percent of the area. The HMP also confirms locations of high-intensity uses (e.g., development) outside of the MRA and reserve areas.

3.2.4 Site Features

The following section summarizes site features at the former Fort Ord.

3.2.4.1 Climate

The area's climate is characterized by warm, dry summers and cool, rainy winters. The Pacific Ocean is the principal influence on the climate at the former Fort Ord, and the source of fog and onshore winds that moderate temperature extremes. Daily ambient air temperatures typically range from 40 to 70 degrees Fahrenheit (F), but temperatures in the low 100s have occurred. Thick fog is common in the morning throughout the year. Winds are generally from the west.

The average annual rainfall of 14 inches occurs almost entirely between November and April. Because the predominant soil is permeable sand, runoff is limited and streamflow occurs only intermittently and within the very steep canyons in the eastern portion of the former Fort Ord.

3.2.4.2 Ecological Setting

The former Fort Ord is located on California's central coast, a biologically diverse and unique region. The range and combination of climatic, topographic, and soil conditions at the former Fort Ord support many biological communities. Field surveys were conducted from 1991 through 1994 to provide detailed site-specific, as well as basewide, information regarding plant communities, botanical resources, observed and expected wildlife, and biological resources of concern. Plant communities were mapped for the whole base as described in the *Draft Basewide Biological Inventory, Fort Ord, California* (*Harding ESE, 1992*).

Several of the former Fort Ord plant communities have been combined for simplification. The 12 plant communities

described at former Fort Ord sites include: coast live oak woodland (coastal and inland); central maritime chaparral; central coastal scrub; grassland; developed/landscaped and disturbed dunes; dune scrub; iceplant mats; riparian forest; wetlands (including vernal pools and freshwater marsh); and coastal strand. Central maritime chaparral is the most extensive natural community at the former Fort Ord, occupying approximately 12,500 acres in the south-central portion of the base. Oak woodlands are widespread at the former Fort Ord and occupy the next largest area, about 5,000 acres. Grasslands, located primarily in the southeastern and northern portions of the base, occupy approximately 4,500 acres. The other community types generally occupy less than 500 acres each. The remaining approximately 4,000 acres of the base are considered fully developed and not defined as ecological communities.

Special-status biological resources are those resources, including plant and wildlife taxa and native biological communities, that receive various levels of protection under local, state, or federal laws, regulations, or policies. The closure and disposal of former Fort Ord is considered a major federal action that could affect several species of concern and other rare species listed by the California Department of Fish and Game and/or the California Native Plant Society or listed as threatened or endangered under the federal Endangered Species Act (ESA). The U.S. Department of the Interior, Fish and Wildlife Service (USFWS) final Biological Opinion for the Disposal and Reuse of Fort Ord (*USFWS, 1993*) required that a habitat management plan be developed and implemented to reduce the incidental take of listed species and loss of habitat that supports these species. The HMP for former Fort Ord complies with the USFWS Biological Opinion and establishes the guidelines for the conservation and management of wildlife and plant species and habitats that largely depend on former Fort Ord land for survival (*USACE, 1997*). Of the 12 plant communities identified at the former Fort Ord, two are considered rare or declining and of highest inventory priority by the California Department of Fish and Game (*CDFG, 1997*): central maritime chaparral and valley needlegrass grassland. Special-status taxa that occur or potentially occur in the plant communities at the former Fort Ord include 22 vascular plants, 1 invertebrate, 4 reptiles, 1 amphibian, 9 birds, and 2 mammals. Table 1 contains a list of the special-status species at the IA sites.

From 1994 to the present, baseline and follow-up surveys have been conducted for habitats potentially affected by OE removal activities. These data are presented in annual monitoring reports including; *Fort Ord 1994 Annual Monitoring Report for Biological Baseline Studies at Unexploded Ordnance Sites* (*Harding ESE, 1994b*); *1995 Annual Biological Monitoring Report for Unexploded Ordnance Removal Sites at Former Fort Ord,* (*Harding ESE, 1995b*); *1996 Annual Monitoring Report Biological Baseline Studies and Follow-up Monitoring at Unexploded Ordnance Sites 10 East, 10 West, 11, 12 and 16 Presidio of Monterey Annex* (*Harding ESE, 1996*); *1997 Annual Monitoring Report Former Fort Ord,* (*Harding ESE, 1997*); and *1998 Annual Monitoring Report Biological Baseline Studies and Follow-up Monitoring at Unexploded Ordnance Sites at Former Fort Ord, Presidio of Monterey Annex, Monterey, California,* (*Harding ESE, 1998*), 1999 *Annual Monitoring Report, Biological Baseline Studies and Follow-up Monitoring at Unexploded Ordnance Sites on Former Fort Ord, Presidio of Monterey Annex, Monterey, California* (*Harding ESE, 1999b*), *2000 Annual Monitoring Report, Biological Baseline Studies and Follow-up Monitoring at Unexploded Ordnance Sites on Former Fort Ord, Presidio of Monterey Annex, Monterey, California.* (*Harding ESE, 2000a*).

3.2.4.3 Topography and Surface Waters

Elevations at the former Fort Ord range from approximately 900 feet above mean sea level (MSL) near Wildcat Ridge, on the east side of the base, to sea level at the beach. The predominant topography of the area reflects

morphology typical of the dune sand deposits that underlie the western and northern portions of the base. In these areas, the ground surface slopes gently west and northwest, draining toward Monterey Bay. Runoff is minimal because of the high rate of surface-water infiltration into the permeable dune sand; consequently, well-developed natural drainages are absent throughout much of this area. Closed drainage depressions typical of dune topography are common.

The topography in the southeastern third of the base is notably different from the rest of the base. This area has relatively well defined, eastward-flowing drainage channels within narrow, moderately to steeply sloping canyons draining into the Salinas Valley.

3.2.5 Subsurface Conditions

This section summarizes subsurface conditions at the former Fort Ord.

3.2.5.1 Geology

The former Fort Ord is within the Coast Ranges Geomorphic Province. The region consists of northwest-trending mountain ranges, broad basins, and elongated valleys generally paralleling the major geologic structures. In the Coast Ranges, older, consolidated rocks are characteristically exposed in the mountains but are buried beneath younger, unconsolidated alluvial fan and fluvial sediments in the valleys and lowlands. In the coastal lowlands, these younger sediments commonly interfinger with marine deposits.

The former Fort Ord is at the transition between the mountains of the Santa Lucia Range and the Sierra de la Salinas to the south and southeast, respectively, and the lowlands of the Salinas River Valley to the north. The geology of the former Fort Ord generally reflects this transitional condition; older, consolidated rock is exposed at the ground surface near the southern base boundary and becomes buried under a northward-thickening sequence of poorly consolidated deposits to the north. The former Fort Ord and the adjacent areas are underlain, from depth to ground surface, by one or more of the following older, consolidated units:

- Mesozoic granitic and metamorphic rocks
- Miocene marine sedimentary rocks of the Monterey Formation
- Upper Miocene to lower Pliocene marine sandstone of the Santa Margarita Formation (and possibly the Pancho Rico and/or Purisima Formations).

Locally, these units are overlain and obscured by geologically younger sediments, including:

- Plio-Pleistocene alluvial fan, lake, and fluvial deposits of the Paso Robles Formation
- Pleistocene eolian and fluvial sands of the Aromas Sand
- Pleistocene to Holocene valley fill deposits consisting of poorly consolidated gravel, sand, silt, and clay
- Pleistocene and Holocene dune sands
- Recent beach sand
- Recent alluvium.

The geology of the former Fort Ord is described in detail in Volume II of the Basewide RI, Basewide Hydrogeologic Characterization (*Harding ESE, 1995a*).

3.2.5.2 Hydrogeology

Recent studies of the former Fort Ord hydrogeology concluded that the base straddles two distinct groundwater basins, the Salinas and Seaside basins (*GTC, 1984; SGD, 1987*). The former Fort Ord includes the southwestern edge of the Salinas basin and the eastern portion of the smaller Seaside basin. The Salinas basin underlies the northern and southeastern portions of the base, and the Seaside basin underlies the

southern and southwestern areas. Basewide RI/FS sites with recognized groundwater contamination are limited to the Salinas groundwater basin at the former Fort Ord; therefore, only the Salinas basin is described herein.

The Salinas groundwater basin is relatively large and extends well beyond the boundaries of the former Fort Ord. At the former Fort Ord, the Salinas basin is composed of relatively flat-lying to gently dipping, poorly consolidated sediments. Although relatively simple structurally, the sediments are stratigraphically complex, reflecting a variety of depositional environments. Aquifers within the Salinas basin at the former Fort Ord, from top to bottom, include the unconfined A-aquifer, the confined Upper 180-foot aquifer, the confined and unconfined Lower 180-foot aquifer, and the confined 400-foot and 900-foot aquifers. These aquifer names reflect local historical water levels and are not directly correlated to present water levels at the former Fort Ord.

Groundwater extraction by the City of Marina, by the former Fort Ord, and by irrigation wells in the Salinas Valley have historically induced seawater intrusion into the Lower 180-foot and the 400-foot aquifers. Seawater intrusion continues to affect these aquifers. Intrusion into the Upper 180-foot aquifer appears to be limited to the vicinity of the beach at the former Fort Ord (*Harding ESE, 1999a*).

3.3 OE RI/FS Background

Since the base was selected for Base Realignment and Closure (BRAC) in 1991 and was officially closed in September 1994, OE removal actions have been performed and documented in preparation for transfer and reuse of the former Fort Ord property. The Ord Military Community (OMC), located within the Main Garrison portion of the former Fort Ord, will be retained by the Army. Since base closure in September 1994, lands outside the OMC have been subject to the reuse process. Some of the property on the Installation has been transferred. A large portion of the Inland Training Ranges was assigned to BLM. Other areas on the Installation have been or will be disposed to federal, state, local, and private entities through economic development conveyance, public benefit conveyance, negotiated sale, or other means.

The expanded reuse of the former Fort Ord increases the possibility of the public being exposed to OE hazards. In November 1998, the Army agreed to evaluate OE at the former Fort Ord in an OE RI/FS consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The OE RI/FS, which the Army is preparing to address OE hazards on the former Fort Ord, will include input from the community and will require regulatory agency review and approval. The OE RI/FS will evaluate past removal actions as well as recommend future remedial actions deemed necessary to protect human health and the environment under future uses.

The Army has been conducting OE sampling and removal actions at identified OE sites and will continue these actions to mitigate imminent OE hazards to the public while gathering data about the type of OE and level of OE hazard at each of the sites for use in the OE RI/FS. The Army is the lead agency delegated in Executive Order 12580 for OE removal activities at the former Fort Ord. However, regulatory agencies (U.S. Environmental Protection Agency [EPA] and the Department of Toxic Substances Control [DTSC] under the California Environmental Protection Agency) have been and will continue to be involved and provide input during OE removal and remedial activities. The Army is performing its activities in compliance with the detailed process described in the National Contingency Plan (NCP) for conducting a CERCLA remedial action. A Federal Facility Agreement (FFA) was signed in 1990 by the Army, EPA, and California Department of Health Services (now known as DTSC). The FFA established schedules for performing remedial investigations and feasibility studies and requires that remedial actions be completed as expeditiously as possible. In April 2000, an agreement was signed between the Army, EPA,

and DTSC to evaluate OE at the former Fort Ord subject to the provisions of the FFA. The OE RI/FS will contain a comprehensive evaluation of all OE-related data for the entire former Fort Ord and will evaluate long-term response alternatives for cleanup and risk management of OE.

4.0 INTERIM ACTION REMEDIAL INVESTIGATION

This section presents the Interim Action Remedial Investigation and summarizes general site information, vegetation status, OE-related information, and conceptual site models for each of the three IA sites. Their locations relative to neighboring communities are shown on Plate 2.

Typical Physical Characteristics

The predominant topography of the IA sites reflects morphology typical of dune sand deposits that underlie the sites. The IA sites are characterized by low rolling hills with elevations ranging from approximately 400 feet MSL to approximately 900 feet MSL. Surface and near-surface soil consists primarily of older dune sands and occasional exposures of the Aromas Sand Formation. Generally the ground surface slopes gently west and northwest with drainage toward Monterey Bay. Runoff is minimal because of the high rate of surface water infiltration into the permeable dune sand. Well-developed natural drainages are absent from the IA sites. Dominant vegetation in the IA sites is central maritime chaparral with patches of non-native grassland. Vegetation in portions of the IA sites is dense, which obscures the presence of OE.

Typical OE–Related Characteristics

The IA sites include Ranges 43-48, Range 30A, and Site OE-16 (Plates 3 through 10). Ranges 43-48 and 30A are part of the former Fort Ord MRA. Ranges 43-48 have been in use since the 1940s and were used for firing rockets, mortars, and various other projectiles. Range 30A was constructed in 1990 as a 40mm grenade range. The ranges typically consist of a firing line with firing positions with fixed and/or moving targets positioned down range. Targets are positioned at intervals specified in the particular range's Standard Operating Procedures (SOP). The targets include fixed silhouettes, truck-mounted moving targets, automobiles, trucks, tanks, and armored personnel carriers (APCs). Site OE-16 is a former World War II (WWII)-era 2.36-inch rocket and rifle grenade range. Even though no OE-related activities have been conducted at the IA sites in eight years, significant potential OE hazards have not become less significant with the passage of time. Many of the UXO items remaining have sensitive fuzing, are in deteriorating condition and are present on the ground surface, making conditions extremely hazardous.

Interim Action Sites at Fort Ord

The remedial investigations for each of the three IA sites are provided in the following sections as follows:

- **General Site Information**: Location, reuse, topography and geology, population, proximity and access, and history of use
- **Vegetation Status**: Type, density, and habitat designation
- **OE-Related Information**: Type, distribution, and quantity
- **Conceptual Site Model**: The basis for investigation design and identification of potential release and exposure routes.

4.1 Ranges 43–48

The Remedial Investigation for Ranges 43–48 is presented in the following section.

4.1.1 General Site Information

General site information for Ranges 43-48 is summarized below.

4.1.1.1 Location

Ranges 43-48 cover approximately 483 acres to the south of Eucalyptus Road in the south-

central portion of the former Fort Ord (Plate 3). The area is within the MRA, and includes several former firing ranges and a portion of Site OE-15MOCO.2. Former firing ranges established in this area at the time of base closure included Ranges 43, 44, 45, 46, 47, and 48. Other historic use of the area included a "Company Problems" training area.

The size of the IA site at Ranges 43-48 was originally proposed in the Draft IA RI/FS as 555 acres, including 72 acres planned for development. Upon review of the OE sampling data gathered from the development area, the USACE OE Safety Specialist determined vegetation within the 72 acres (Site OE-15SEA.4 and most of Site OE-15MOCO.2) could be safely be removed through mechanical methods. Therefore, the definition of the IA site at Ranges 43-48 has been revised as described above to include the remaining 483 acres.

4.1.1.2 Reuse

The majority of the IA site (472 acres) is designated as habitat reserve and will remain undeveloped (portions of BLM Parcels F1.4.2, F1.4.10.1, F1.4.10.2, F1.8, F1.9.1, F1.9.2, F1.10, F1.11.1, and F1.11.2). The remainder of the IA site (11 acres) includes the southern portion of Site OE-15MOCO.2 and contains the firing points for Ranges 44 and 45. Site OE-15MOCO.2 was identified based on a transfer parcel boundary and coincides with Transfer Parcel E21b.3. Future reuse of Transfer Parcel E21b.3 is development.

4.1.1.3 Topography and Geology

Elevations at Ranges 43-48 range from approximately 400 feet MSL near the firing point at Range 45 to approximately 550 feet MSL down range of Range 48 in the southwestern corner of the IA site. The topography of Ranges 43-48 is dominated by rolling terrain formed by Pleistocene-age dune deposits that may be up to 250 feet thick. These dune deposits cover the majority of the MRA. The mature plant communities described in Section 4.1.2 largely stabilize these widespread, unconsolidated deposits. This soil type is identified as "sand" in the Phase 2 EE/CA (*Army, 1998c*).

4.1.1.4 Population, Proximity, and Access

The area is adjacent to (less than 4000 feet from) residential neighborhoods (Fitch and Marshall Park) on the Ord Military Community and near the City of Seaside. The Fitch and Martin Luther King Jr. Middle Schools are located within 1 mile of Ranges 43-48. Ranges 43-48 were part of the Fort Ord MRA. The MRA is fenced and posted with signs warning of the dangers associated with unexploded ordnance. Existing access deterrents such as four-strand barbed-wire fencing with one to two rolls of concertina wire behind it that surrounds the MRA, chain link gates reinforced with concertina wire, and warning signs posted approximately every 500 feet along the fencing discourage, but do not prevent entry into the area. Several instances of unauthorized access by persons into the Range 43-48 IA site have been documented in the last few years. In 1999, there were two documented cases of children entering the fenced MRA at Ranges 44 and 45, and collecting and removing 40mm practice grenades found on the surface of the IA site. Although no one was injured in these incidents, it substantiates the premise that fences posted with warning signs deter, but do not prevent entry.

Personnel from the Army, BLM and USACE routinely check the MRA fences to ensure that they remain in good condition and to identify/complete needed repairs in a timely manner. The fences are maintained through an inter-service support agreement with BLM (*Army, 2001b*). Plate 2 shows the location of the IA site relative to surrounding communities and schools.

4.1.1.5 History of Use

The area included in this IA site contains several former firing ranges, some of which have been used for live fire exercises since at least the 1940s (Plate 3). The ranges were part of the Fort Ord range complex known as the MRA. Training facilities maps indicate that the ranges were used for a variety of different purposes and were active from the 1940s through the 1990s. In the 1940s the area included a Company Problems training area and a mortar range. In the 1950s, additional firing ranges were added including night firing and field firing ranges. In the 1960s, a rifle grenade range was added. The range configurations have remained roughly the same in this area since the mid-1960s. A description of the ranges in place in the area at the time of base closure, including information on ordnance use, is summarized below.

4.1.1.5.1 Ranges 43, 44, 45, 46, 47, and 48

- Range 43, located in the northeastern portion of the IA site, was in use as a platoon live fire course at the time of base closure. Troops fired and maneuvered down range using a trench system. Prior to this use, the range was used for mortar training. Records and recent field investigations indicate that the ammunition used or found at this range included 4.2-inch (high explosive [HE], white phosphorous [WP]), 60mm (training practice [TP], illumination), and 81mm (HE, WP, TP, illumination) mortars, 40mm grenades (HE, smoke, practice), 37mm low explosive (LE), 75mm (HE, shrapnel), 57mm (HE), 105mm (smoke, HE), and 155mm (smoke) projectiles, 66mm light antitank weapon (LAW), small arms, and fragmentation hand grenades.

- Range 44 was in use as an antitank weapons range at the time of base closure. The firing point for Range 44 was located within Site OE-15MOCO.2 with target sites located down range toward the southwest. Records and recent field investigations indicate that the ammunition used or found at this range included 35mm LAW sub-caliber, 66mm LAW high explosive antitank (HEAT), 66mm incendiary, 90mm recoilless rifle (RR) rounds (HE), 84mm incendiary, 40mm grenades (HE, practice), Dragon guided missiles (practice, HEAT) and practice anti-personnel mines. The former range fans and former target locations for all ranges located within this area are presented on Plate 3.

- Range 45 was in use as a grenade launcher range at the time of base closure. Range 45 was located adjacent to Range 44 and configured in roughly the same manner. Records and recent field investigations indicate that the ammunition used or found at this range included 40mm grenades (practice, HE, smoke, illumination), 35mm sub-caliber, 66mm LAW (HEAT from Range 44), 66mm incendiary, 14.5 sub-caliber, 22mm sub-caliber, 60mm mortars (HE, practice), hand grenades (illumination, smoke, practice), and practice anti-personnel mines.

- Range 46 was used as a small arms range from the late-1950s up to the time of base closure. The firing point for Range 46 was located within Site OE-15SEA.4 with target sites located to the southeast in front of an earthen berm. Records and field investigations indicate that the ammunition used at this range was restricted to small arms (pistols and rifles).

- Range 47, located in the western portion of the IA site just south of Site OE-15SEA.4, was established in and used through the 1960s as a 40mm grenade range. Firing was from the northwest toward the southeast. No field investigations have been conducted at this range. Records indicate that ammunition used at this range would have included 40mm grenades (HE).

- Range 48 was in use as a light antitank weapons range at the time of base closure. Range 48 was located on the western side of

the IA site. The firing point for Range 48 was located within Site OE-15SEA.4 (north of the IA site) with target locations located down range to the south. According to records the range was in use since the 1940s. The range was used for various purposes including weapons familiarization, and as a sniper range, mortar range, and machine gun range. Records and recent field investigations indicate that the ammunition used or found at this range included 4.2-inch (HE), 60mm (HE, TP, illumination), and 81mm (HE, WP, TP, illumination) mortars, 22mm sub-caliber, 57mm (HE), 75mm (HE), 84mm antitank (practice, HEAT), 40mm grenades (HE), 105mm (smoke, illuminating) and 155mm (smoke) projectiles, 2.36-inch (practice), 35mm (practice), 3.5-inch (practice), 66mm LAW (HEAT), and 66mm incendiary rockets, Dragon guided missiles (HEAT), rifle grenades (practice), antitank (practice) and practice anti-personnel mines, 106mm RR, illumination signals, small arms, and fragmentation hand grenades.

4.1.2 Vegetation Status

To maintain compliance with habitat management and monitoring requirements presented in the *Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California* (HMP) (*USACE, 1997*), biological resources within habitat reserve areas containing central maritime chaparral (CMC) are monitored after OE cleanup activities have been completed. The HMP identifies species and habitats of concern on the Installation and specifies mitigation measures to monitor the successful regeneration of species and habitat following OE Remedial Action. As part of the mitigation, follow-up monitoring would be conducted for a period of 5 years following OE Remedial Action to document effects of cleanup. Since the inception of the OE cleanup program, the Army has elected to augment the monitoring program, where feasible, to include the collection of baseline data prior to OE Remedial Action. In addition, annual reports are prepared to identify baseline habitat data and to document the success of the recovery of sensitive habitats.

Special-status species are considered to be those taxa that are listed, or are proposed for listing, as threatened or endangered under the state and federal Endangered Species Acts (ESAs), or are designated by state and federal agencies as species of concern. Table 1 provides a list of HMP species found at Fort Ord and their associated status.

Vegetation at Ranges 43 – 48 consists of central maritime chaparral (CMC) habitat sporadically interspersed with annual grassland habitats. Based upon species composition, CMC is divided into three successional stages: (1) mature habitat, (2) intermediate-age habitat, and (3) disturbed habitat.

Based upon field observations, a general pattern regarding successional stages of chaparral habitat was observed. These observations may not hold true for all of the ranges, as access to some areas was limited because of potential OE explosive hazards. In general, disturbed habitat was most often found between Ranges 42 and 45 and along old access roads. Mature and intermediate-age habitat appeared evenly distributed throughout the remainder of the ranges. As expected, intermediate-age chaparral was often found adjacent to grassland meadows transitioning toward mature as distance from the grassland meadow increased. However, tall, dense stands of mature chaparral habitat were frequently found adjacent to old access roads. A brief description of these successional habitats is provided below.

Mature Habitat

Dominant shrub species observed in mature habitat at Ranges 43–48 include shaggy-barked manzanita, chamise, and sandmat manzanita. Mature habitat typically supports the least diversity of shrubs, herbaceous species, bare ground, and grassland habitat. HMP annual herbaceous species are also typically the least prevalent in this successional stage of chaparral habitat. However, the seed bank underlying

chaparral shrub species does contain HMP annual herbaceous species that would be expected to regenerate and be observed following a burn. The central maritime chaparral community that occurs at Fort Ord is similar to other California chaparral associations, having herbaceous and shrub plant species which are considered dependent on fire for reproduction. Reproductive strategies that relate to the occurrence of fire include the release of dormancy by heating (Wright 1931); and the reduction or alteration of chemicals either on the seed coat or in the soil, which inhibit reproduction (*Muller 1966; Christensen and Muller 1975*). Several of these plant species are either uncommon or endemic to the Monterey Peninsula, and are subject to management provisions of the HMP. HMP shrub species observed in mature habitat include sandmat manzanita, Monterey ceanothus, and Eastwood's goldenbush. HMP herbaceous species observed in areas of bare ground within mature habitat include federally endangered and state threatened sand gilia, federally threatened Monterey spineflower, and state endangered Seaside bird's-beak.

Intermediate-Age Habitat

Dominant shrub species observed in intermediate-age habitat include shaggy-barked manzanita, sandmat manzanita, chamise, Monterey ceanothus, black sage, and dwarf ceanothus. Areas supporting bare ground and grassland habitat are also found in this successional stage, however, they are typically less prevalent than in disturbed habitat. HMP annuals typically are observed in areas of bare ground and grassland habitat. However, the seed bank underlying chaparral shrub species does contain HMP annual herbaceous species that would be expected to regenerate and be observed following a burn. The central maritime chaparral community that occurs at Fort Ord is similar to other California chaparral associations, having herbaceous and shrub plant species which are considered dependent on fire for reproduction. Reproductive strategies that relate to the occurrence of fire include the release of dormancy by heating (*Wright, 1931*); and the reduction or alteration of chemicals either on the seed coat or in the soil, which inhibit reproduction (Muller 1966; Christensen and Muller 1975). Several of these plant species are either uncommon or endemic to the Monterey Peninsula, and are subject to management provisions of the HMP. HMP shrub species observed in intermediate-age habitat include sandmat manzanita, Monterey ceanothus, and Eastwood's goldenbush. HMP herbaceous species observed in areas of bare ground within intermediate-age habitat include federally endangered and state threatened sand gilia, federally threatened Monterey spineflower, and state endangered Seaside bird's-beak.

Disturbed Habitat

Dominant shrub species observed in disturbed habitat include sandmat manzanita, shaggy-barked manzanita, chamise, and Monterey ceanothus. Areas of bare ground are typically most abundant in disturbed habitat. Disturbed habitat also typically has a larger component of HMP annual herbaceous plant species and grassland than intermediate-age or mature habitat. HMP annuals typically are observed in areas of bare ground and grassland habitat. In addition, the seed bank underlying chaparral shrub species does contain HMP annual herbaceous species that would be expected to regenerate and be observed following a burn. The central maritime chaparral community that occurs at Fort Ord is similar to other California chaparral associations, having herbaceous and shrub plant species which are considered dependent on fire for reproduction. Reproductive strategies that relate to the occurrence of fire include the release of dormancy by heating (*Wright, 1931*); and the reduction or alteration of chemicals either on the seed coat or in the soil, which inhibit reproduction (*Muller 1966; Christensen and Muller, 1975*). Several of these plant species are either uncommon or endemic to the Monterey Peninsula, and are subject to management provisions of the HMP. HMP shrub species observed in disturbed habitat include sandmat manzanita and Monterey ceanothus. HMP herbaceous species observed in disturbed habitat

include federally endangered and state threatened sand gilia, federally endangered Monterey spineflower, and state endangered Seaside bird's-beak.

4.1.2.1 Vegetation Type

Vegetation at the ranges consists of central maritime chaparral habitat occasionally interspersed with small areas of annual grassland. Central maritime chaparral habitat is divided into the following successional stages (categories): (1) disturbed habitat, (2) intermediate-age habitat, and (3) mature habitat as described below based on the 2000 Annual Monitoring Report (*Harding ESE, 2000a*). Sandmat manzanita was observed to be the dominant species in disturbed habitat, providing approximately one-half of overall vegetative cover. Shaggy barked manzanita and chamise dominate the remaining vegetative cover in disturbed habitat. Sandmat manzanita, chamise, and shaggy-barked manzanita were also observed to be the dominant species in intermediate-age chaparral habitat. Together, these three species provide approximately 75 percent of overall vegetative cover. Shaggy-bark manzanita provides over 60 percent of overall vegetative cover in mature chaparral habitat. Shrub species diversity was approximately the same for all three categories. However, abundance of species varies between successional stages and is typically greater in disturbance and intermediate-age stands of chaparral as compared with mature stands. The diversity and abundance of herbaceous plant species is also typically higher in disturbed stands of chaparral, followed by intermediate-age and mature stands, respectively. Additionally, bare ground is typically most abundant in disturbed stands followed by intermediate-age and mature stands, respectively.

4.1.2.2 Vegetation Density

The substrate over much of the ranges is composed of loose, sandy soils. Vegetation is often densely knitted together, and the composition, texture, thickness, and resistance of the vegetation vary by species, community composition, and area. In some areas the vegetation is a dense knit of small but stiff stems; in other areas the shrubs are dominated by large stems with a canopy of leaves held well above the ground.

4.1.2.3 Habitat Designation

Two distinct areas have been delineated for inclusion as an IA site at Ranges 43–48: Habitat Reserve and Development Areas as described below.

4.1.2.3.1 Habitat Reserve Areas (Ranges 43, 44, 45, 46, 47, and 48)

The Habitat Reserve Area includes approximately 472 acres designated for habitat reserve out of the total 483-acre site (Plate 3). The need for interim action within this area was determined based on the presence of live, sensitively fuzed 4.2-inch, 57mm, 60mm, 75mm, 81mm, and 84mm HE projectiles, 40mm HE projectiles, and 66mm HEAT rockets. A detailed list of the UXO and ordnance scrap items found and removed from the Habitat Reserve Area during sampling is provided in Table 2. The sample grid locations are presented on Plate 4.

4.1.2.3.2 Development Areas (OE-15MOCO.2 and OE-15SEA.4)

Approximately 11 acres of Development Area lie within this IA site (Plate 3). The 11-acre area includes the portions of Ranges 44 and 45 that extend outside of the 472-acre Habitat Area. The cleanup in the remainder of the Development Area (72 acres) is being considered for completion under a different program and is not part of this IA. A detailed list of the UXO and ordnance scrap items found and removed from the development area during sampling is provided in Table 2. The sample grid locations are presented on Plate 4.

4.1.3 OE-Related Information

The following sections provide a summary of OE-related information for Ranges 43-48.

4.1.3.1 Site Characterization Activities

Information used to characterize this area was collected during several field investigation activities. Sampling in the IA site included grid sampling, fuel break clearance, trail clearance, road clearance, range clearance, and site-specific grid sampling conducted as part of the OE-15SEA group and OE-15MOCO.2 sampling. Most of the field investigations were conducted along roads and behind firing lines where the threat from explosive hazards was less than in the vicinity of the targets. Additionally, a portion of OE-15SEA.4 (associated with Range 46) was cleared of OE in support of remediation of spent small arms ammunition and lead contaminated soil. The locations of the sample grids associated with this activity are shown on Plate 4. The investigation and remediation of small arms ranges was conducted as part of the Basewide RI/FS (*Harding ESE, 1995a*) and is not addressed as part of the OE cleanup program. Following the sampling and clearance activities, a Time Critical Removal Action (TCRA) was conducted at Ranges 43-48. The TCRA, which included the removal of only surface UXO and OE scrap, was completed to reduce the threat to public safety posed by the presence of UXO at the IA site. Details of the site-specific OE characterization activities are described below. A detailed list of the UXO and ordnance scrap items (including the number found and removed) found during sampling, grouped by investigation activity, is provided in Table 2.

4.1.3.2 Summary of Field Activities Completed to Date

Grid sampling was performed within selected areas in the MRA to collect data regarding the type, depth, and distribution of OE present in areas behind the firing lines to support the OE investigation (Plate 4). Grid sampling is a method whereby all geophysical anomalies identified within a designated grid (here 100-by 100-foot grids) are investigated. Within the Ranges 43-48 area originally identified as an IA site, six 100 by 200 Grid Stat/Site Stat grids were sampled as part of the MRA sampling effort (G-1, G-2, G-3, G-13, G-14 and, G-15). The grids were investigated to a depth of four feet (Plate 4). Two UXO items including a HEAT guided missile and a WP smoke mortar (G-15) and numerous ordnance scrap items including practice 40mm grenades (G-1), practice 3.5-inch rockets (G-2), and a 81mm training mortar (G-15) were found and removed during this sampling activity.

Road clearances were performed within selected portions of the MRA to facilitate travel during field sampling activities. Maverick Road was included in the MRA road clearance. The Maverick Road clearance was composed of contiguous 15- by 110-foot grids cleared to a depth of four feet. Numerous UXO and ordnance scrap items were found during the Maverick Road clearance during sampling activities, including practice, high explosive, illuminating and smoke mortars and projectiles, practice rockets, fuzes and practice anti-personnel mines.

A 30-foot wide fuel break composed of contiguous 30- by 110-foot grids along the southern boundary of Sites OE-15MOCO.2 and OE-15SEA.4 were subjected to a complete removal to a depth of four feet over each grid (Plate 4). A portion of the fuel break was to include areas with known heavy concentrations of ordnance items associated with firing Ranges 44 and 45. For safety reasons the fuel break clearance was moved to the south. A 15-foot wide trail to the south was cleared to a depth of four feet to reach the western most extent of the relocated fuel break. The relocated fuel break was composed of contiguous 30- by 100-foot grids extending to the east and then to the north to Site OE-15MOCO.2 (Plate 4). UXO and ordnance scrap items found during this removal activity included practice,

illuminating, HE, HEAT, shrapnel, and smoke mortars and projectiles, practice and HEAT rockets, a HEAT guided missile, a practice antitank mine, practice hand and rifle grenades, fuzes and illumination signals.

Fuel breaks were also placed along the western and southern margins of the IA site and along the south side of Eucalyptus Road. The fuel break on the south side of Eucalyptus Road was comprised of 15x100-foot grids and the fuel break completed along the western and southern perimeter of the IA site was comprised of 50x100-foot grids `(Plate 4). No UXO or ordnance scrap items were found within the fuel break on the south side of Eucalyptus Road. Clearance of the fuel break along the western and southern perimeter resulted in the finding of numerous UXO and ordnance scrap items including HE, practice, illuminating, and WP smoke mortars and projectiles, HEAT guided missiles, practice and HEAT rockets, and fuzes.

Subsequent to the removal along the fuel break, site-specific grid sampling was performed within Sites OE-15MOCO.2 and OE-15SEA.4. Site-specific grid sampling at Site OE-15MOCO.2 included the sampling of twenty six (26) 100 foot by 100 foot grids throughout the site. Site-specific grid sampling within the portion of Site OE-15SEA.4 located on the north side of the IA site included the sampling of ten (10) 100- by 100-foot grids. UXO as well as ordnance scrap items including practice, shrapnel, HE and LE mortars and projectiles, practice rockets, hand grenade and projectile fuzes, a practice anti-personnel mine, illumination signals and practice, illuminating, and smoke hand grenades were found during the site-specific grid sampling at Site OE-15MOCO.2 and Site OE-15SEA.4.

Additional work was completed within two of the former ranges (44 and 45). The sampling at Range 44 included the clearance of a 15-foot wide trail to a depth of four feet. The trail was cleared to allow safe entry of personnel conducting soil characterization activities and equipment. One (1) 100- by 100-foot grid was established and sampled in Range 44. Sampling was performed on the surface only within the Range 44 grid. Surface sampling was also completed within a portion (11.5 acres) of Range 45 (Plate 4). The portion of the range cleared included the area around former target locations. Over one hundred UXO items including HE and smoke projectiles, HEAT, incendiary and practice rockets, illumination signals, fuzes, and an incendiary hand grenade, as well as over 1500 expended 40mm practice projectiles, were found during the sampling at Range 44 and 45.

A portion of Site OE-15SEA.4 was cleared of OE during site preparation in support of the remediation of spent small arms ammunition and lead contaminated soil at Range 46. The area cleared included a small arms target area and a staging area for crews and equipment, and access and egress routes. A total of twenty-five (25) 100- by 100-foot grids were cleared to a depth of four feet in the vicinity of Range 46 (Plate 4). One UXO item (smoke grenade) and two OE scrap items (practice grenade and projectile fuze) were found during the grid sampling in support of the Range 46 lead remediation.

A TCRA was conducted at Ranges 43-48 to remove surface ordnance easily accessible to trespassers. For safety reasons, ordnance crews were limited to accessing areas with little or no vegetation and no vegetation was removed as part of this removal action. Thousands of UXO and OE scrap items were found and removed during the TCRA, including high explosive, high explosive antitank, practice, and incendiary rockets, high explosive, illuminating, and practice mortars, high explosive, high explosive antitank, shrapnel, practice, illuminating, and smoke projectiles, fuzes, flares, practice missiles, and smoke and illuminating hand grenades.

The results of the limited sampling and removal activities completed to-date indicate that ordnance is distributed throughout the IA site. Additional information regarding the distribution of ordnance at the site will be generated during the interim action.

4.1.4 Conceptual Site Model

Conceptual site models (CSMs) are developed during preliminary site characterization phases to provide a basis for investigation design and identification of potential release and exposure routes. CSMs usually incorporate information regarding the physical features and limits of the area of concern (the site), nature and source of the contaminant (in this case OE/UXO), and exposure routes (potential scenarios that may result in contact with OE/UXO).

The CSM for Ranges 43–48 is based on currently available site-specific and general information including literature reviews, sampling results, aerial photos, maps, technical manuals, and field observations, and the information shown on Plate 5. After the completion of the Interim Action at Ranges 43-48, data collected will be used to further refine the CSM, which will be included in the basewide Ordnance and Explosives Remedial Investigation/Feasibility Study (basewide OE RI/FS).

Ranges 43–48 are categorized as firing ranges, where personnel were trained in the use of live and practice OE. Firing ranges are areas that were intentionally constructed and/or were used for training personnel in the use of live ordnance and small arms (Plate 5). Firing ranges usually consist of a firing line, firing points, and the target area. The firing line is the line from which weapons are fired and no one is permitted forward of the firing line during the firing of weapons. The firing points are numbered positions to which personnel are assigned. The target area is the point or location at which the weapon is fired. Depending on the historical use of the firing range, it may contain surface and subsurface UXO (including high explosives and pyrotechnics) that may present an explosive hazard to the public. The hazard level would be influenced directly by the type of UXO, the proximity of the UXO to the surface, the accessibility of the site to the public, and the activities the public may engage in when trespassing onto the site.

4.1.4.1 Site Features

For the purposes of this IA RI/FS, the conceptual site model for Ranges 43- 48 is discussed here as a single area of concern because of the similarity of ordnance types, the overlapping range fans, the likelihood that similar types of OE/UXO are distributed throughout the site, and potential access/exposure routes to receptors. Only Range 46 appears to have been used exclusively for small arms training throughout its existence. However, because it is flanked and overlapped by adjacent ranges that have been used for training with high explosives, it is also expected to contain UXO. Targets on Ranges 43-48 were either placed in specified patterns or randomly placed and consisted of armored personnel carriers (APCs), trucks, dumpsters, and steel silhouettes (Plate 3). Distance to existing targets from the firing lines at each range depended on the type of training performed at the time of base closure. Placement of targets varies from rows and groupings of targets (Range 45) to vehicles placed in front of, behind, and on top of ridges (Range 48).

4.1.4.2 Potential Sources and Location of OE/UXO

Ranges 43–48 had been used for live fire exercises from at least the 1940s to base closure. Available information indicates the ranges were used for training with a variety of different ordnance including mortars, rockets, rifle and hand grenades, projectiles, practice mines, and missiles. The range configurations have remained roughly the same in this area since the mid-1960s. Information regarding the past use of individual ranges is presented in Section 4.1.3. Training was performed using indirect and direct fire weapons. In general, indirect fire is long range fire from weapons such as artillery and mortars at targets that may or may not be visible within the range. Direct fire is generally shorter in distance and usually consists of firing at visible targets using ordnance such as 40mm grenade launchers, bazookas, and LAW rockets. Because

Ranges 43- 48 were used for a variety of direct and indirect fire weapons, UXO is known or expected to be distributed throughout the ranges on the surface and in the subsurface. UXO could be located as close as targets used for thrown hand grenades and as far as 2,400 meters or more for ordnance such as mortars. Other potential sources of OE/UXO could include firing lines and burial pits, which have yet to be evaluated.

4.1.4.3 Potential Exposure Routes

Access to Ranges 43-48 is currently restricted to authorized personnel only. Potential exposure to OE/UXO by unauthorized persons has occurred and could occur through trespassing incidents. An Ordnance and Explosives Site Security Program Summary (*Army, 2001b*) to mitigate such incidents is currently being implemented by the Army. However, the Army has determined that a threat to human health (public safety) or welfare exists at the sites for the following reasons:

- Areas in and around the former firing ranges contain large quantities sensitively fuzed, highly dangerous UXO such as 40mm, 57mm, 60mm, 66mm, 81mm, and 84mm HE and HEAT projectiles and mortars, present on the ground surface or predominantly within the uppermost one foot of soil.

- Existing access deterrents such as barbed-wire fencing, concertina wire, and chain link gates posted with warning signs discourage, but do not prevent entry into the sites. Trespassers may knowingly or unknowingly come in contact with these items and cause them to detonate.

- Recent exposures (without injuries) have been documented through instances of unauthorized access into the MRA by persons, including children, who have removed training items and ordnance related scrap. In the last three years, five incidences of persons trespassing into the Range 43-48 area occurred.

- OE workers will have direct contact through physical disturbance of OE/UXO during remediation operations. Trespassers may have contact through intentional disturbance such as removal of an item, or unintentional contact through ground pressure as they walk over the item.

4.2 Range 30A

The Remedial Investigation for Range 30A is presented in the following section.

4.2.1 General Site Information

General site information for Range 30A is summarized below.

4.2.1.1 Location

Range 30A includes approximately 388 acres located in the southeastern portion of the MRA, approximately 1,500 feet north of South Boundary Road and to the west of Barloy Canyon Road (Plate 6). Range 30A lies adjacent to former Firing Ranges 29, 30, and 31. This IA site consists of approximately 400 acres of land that includes the former 30A Firing Range. The IA site was delineated based on the presence of 40mm HE projectiles and is designated as habitat reserve.

4.2.1.2 Reuse

As part of the closure of Fort Ord, the MRA will be transferred to the BLM and most of the MRA will remain undeveloped as habitat reserve. The HMP for Former Fort Ord (*USACE, 1997*) presents the revised boundaries of the habitat reserve areas and describes special land restrictions and habitat management requirements for habitat management target species within the HMP reserve areas. Management of the habitat reserve area will fall under the jurisdiction of BLM.

4.2.1.3 Topography and Geology

Elevations at Range 30A range from approximately 900 feet MSL near the Range 30A firing points to approximately 550 feet MSL at the northwest end (down range) of the IA site. The topography dips gently toward the northwest and contains a small closed drainage depression trending generally from southeast to northwest. The rolling topography is typical of terrain formed by Pleistocene-age dune deposits that may be up to 250 feet thick. These dune deposits cover the majority of the MRA. The mature plant communities described in Section 4.2.2 largely stabilize these widespread, unconsolidated deposits. This soil type is identified as "sand" in the Phase 2 EE/CA (*Army, 1998c*).

4.2.1.4 Population, Proximity, and Access

The Range 30A IA site is located in close proximity (approximately 2,200 feet north) to the Laguna Seca residential area and Laguna Seca Golf Course, and less than a mile from the Laguna Seca Raceway as shown on Plate 2. South Boundary Road, located approximately 2,000 feet to the south, is open to vehicular traffic during events at Laguna Seca Raceway and is always open to the public for jogging, hiking, and biking. Range 30A is part of the Fort Ord MRA. The MRA is fenced and posted with signs warning of the dangers associated with unexploded ordnance. Existing access deterrents such as four-strand barbed-wire fencing with one to two rolls of concertina wire behind it that surrounds the MRA, chain link gates reinforced with concertina wire, and warning signs posted approximately every 500 feet along the fencing discourage, but do not prevent entry into the area. Several instances of unauthorized access by persons including children trespassing into the MRA within thousands of feet of Range 30A have been documented. Personnel from the Army, BLM and USACE routinely check the MRA fences to ensure that they remain in good condition and to identify/complete needed repairs in a timely manner. The fences are maintained through an inter-service support agreement with BLM (*Army, 2001b*). Plate 2 shows the location of the IA site relative to surrounding communities and schools.

4.2.1.5 History of Use

Range 30A was constructed in 1990 as a 40mm machine gun range and was in use until 1993. This range included four firing lanes with targets spaced at 400, 600, 800, 1,100, and 1,500 meters from the firing points. According to the Fort Ord Training Ranges Standard Operating Procedure (SOP), the only weapon authorized for use at Range 30A from 1991 and 1992 was the MK19 40mm machine gun, Mod 3. Ammunition authorized for use at Range 30A included HE and TP. The MK19 has a maximum range of 2,200 meters.

Additionally, helicopter firing points were located to the east of Range 30A. The direction of fire from the helicopter firing points was from east to west with some of the targets being located in the vicinity of Range 30A. Because some of the helicopter targets were located near Range 30A, the possibility exists that ordnance fired from the helicopters (typically 40mm projectiles) may have landed within the Range 30A IA site.

4.2.2 Vegetation Status

The dominant shrub species observed at Range 30A are the same as or similar to those found at Ranges 43-48 as described in Section 4.1.2. The following species are dominant at Range 30A and in general, are distributed throughout mature, intermediate-aged, and disturbed habitat: (1) shaggy-barked manzanita, (2) chamise, (3) sandmat manzanita, and (4) Monterey ceanothus. Table 1 provides a list of HMP species found at Fort Ord and their associated status.

4.2.2.1 Vegetation Type

Baseline chaparral data has not been collected at Range 30A. Vegetation type and density at Range 30A is based upon a review of aerial photographs and the results of the *Annual Monitoring Report for Biological Baseline Studies at Unexploded Ordnance Sites* (*USACE, 1994*). Range 30A appears to be dominated by mature chaparral habitat. Mature chaparral habitat is evenly distributed over approximately 90 percent of the site. A few areas of bare ground are also located on this site. The largest area of bare ground is located parallel to the existing access road. HMP herbaceous annual species are most likely to be found in the bare ground area located on Range 30A. Baseline surveys conducted in the vicinity of the IA site (*Harding ESE, 2001a*) observed that disturbed habitat was often found along unused access roads.

4.2.2.2 Vegetation Density

Based on aerial photographs and the results of the *Annual Monitoring Report for Biological Baseline Studies at Unexploded Ordnance Sites* (*USACE, 1994*), the most dominant shrub species at Range 30A include shaggy-barked manzanita and chamise. It is estimated that these two species provided over 60 percent of the overall vegetative cover at Range 30A. The density estimates of species in disturbed habitat are not available for this site. Maps provided by Jones & Stokes Associates, Inc. from 1996 show a low density of Monterey spineflower exists on Range 30A.

4.2.2.3 Habitat Designation

Range 30A is located in BLM Parcels F1.11.1 and F1.7.1. The HMP identifies Range 30A as a habitat reserve area, which will be maintained as an open space area that will not be used for development. Habitat reserve areas support plant and animal species that require implementation of mitigation measures identified in the HMP to ensure compliance with the ESA and to minimize potential adverse impacts to listed species.

4.2.3 OE-Related Information

This section provides a summary of OE-related information.

4.2.3.1 Site Characterization Activities

To date, only limited OE sampling has occurred within the Range 30A IA site. Limited OE data was collected as part of the MRA grid sampling and during the establishment of a fuel break around the perimeter of the range. The TCRA, which included the removal of only surface UXO and OE scrap, was completed to reduce the threat to public safety posed by the presence of UXO at the IA site. A detailed list of UXO and ordnance scrap items (including the number found and removed), grouped by investigation activity, is provided in Table 3.

4.2.3.2 Summary of Field Activities Completed To-Date

Within the Range 30A IA site, two grids were sampled as part of the MRA sampling effort (G-3 and G-40). The grids were sampled to depths of four feet and every discovered anomaly was investigated (Plate 6). Neither MRA grid was located within the range fan associated with Range 30A. Several OE scrap items (37mm and 57mm TP projectiles, and 76mm projectile canisters) were found and removed from Grid G-40. No ordnance items were found within Grid G-3.

Additional OE data was gathered as part of the clearance of a fuel break around the perimeter of Range 30A. UXO items found within the fuel break included HE, LE, shrapnel, smoke, and illumination projectiles, and smoke grenades. OE scrap items found included 60mm and 81mm HE, illumination, WP, and smoke mortars, 37mm HE and LE, practice and armor piercing training projectiles, 40mm practice and smoke projectiles, 8-inch, 75mm, 105mm, and 155mm shrapnel and high explosive projectiles,

projectile fuzes, flares, and WP and smoke hand grenades.

A Time Critical Removal Action (TCRA) was conducted at IA Site Range 30A to remove surface ordnance easily accessible to trespassers. No vegetation was cut for this action. For safety reasons, ordnance crews were limited to accessing areas with little or no vegetation. UXO and ordnance scrap items found and removed during the TCRA included high explosive and practice mortars, and high explosive and shrapnel projectiles.

Because of the limited sampling performed at Range 30A little information is known concerning the distribution of ordnance at this site. It is anticipated that heavy concentrations of UXO and ordnance scrap are present within Range 30A. Additional information regarding the distribution of ordnance at the IA site will be generated during the OE Remedial Action process.

4.2.4 Conceptual Site Model

This section presents the conceptual site model (CSM) for Range 30A, which is based on currently available site-specific and general information including literature reviews, sampling results, aerial photos, maps, technical manuals, field observations, and the information shown on Plate 7. Depending on the vegetation clearance alternative chosen to support the OE remedial action at Range 30A, portions of other ranges to the south such as Range 28, 29, and 30 may or may not need to be incorporated into the area of remediation. Information regarding the past use of the range is also presented in Section 4.2.1.

A discussion of the process for developing a CSM and the types of information that are incorporated has been provided in Section 4.1.4. As described earlier, conceptual site models (CSMs) are developed during preliminary site characterization phases to provide a basis for investigation design and identification of potential release and exposure routes. As described in Section 4.2.3, limited sampling has been conducted in the vicinity of, but not within Range 30A. Therefore, the CSM for this range is based largely on available information resulting from analysis of literature, aerial photos, maps, technical manuals, range design drawings, and field observations. After the completion of the Interim Action at Range 30A, data collected will be used to further refine the CSM, which will be included in the future basewide ordnance and explosives remedial investigation/feasibility study (OE RI/FS). Information regarding the adjacent ranges is provided below to supplement the CSM. The hazard level would be influenced directly by the type of UXO, the proximity of the UXO to the surface, the accessibility of the site to the public, and the activities the public may engage in when trespassing onto the site.

4.2.4.1 Site Features

Range 30A was constructed in 1990 and used as an MK19 machine gun range from 1990 through 1993. Based on drawings from available files, the range consisted of a firing line with four firing points and dumpster/steel silhouette target groups for each firing point located at distances of 400, 600, 800, 1,100, 1,500, and 2,100 meters from the firing line. Recent field investigations identified two additional target groups outside the boundaries of the IA site. The range is situated such that firing occurred from the firing line positioned on an approximately east-west trending ridge toward targets within the broad flat valley to the northwest (Plate 7).

Range control maps and files show seven helicopter firing points and up to six targets in the vicinity of Range 30A as early as 1982. Firing generally occurred from the east side of the MRA toward the center or High Impact Area. SOPs for this area also indicate that instructional areas for practice mine and demolitions training (labeled “Minefield Training Area” on some diagrams), were available. This training area was described as a sandy area that could be used for practice mine placement and clearing. Several of the helicopter range fans overlap the area. Although only one of the helicopter targets is within

Range 30A, the range fans associated with the helicopter firing points overlap Range 30A suggesting that UXO from those training activities may be found within the area of concern.

Ranges 28, 29, and 30 to the west were used primarily as small arms ranges with some use of subcaliber LAW and 40mm target practice ammunition.

4.2.4.2 Potential Sources and Location of OE/UXO

Range 30A had been used for live fire exercises from 1990 to 1993. Available information indicates the range was used for training with the MK19 machine gun, which fired 40mm TP, HE, and high explosive dual purpose (HEDP) projectiles. UXO is known or expected to be distributed throughout the range on the surface and in the subsurface. Other potential sources of OE/UXO could include firing lines and burial pits, which have yet to be evaluated.

Adjacent Ranges 28, 29, and 30 likely contain UXO in the form of undetonated practice rounds such as the sub-caliber LAW items mentioned above, which contain spotting charges. Based on available records, no high explosive ammunition was authorized on Ranges 28, 29, and 30. However, because of the variety of historical range use at former Fort Ord, the presence of other UXO items in these ranges cannot be discounted.

The presence of at least one helicopter target within Range 30A and multiple helicopter range fans overlapping Range 30A suggests that UXO from those training activities is also likely to be within the area of concern. The records indicate that 40mm, 20mm, and 7.62mm ammunition was authorized.

4.2.4.3 Potential Exposure Routes

Access to Range 30A and adjacent Ranges 28, 29, and 30 is currently restricted to authorized personnel only. Potential exposure to OE/UXO by unauthorized persons has occurred and could occur through trespassing incidents. An Ordnance and Explosives Site Security Program (*Army, 2001b*) to mitigate such incidents is currently being implemented by the Army. However, the Army has determined that a threat to human health (public safety) or welfare or the environment exists at the sites for the following reasons:

- Areas in and around the former Range 30A are known to contain sensitively fuzed, highly dangerous UXO in the form of 40mm HE and HEDP projectiles. Because of their light-weight and low trajectory, they are expected to be present on the ground surface or predominantly within the uppermost one foot of soil.

- Existing access deterrents such as barbed-wire fencing, concertina wire, and chain link gates posted with warning signs discourage, but do not prevent entry into the sites. Trespassers may knowingly or unknowingly come in contact with these items and cause them to detonate.

- Recent exposures (without injuries) have been documented through instances of unauthorized access by persons including children into the MRA and removal of ordnance scrap. In 2001 alone, two incidences of damaged fencing that may have been caused by trespassers occurred within 2,000 feet of Range 30A (near Range 30), and three other incidences of fence damage were reported within 4,000 feet of the range (near Range 29). In addition, two known incidences of persons trespassing into Range 27A occurred within 8,000 feet of Range 30A in the last two years.

- OE workers will have direct contact through physical disturbance of OE/UXO during remediation operations. Trespassers may have contact through intentional disturbance such as removal of an item, or unintentional contact through ground pressure as they walk over the item.

4.3 Site OE-16

The Remedial Investigation for Site OE-16 is presented in the following section.

4.3.1 General Site Information

General site information for Site OE-16 is summarized below.

4.3.1.1 Location

Site OE-16 includes approximately 80 acres located adjacent to and to the north of the MRA, between Eucalyptus and Parker Flats roads and bounded by Watkins Gate Road to the east (Plate 8). This IA site consists of Site OE-16, including approximately 80 fenced acres of land located to the north of Eucalyptus Road, bounded by Parker Flats Road to the north and Watkins Gate Road to the East (Plate 8). Site OE-16 is a former WWII-era 2.36-inch rocket range. The IA site was delineated based on the presence of HE rockets and rifle grenades and is designated as habitat reserve.

4.3.1.2 Reuse

The land that includes Site OE-16 will be transferred to the BLM. This area will become habitat reserve and will remain undeveloped. The HMP for Former Fort Ord (*USACE, 1997*) presents the revised boundaries of the habitat reserve areas and describes special land restrictions and habitat management requirements for habitat management target species within the HMP reserve areas. Management of the habitat reserve area will fall under the jurisdiction of BLM.

4.3.1.3 Topography and Geology

Elevations at Site OE-16 range from approximately 420 feet MSL near the western end to approximately 450 feet MSL at the eastern end of the IA site. The western end of the IA site is relatively flat sloping gently upward to the west and north. This gently rolling terrain is typical of the Pleistocene-age dune sand deposits in this area. These dune deposits may be as much as 250 feet thick. The mature plant communities described in Section 4.3.2 largely stabilize these widespread, unconsolidated deposits. This soil type is identified as "sand" in the Phase 2 EE/CA (*Army, 1998c*).

4.3.1.4 Population, Proximity, and Access

Site OE-16 is located adjacent to the MRA and land that has been transferred to the BLM. The BLM land (immediately adjacent) is open to the public for hiking, biking, jogging, and horseback riding. The IA area (Site OE-16) is surrounded by a temporary 6-foot high chain linked fence posted with signs warning of the dangers associated with unexploded ordnance. The area is in close proximity (approximately one mile) to a residential neighborhood (Fitch Park) on the former Fort Ord. Existing access deterrents such as temporary 6-foot high chain linked fence and a chain link gate posted with warning signs approximately every 500 feet along the fencing discourage, but do not prevent entry into the area. Several instances of unauthorized access by persons into the adjacent MRA have been documented. Personnel from the Army, BLM and USACE routinely check the MRA fences to ensure that they remain in good condition and to identify/complete needed repairs in a timely manner. The fences are maintained through an inter-service support agreement with BLM (*Army, 2001b*). Plate 2 shows the location of the IA site relative to surrounding communities and schools.

4.3.1.5 History of Use

Site OE-16 is a WWII-era rocket range. The area is identified as a "bazooka practice" area on Fort Ord Training Facilities maps dating from 1945 and 1946. Available training maps after 1946 do not identify the bazooka practice area. According to Fort Ord Range Control, this range was probably used as an antitank rocket range

during and shortly after WWII (*Harding ESE, 1994a*). The antitank range was reported to cover an area approximately 400 meters long and 300 meters wide. A portion of a narrow gauge railroad track used to carry moving targets is present on the western end of the range. Other training sites in this area identified on later training maps include a "squad tactics" site (1954 through 1958), a "recoilless rifle training area" (1964 through 1972), a "bivouac area" (1964 through 1984), "concurrent mortar training area" (1972 through 1976), and an "anti-armor training area" (1978 through 1987). According to a range control officer, "concurrent training" referred to "dry fire" (nonfiring) exercises performed prior to conducting live fire training in the MRA, south of Eucalyptus Road.

4.3.2 Vegetation Status

The dominant shrub species observed at Site OE-16 are the same as or similar to those found at Ranges 43-48 as described in Section 4.1.2. The following species are dominant at Site OE-16 and in general, are distributed throughout mature, intermediate-aged, and disturbed habitat: (1) shaggy-barked manzanita, (2) chamise, (3) sandmat manzanita, (4) Monterey ceanothus, and (5) black sage. Table 1 provides a list of HMP species found at Fort Ord and their associated status.

4.3.2.1 Vegetation Type

Baseline conditions for Site OE-16 are documented in the 1996 Annual Monitoring Report (*Harding ESE, 1996*). Vegetation at the site in 1996 consisted primarily of mature chaparral habitat. Along the southern edge of Site OE-16, portions of the site contain grassland habitat. Intermediate-age chaparral habitat has been documented to frequently occur adjacent to grassland meadows transitioning toward mature habitat. A review of aerial photographs indicates many of the access roads are overgrown with vegetation. Baseline surveys conducted in the in the vicinity of the IA site (*Harding ESE, 2001a*) showed that disturbed habitat was often found along unused access roads. Species composition and density is not collected in grassland habitats. The HMP does not require vegetation monitoring for grassland habitats.

4.3.2.2 Vegetation Density

Dominant shrub species observed in mature habitat at Site OE-16 include shaggy-barked manzanita, chamise, Monterey ceanothus, tooth-leafed ceanothus, and sandmat manzanita. These species contributed approximately 63 percent of the overall vegetative cover. Reviews of aerial photographs show that the density of mature habitat has increased. HMP shrub species observed at this site included Monterey ceanothus (11.16 percent), Hooker's manzanita (0.72 percent) and sandmat manzanita (9.18 percent). Bare ground (13.91 percent) and herbaceous cover (9.55 percent) were high at this site. The *Fort Ord 1994 Annual Monitoring Report for Baseline Studies at Unexploded Ordinance Sites* (*USACE, 1994*) states that Monterey spineflower is known to exist. Surveys for HMP herbaceous annual species conducted at Site OE-16 in 1996 identified low densities of Monterey spineflower at the edges of coast live oak woodland and grasslands and in openings in coastal scrub and chaparral (*Harding ESE, 1996*)

4.3.2.3 Habitat Designation

Site OE-16 is located in Transfer Parcel F1.3. The HMP identifies Site OE-16 as a habitat reserve area, which will be maintained as an open space area that will not be used for development. Habitat reserve areas support plant and animal species that require implementation of mitigation measures identified in the HMP to ensure compliance with the ESA and to minimize potential adverse impacts to listed species.

4.3.3 OE-Related Information

This section provides a summary of OE-related information for Site OE-16.

4.3.3.1 Site Characterization Activities

Limited sampling activities have occurred at Site OE-16. Information used to characterize the site was generated during fire training and fuel break clearance activities, and during field trials conducted as part of the Ordnance Detection and Discrimination Study (ODDS; *USACE, 2001*). The TCRA, which included the removal of only surface UXO and OE scrap, was completed to reduce the threat to public safety posed by the presence of UXO at the IA site. A detailed list of the UXO and ordnance scrap items (including the number found and removed), grouped by investigation activity is provided in Table 4.

4.3.3.2 Summary of Field Activities Completed to Date

Limited sampling activities have occurred at Site OE-16. Initial OE-related information for Site OE-16 was generated during wildland fire-fighting training activities that occurred near there in 1991. During a controlled burn of land immediately adjacent (to the northeast) of Site OE-16, numerous 2.36-inch rockets and rifle grenades were found, some of which contained high explosive filler. On the basis of this discovery, a recommendation was made to perform an OE clearance over the burned area. Approximately 1,000 rockets were removed as a result of the clearance.

In 1998 a 30-foot wide fuel break composed of contiguous 30- by 110-foot grids placed around the perimeter of the site were subjected to a complete removal to a depth of four feet over each grid (Plate 8). Numerous UXO and ordnance scrap items including, HE and practice 2.36-inch rockets, practice antitank mines, HEAT, practice, and smoke projectiles (37mm and rifle grenades), grenade fuzes, and illumination signals, were found during this removal activity (Table 4).

A portion of Site OE-16 was investigated as part of the Field Trial Sites phase of the ODDS (*USACE, 2001*). Four 100- by 100-foot grids were investigated within Site OE-16, including the area around the narrow gauge railroad track (Plate 9) (*USACE, 2001*). Several UXO items including, four HEAT rifle grenades, one rifle grenade fuze, and one HE 2.36-inch rocket, as well as hundreds of ordnance scrap items (predominantly practice 2.36-inch rockets) were found and removed (Table 4).

A Time Critical Removal Action (TCRA) was conducted at IA Site OE-16 to remove surface ordnance easily accessible to trespassers. No vegetation was cut for this action. For safety reasons, ordnance crews were limited to accessing areas with little or no vegetation. UXO items found and removed during the TCRA included a high explosive antitank rocket, a practice rocket, antitank missile launching simulators, and an artillery simulator. Two expended practice rockets were also removed.

4.3.4 Conceptual Site Model

This section presents the CSM for Site OE-16. Information regarding the past use of the site is also presented in Section 4.3.1.5. A discussion of the process for developing a CSM and the types of information that are incorporated has been provided in Section 4.1.4. As described earlier, CSMs are developed during preliminary site characterization phases to provide a basis for investigation design and identification of potential release and exposure routes. As described in Section 4.3.3, limited site data has been collected, primarily during fuel break construction and the completion of the ODDS (*USACE, 2001*). Therefore, the CSM for this site is based largely on available information resulting from analysis of literature, aerial photos, maps, technical manuals, range control files, and field observations, and the information shown on Plate 10.

After the completion of the Interim Action at Site OE-16, data collected will be used to further refine the CSM, which will be included in the basewide OE RI/FS. The hazard level would be influenced directly by the type of UXO, the proximity of the UXO to the surface, the

accessibility of the site to the public, and the activities the public may engage in when trespassing onto the site.

4.3.4.1 Site Features

Site OE-16 was identified on historical training facilities maps (circa 1945) as a practice bazooka (2.36-inch rocket) range. Features identified on a 1949 aerial photo include what appears to be six firing points and five targets in a row down range with an additional single target further down range (Plates 8 and 10). Disturbed vegetation patterns forming streaks from the firing points to and beyond the targets indicate that low angle firing and/or vegetation clearance for target visibility occurred in that area. Although maps showing the configuration of range fan(s) and direction of fire are not available, features on the aerial photo and the locations of UXO and ordnance scrap indicate firing was to the north. Evidence at the site shows that both practice and HEAT rockets were used at the site. Practice and HE antitank rifle grenades have also been found at the site and appear to be of the same general period (WWII and Korean War era). However, available information does not indicate in which direction the rifle grenades were fired.

As described in Section 4.3.1.5, post-1946 maps do not indicate a bazooka range in this location. Subsequent uses of the area or portions thereof have included squad tactics, recoilless rifle training, bivouac, and concurrent mortar training. The term "concurrent mortar training" indicates non-firing practice. The recoilless rifle training area indicated on maps from approximately 1964 through 1972 is expected to have been for concurrent training based on conversations with the USACE OE Safety Specialist (the area is too small for live fire) and the lack of UXO/ordnance scrap suggesting live recoilless rifle fire in the area.

It appears that the last use of the area before base closure was as an anti-armor training area (Plate 9). Range control diagrams and aerial photos show numerous obstacles, berms, entanglements, and other mock-battlefield structures designed to train troops in moving in the vicinity of and attacking armored vehicles. Several practice antitank mines have been found on the site, which is consistent with this type of training. A portion of a narrow gauge track approximately 90 feet long is present in the western portion of the site. It appears that the track extended further to the east based on the berm extending beyond the existing track. The track was originally thought to have been part of the bazooka range mentioned above. However, during the recent removal of the tracks, the OE contractor discovered hundreds of buried 2.36-inch practice rockets beneath the tracks, which indicates the tracks were installed after use as a bazooka range and were likely part of the anti-armor training course.

4.3.4.2 Potential Sources and Location of OE/UXO

Available information indicates Site OE-16 had been used for training and live fire exercises with practice and HE rockets and rifle grenades in the 1940s and possibly the early 1950s. The site was later used for a portion of time as an anti-armor training area based on available documentation and the presence of training structures and practice landmines. UXO is known or expected to be distributed throughout the site on the surface and in the subsurface. Other potential sources of OE/UXO could include firing lines and burial pits, which have yet to be evaluated. Documentation regarding the use of the eastern portion of the site is limited, but correspondence and edited maps indicate that numerous rifle grenades may have been found there in the early 1990s.

4.3.4.3 Potential Exposure Routes

Site OE-16 is currently enclosed by a chain link fence and access is restricted to authorized personnel only. Potential exposure to OE/UXO by unauthorized persons has occurred and could occur through intentional trespassing incidents. An Ordnance and Explosives Site Security Program (*Army, 2001b*) to mitigate such

incidents is currently being implemented by the Army. However, the Army has determined that a threat to human health (public safety) or welfare or the environment exists at the site for the following reasons:

- The area within Site OE-16 is known to contain sensitively fuzed, highly dangerous UXO in the form of 2.36-inch rockets and rifle grenades. Because of their light weight and low trajectory, they are expected to be present on the ground surface or predominantly within the uppermost one foot of soil.

- Existing access deterrents such as temporary 6-foot high chain link fencing and a chain link gate posted with warning signs approximately every 500 feet discourage, but do not prevent entry into the site. Trespassers may knowingly or unknowingly come in contact with UXO and cause it to detonate.

- Recent exposures (without injuries) have been documented through instances of unauthorized access by persons, including children, into the adjacent MRA and removal of ordnance scrap. In 2001, an incidence of persons trespassing within the MRA adjacent to Site OE-16 was reported. In addition, five incidences of trespassing into the MRA adjacent to Site OE-16 occurred within the last three years.

- OE workers will have direct contact through physical disturbance of OE/UXO during remedial activities. Trespassers may have contact through intentional disturbance such as removal of an item, or unintentional contact through ground pressure as they walk over the item.

5.0 INTERIM REMEDIAL ACTION OBJECTIVES AND SELECTION OF INTERIM ACTION SITES

This section discusses the Interim Remedial Action Objectives and Interim Action site selection process, and summarizes the site-specific rationale for development of Interim Action Alternatives for the three IA sites: Ranges 43–48, Range 30A, and Site OE-16.

5.1 Interim Remedial Action Objectives

The primary purposes for developing Interim Remedial Action Objectives (RAOs) are to reduce risks to human health and the environment associated with OE. Current risk from OE and cleanup goals related to the Interim Remedial Action Objectives are discussed below.

5.1.1 Current Risk from Ordnance and Explosives

Evaluation of risk from contact with OE cannot be quantitatively estimated based on current information. However, qualitative discussion of overall risk due to OE is valuable in evaluating various OE related factors that lead to adverse human health outcomes. Evaluation of OE risk is best discussed in terms of the likely contact of humans with OE items and the type of OE items. The greater the likelihood of contact, the greater the risk. In general, risks from contact with OE are acute and potentially catastrophic in nature, and may result in crippling injuries or death.

OE-related factors that must be considered in the discussion of OE risk include:

- Size and type of OE (the smaller the item, the more tempting it is to pick it up)
- Type of fuze (some fuzes are more sensitive than others)
- Amount of OE present in an area (the more OE present, the more likely some will be found)
- Accessibility of any area containing OE to human activities (the more easily accessible the area, the more likely people will use it; also the greater the population in close proximity to a site, the more people will use an area).

All three IA sites evaluated under this IA RI/FS are in close proximity to residential areas. Although these sites are fenced to limit access to authorized personnel only, trespassing incidents have been recorded. Many types of OE items have been found at the ranges, but chief among these are highly portable items containing extremely sensitive fuzes, such as 40 mm grenades, bazooka rockets, and various HE projectiles and mortar rounds. Because of the nature of the ordnance used on these ranges, much of it is on the surface and is readily accessible to unauthorized personnel. The surface and shallow subsurface OE items represent the greatest risk.

5.1.2 Cleanup Goals

An Interim Action is a remedial action that can be implemented quickly and that, although not necessarily intended as a final remedial measure at a site, substantially reduces potential immediate, imminent, and/or substantial risks to human health and is consistent with long term goals. The cleanup goals for Interim Action at Ranges 43-48, Range 30A, and Site OE-16 are to take OE Remedial Action at these sites to minimize OE risks.

Remedial activities conducted at the IA sites will be further evaluated under the basewide OE RI/FS to determine adequacy of actions taken and the need for further action, if any. The OE RI/FS will evaluate:

- The effectiveness of the geophysical detection instruments used
- Conceptual site models vs. actual field conditions
- Completeness of IA remedial actions relative to data quality objectives for the OE RI/FS program
- Assessment of any potential residual OE risks
- The need for long-term risk management measures to address any potential residual OE risks.

5.2 Selection of Interim Action Sites

Ranges 43–48, Range 30A, and Site OE-16 were selected for Interim Action based on the site eligibility criteria and rationales presented below.

5.2.1 Site Eligibility Criteria

The site eligibility criteria for Interim Action at these OE areas include the presence of an imminent threat/OE hazard due to:

- The presence of highly dangerous OE (sensitive fuzing and high explosives) on or near ground surface.
- Areas in close proximity to the public. The locations of the Interim Action sites relative to neighboring communities are shown on Plate 2.
- Dense vegetation that obscures the presence of sensitive OE on the ground.
- Existing access deterrents such as barbed-wire fencing, concertina wire, chain link fencing and chain link gates posted with warning signs discourage, but have not prevented entry into these areas.

5.2.1.1 Imminent Threat and OE-Related Hazards

Imminent threats and OE hazards were described in Section 4.0 and are summarized below. In general, these sites are eligible for Interim Action because each of the IA sites contains high explosives on or near ground surface in areas that are near the public and imminent threats from OE present at these sites must be mitigated to protect human health and the environment.

IA remedial activities will be performed in accordance with Title 40, Code of Federal Regulations, Part 300, Section 430 and as described in this report. Title 40, Code of Federal Regulations, Part 300, Section 430 provides in part that at any release, regardless of whether the site is included on the National Priorities List, the lead agency (the Army) may take any appropriate action to abate, prevent, minimize, stabilize, mitigate, or eliminate the release or the threat of release [Subsection (b)(1)].

5.3 Rationale

The following sections summarize the site-specific rationale for conducting Interim Action at each of the IA sites. In general, each of the IA sites contains high explosives on or near ground surface in areas that are near the public and potential access to OE at these areas must be mitigated to protect human health and the environment.

5.3.1 Ranges 43–48

The rationale for conducting an Interim Action at Ranges 43–48 is that highly dangerous OE is present in ranges that are adjacent to residential areas and schools with heavy vegetative cover that obscures the presence of OE as summarized below.

- **Population, Proximity, and Access:** This IA site is adjacent to residential neighborhoods on the former Fort Ord (Fitch and Marshall Park) and near the City of

Seaside. The Fitch and Martin Luther King Jr. Middle Schools are located less than a mile from Ranges 43-48. These ranges were part of the Fort Ord MRA and are categorized as firing ranges where personnel were trained in the use of live OE. The MRA is fenced and posted with signs warning of the dangers associated with unexploded ordnance. Existing access deterrents such as barbed-wire fencing, concertina wire, and chain link gates posted with warning signs discourage, but do not prevent entry into the ranges. Several instances of unauthorized access by persons into the Range 43-48 IA site have been documented.

- **Vegetation Status:** Over the majority of the ranges, vegetation is often densely knitted together, and the composition, texture, thickness, and resistance of the vegetation vary by species, community composition, and area. In some areas the vegetation is a dense knit of small but stiff stems; in other areas the shrubs are dominated by large stems with a canopy of leaves held well above the ground. In general, dense vegetation at the ranges obscures the presence of OE on the ground surface in these areas and may even contain OE in aboveground branches and brush.

- **Presence and Type of OE:** Areas in and around the former firing ranges contain large quantities of sensitively fuzed, highly dangerous UXO such as 40mm, 57mm, 60mm mortar, 66mm, 81mm mortar, and 84mm HE and HEAT projectiles, and dragon guided missiles present on the ground surface or predominantly suspected to occur within the uppermost one foot of soil.

5.3.2 Range 30A

The rationale for conducting an Interim Action at Range 30A is that highly dangerous OE is present in areas at the ranges that are adjacent to residential areas with heavy vegetative cover that obscures the presence of OE as summarized below.

- **Population, Proximity, and Access:** The Range 30A IA site is located in close proximity (approximately 2,200 feet north) to the Laguna Seca residential area, the Laguna Seca Golf Course and less than a mile from the Laguna Seca Raceway. South Boundary Road, located approximately 2,000 feet to the south, is open to vehicular traffic during events at Laguna Seca Raceway and is always open to the public for jogging, hiking, and biking. Range 30A is part of the Fort Ord MRA. The MRA is fenced and posted with signs warning of the dangers associated with unexploded ordnance. Existing access deterrents such as four-strand barbed-wire fencing, concertina wire, and chain link gates posted with warning signs discourage, but do not prevent entry into the area. Instances of unauthorized access by persons including children into the MRA have been documented.

- **Vegetation Status:** Over the majority of the range, vegetation is often densely knitted together, and the composition, texture, thickness, and resistance of the vegetation vary by species, community composition, and area. In some areas the vegetation is a dense knit of small but stiff stems; in other areas the shrubs are dominated by large stems with a canopy of leaves held well above the ground. In general, dense vegetation at Range 30A obscures the presence of OE on the ground surface in these areas and may even contain OE in aboveground branches and brush.

- **Presence and Type of OE:** Range 30A was used for live fire exercises from 1990 to 1993. Available information indicates the range was used for training with the MK19 machine gun, which fired 40mm TP, HE, and High Explosive Dual Purpose (HEDP) projectiles. Highly dangerous UXO is known or expected to be distributed throughout the range on the surface and in

the subsurface. Other potential sources of OE/UXO could include firing lines and burial pits, which have yet to be evaluated. Adjacent Ranges 28, 29, and 30 likely contain UXO in the form of undetonated practice rounds such as the subcaliber LAW items mentioned above, which contain spotting charges. Based on available records, no high explosive ammunition was authorized on Ranges 28, 29, and 30. However, because of the variety of historical range use at former Fort Ord, the presence of other UXO items in these ranges cannot be discounted.

5.3.3 Site OE-16

The rationale for conducting an Interim Action at Site OE-16 is that highly dangerous OE is present in areas at the site that are adjacent to residential areas with heavy vegetative cover that obscures the presence of OE as summarized below.

- **Population, Proximity, and Access:** Site OE-16 is located adjacent to the MRA and land that has been transferred to the BLM. The BLM land is open to the public for hiking, biking, jogging, and horseback riding. IA Site OE-16 is surrounded by a temporary 6-foot high chain linked fence posted with signs warning of the dangers associated with UXO. The area is in close proximity to a residential neighborhood (Fitch Park) on the former Fort Ord. Existing access deterrents such as temporary 6-foot high chain link fencing and chain link gates posted with warning signs discourage, but do not prevent entry into the area. Several instances of unauthorized access by persons into the adjacent MRA have been documented.

- **Vegetation Status:** Over the majority of the site, vegetation is often densely knitted together, and the composition, texture, thickness, and resistance of the vegetation vary by species, community composition, and area. In some areas the vegetation is a dense knit of small but stiff stems; in other areas the shrubs are dominated by large stems with a canopy of leaves held well above the ground. In general, dense vegetation at Site OE-16 obscures the presence of OE on the ground surface in these areas and may even contain OE in aboveground branches and brush.

- **Presence and Type of OE:** Available information indicates that Site OE-16 had been used for training and live fire exercises from approximately the 1940s until the time the base was officially closed in 1994. The site was used for a portion of the time as an anti-armor training area based on available documentation and the presence of numerous whole and partial 2.36-inch rockets, antitank rifle grenades, and abundant fragmentation on the ground surface. Evidence from the site indicates that both practice and HEAT rounds were used. UXO is known or expected to be distributed throughout the site on the surface and in the subsurface. Other potential sources of OE/UXO include firing lines and burial pits, which have yet to be evaluated.

6.0 INTERIM ACTION FEASIBILITY STUDY

This section presents the Interim Action Feasibility Study for the IA sites at Fort Ord, including:

- Section 6.1 – Development and Screening of Interim Action Alternatives
- Section 6.2 – Applicable or Relevant and Appropriate Requirements (ARARs)
- Section 6.3 – Evaluation and Comparison of the Interim Action Alternatives.

As outlined in EPA guidance for Interim Action RI/FSs (*EPA, 1988*) and specified in the National Contingency Plan for CERCLA sites, the development and screening of remedial alternatives is performed in this section based on the nine EPA evaluation criteria described below. Based on the results of the screening, the alternatives are retained or eliminated from further consideration in Section 6.1; ARARs for the retained alternatives are described in Section 6.2; and a more detailed analysis and comparison of the alternatives based on the evaluation criteria is presented in Section 6.3. Section 7.0 presents the selection of the Preliminarily Identified Preferred Interim Action Alternatives for each of the IA sites based on the evaluation, comparison, and ARARs analysis; Section 8.0 summarizes the approval process for the IA sites. The Preferred Interim Action Alternatives for each of the IA sites will be selected and documented in the ROD.In order to perform comprehensive OE-related actions at these sites, a three-tiered approach to developing Interim Action Alternatives for the three different components of the actions must be considered. Interim Action Alternatives for each of the three IA sites will include the following components:

- **Vegetation Clearance Alternatives** address site preparation procedures to clear vegetation to bare ground or approximately 6 inches above ground surface to allow for proper operation of UXO detection equipment and to provide the required ground surface visibility for the safety of OE workers at the IA sites.
- **OE Remedial Action Alternatives** address remedial procedures to mitigate threats associated with the presence of OE at the IA sites.
- **OE Detonation Alternatives** address detonation procedures in areas where UXO is identified during remedial activities at the IA sites.

Descriptions and applicable methods for carrying out each of these alternatives at the IA sites are described in the following section. In addition, this section presents the development of site-specific three-tiered Interim Action Alternatives for each of the IA sites, which are then subjected to an analysis of ARARs in Section 6.2 and evaluated and compared in Section 6.3 based on the CERCLA criteria of effectiveness, implementability, and cost.

6.1 Development and Screening of Interim Action Alternatives

The three-tiered Vegetation Clearance, OE Remedial Action, and OE Detonation Alternatives are described below and screened for applicability based on general site conditions at the IA sites and their ability to achieve the EPA evaluation criteria described below.

The screening and evaluation of alternatives are based on the nine criteria specified in the U.S. Environmental Protection Agency's (EPA) *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (*EPA, 1988*) (RI/FS Guidance). These nine criteria are:

1. Overall Protection of Human Health and the Environment
2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) (see Section 6.2 and Table 5)
3. Long-Term Effectiveness and Permanence
4. Reduction of Toxicity, Mobility, or Volume Through Treatment
5. Short-Term Effectiveness
6. Implementability
7. Cost
8. State Acceptance
9. Community Acceptance.

These criteria for remedial action are addressed below in a parallel format for vegetation clearance.

6.1.1 Vegetation Clearance Alternatives

A range of vegetation clearance methods identified as potentially applicable for clearing vegetation at the IA sites are described and evaluated in Appendix A (Screening Evaluation of Vegetation Clearance Methods), which provides a screening and evaluation of vegetation clearance methods. The methods evaluated include: (1) No Action, (2) Manual and Mechanical Clearing, (3) Prescribed Burning (with and without pre-treatment by herbicide application or crushing), (4) Animal Grazing, and (5) Herbicide Application. Based on the screening and evaluation of vegetation clearance methods presented in Appendix A, the following methods were retained for further consideration for all three IA sites:

- No Action
- Prescribed Burning
- Mechanical Methods
- Manual Methods.

This section presents a summary of the three vegetation clearance methods listed above, which were retained for further consideration as Vegetation Clearance Alternatives herein.

6.1.1.1 No Action

The No Action Alternative is provided, as required under CERCLA and the National Contingency Plan (NCP), as a baseline for comparison to the other proposed alternatives. This alternative assumes no action would be taken to clear vegetation prior to remedial activities. There are no capital or operation and maintenance costs associated with the No Action Alternative.

6.1.1.2 Prescribed Burning

Prescribed burning is the use of fire under a specific set of conditions to burn vegetation. Prescribed burning is used in a large number of plant communities in California to achieve a range of objectives. Most commonly, the objectives for which a prescription is developed are one or more of the following: fuel hazard reduction and control; range improvement; agricultural land clearing; commercial forest stand improvements; slash reduction or removal (tree cutting operations); and habitat maintenance or enhancement.

The following parameters would be associated with conducting prescribed burning for purposes of vegetation clearance.

Impacts to the Public

Conducting a prescribed burn within the IA sites is not expected to have adverse impacts on the public because it would include informing and offering support to affected residents and coordinating relocation efforts during and for a period after the burn. Prior to the burn, Army personnel will coordinate relocation efforts and ensure the public is informed of the planned burn through a notice in a local newspaper, public meetings, and other avenues of

communication as appropriate. The prescribed burn would be conducted under optimal climatic conditions to minimize smoke and control the burn within the IA sites. After the burn was completed, air monitoring would continue until after the smoke had cleared and the return of relocated residents would be coordinated. Smoke would be generated for approximately two days during each of the three burns at the three IA sites and residual smoke from burning may remain in the air for several days thereafter.

Burns may have impacts on the public under most meteorological conditions, however, development of the burn prescription would include assessment of meteorological conditions and design of the prescription to minimize potential impacts to the public. Relocation of individuals during the burn to minimize risks would have an impact on the public in terms of the inconvenience involved. Prior public notification, smoke management while conducting the burn, and temporary relocation of individuals from areas affected by smoke to unaffected areas would minimize potential impacts of the emissions.

An assessment of OE-related air emissions that may be associated with conducting a burn was conducted in the Air Emissions Technical Memorandum (see "Air Emissions" subheading below), which indicated air pollutant emissions from incidental OE detonation during a prescribed burn in Ranges 43 through 48 (also applicable to burning of CMC habitat at the other IA sites) would be minor compared to emissions contributed directly by biomass burning, and would result in pollutant concentrations well below health-protective regulatory screening levels..

The possibility exists for any vegetation clearance method applied at the IA sites to detonate UXO. Mitigation of potential public exposure to flying fragments or blast debris from accidental detonation of UXO during vegetation clearance activities would be addressed in the site health and safety plan for individual areas. In addition, a community safety plan would be provided to present information regarding accidental and intentional detonation of UXO. In general, potential public exposure would be prevented by: (1) conducting a pre-field analysis of the type, size, and orientation of the UXO known or expected to be present in a given area and its proximity to the public,
(2) calculation of the maximum distance flying fragments or blast debris would travel based on the type and size of UXO, and
(3) implementation of mitigation measures if necessary to prevent public exposure. Potential emissions from detonated UXO are expected to be insignificant and not of concern in terms of human health.

How the Method is Carried Out in the Field

The major elements of prescribed burning for purposes of vegetation clearance include the following:

- Preparation of a burn prescription/burn plan outlining the objectives of the burn, the burn area, and the range of environmental conditions (temperature, humidity, wind speed/direction, fuel load, and fuel moisture) under which the burn will be conducted. The burn plan also describes the manpower and equipment resources required to ignite, manage, and contain the fire, and establishes the communication procedures for the fire crew and to the public and other affected agencies.

- Site preparation, including establishment and maintenance of primary, secondary, and tertiary containment lines, staging areas, and escape routes.

- Conducting the burn within the window of environmental conditions established in the burn prescription.

- Follow-up operations to ensure that the fire is fully contained and does not escape the perimeter of the burn area.

Worker Exposure to UXO

Burning of vegetation would be conducted using aerial methods (e.g., via helicopter), which would isolate workers from direct exposure to UXO that is potentially present in areas being cleared. Although some ground crews would be present in fuel break areas and air sampling or meteorological stations will be placed in areas that have been previously cleared of UXO, proper worker awareness, protective equipment, and care would reduce worker exposure to injury.

Accidental Detonation of UXO

In the case of accidental detonation of UXO, prescribed burn workers would not be likely to be exposed to flying fragments or blast debris depending on distance to and the type and size of the UXO. In general, the possibility exists for any vegetation clearance method applied at the IA sites to detonate UXO. The burn would be conducted by personnel located outside the burn area containing UXO, which would minimize exposure. Mitigation of potential public exposure to flying fragments or blast debris from accidental detonation of UXO during vegetation clearance activities would be addressed in the site health and safety plan for individual areas. In addition, a community safety plan would be provided to present information regarding accidental and intentional detonation of UXO.

In general, potential public exposure would be prevented by: (1) conducting a pre-field analysis of the type, size, and orientation of the UXO known or expected to be present in a given area and its proximity to the public, (2) calculation of the maximum distance flying fragments or blast debris would travel based on the type and size of UXO, and (3) implementation of mitigation measures if necessary to prevent public exposure.

Duration of the Vegetation Clearance Method

For a typical IA site, vegetation clearance using prescribed burning would include preparing and relocating affected residents, conducting the burn, and allowing the smoke to clear and continuation of air sampling and monitoring.

Air Emissions

Smoke would be generated for two days during the burn and residual smoke from burning may remain in the air for several days thereafter. However, prior public notification, smoke management while conducting the burn, and temporary relocation of individuals from areas affected by smoke to unaffected areas would minimize potential impacts of the emissions. Potential emissions from detonated UXO are expected to be insignificant and not of concern in terms of human health, the environment, and worker safety. The Army conducted an assessment of OE-related air emissions that may be associated with conducting a burn. The results are presented in the Technical Memorandum, Air Emissions from Incidental Ordnance Detonation During a Prescribed Burn on Ranges 43 through 48, Former Fort Ord (*Harding ESE, 2001c*) (Air Emissions Technical Memorandum) prepared in cooperation with and under review by the regulatory agencies.

The intense fire associated with prescribed burn conditions may result in the detonation of surface or near-surface OE items. Detonation of OE has the potential to release air pollutants to the atmosphere. These air emissions may potentially include combustion products, volatile or semivolatile organic compounds, unburned or incompletely burned energetic material, and particulate metals and metal compounds from chemical components of the OE items. At issue is whether the type or quantity of air emissions from incidental detonation of OE in Ranges 43-48 is significant in comparison to air emissions from prescribed burning of vegetation (biomass) in the same area, or is significant in absolute magnitude.

A Technical Memorandum, Air Emissions from Incidental Ordnance Detonation During a Prescribed Burn on Ranges 43-48, Former Fort Ord (*Harding ESE, 2001c*) (Air Emissions Technical Memorandum) was prepared to (1) quantify a reasonable upper bound estimate

of air emissions from incidental detonation of OE in Ranges 43-48, (2) compare those emissions with those expected from burning of biomass, and (3) compare screening level estimates of pollutant concentrations from OE to health-protective regulatory screening values. Data from this investigation may also be used to guide the development of an appropriate ambient air monitoring program to be implemented during a prescribed burn at Ranges 43-48 if such a prescribed burn is performed. The Air Emissions Technical Memorandum does not address the issue of possible human health effects from biomass burning.

The results of this investigation reveal that reasonable upper bound estimates of air emissions from incidental OE detonation for combustion products and volatile organic compounds are much less than 0.1 percent (i.e., one one-thousandth) of the corresponding emissions from biomass burning in Ranges 43-48. The only exception is for dioxin/furan toxicity equivalent emissions for which the reasonable upper bound OE contribution is about 1percent (i.e., one one-hundredth) of that from biomass. Reasonable upper bound emissions of all particulate metals except Beryllium from incidental OE detonation are equal to or less than 10% (i.e., one-tenth) those from biomass burning. For all pollutants evaluated in this investigation, including Beryllium and those pollutants for which there are no corresponding biomass emissions for comparison, screening model estimates of pollutant concentrations are much less than health-protective regulatory screening values.

The conclusion of this investigation is that air pollutant emissions from incidental OE detonation during a prescribed burn in Ranges 43-48 will be minor compared to emissions contributed directly by biomass burning, and will result in pollutant concentrations well below health-protective regulatory screening levels.

Erosion

Vegetation clearance using prescribed burning may result in some surface disturbance or erosion on slopes in the short term, since fire reduces most of the vegetation to bare mineral soil. However, revegetation of burned areas is likely to proceed rapidly following the start of the next rain season, thus minimizing further erosion potential. In the long term, burning would have a beneficial impact on the health and growth of the plants and their stability.

Impacts to Protected and Other Natural Resources

Burning would have beneficial impacts on rare, threatened and endangered plants present at the IA sites in the long term because chaparral communities in California are adapted to periodic wildfires and the CMC habitat present at the IA sites has evolved to be dependent on fire for its health and functioning. Vegetation that is cleared by burning not only recovers, but flourishes and provides an opportunity for a greater diversity of native plants to grow. Plants and animals at the IA sites have survived, become dependent on, and adapted to a cycle of occasional fire that recycles nutrients and exposes minerals in the soil while stimulating the germination of seeds that accumulate in between fires. This natural succession allows the plant community to rejuvenate itself and enhances the natural diversity of the unique habitat containing rare, threatened and endangered plants at the IA sites. Preliminary observations made during monitoring of habitat recovery after vegetation clearance at Fort Ord (conducted under the HMP monitoring program) support burning as a favorable method for vegetation clearance for the following reasons:

- Seedlings of HMP shrubs were common in burned areas after clearance activities. A preliminary evaluation indicated HMP shrub regeneration occurred in densities over 3,000 seedlings per acre after burning (as compared to only 29 seedlings per acre occurred after cutting).

- Species diversity is generally higher in burned areas.

- More native herbaceous species were observed in burned areas.

In addition, because CMC habitat contains protected species at the IA sites, resource management measures are required by the USFWS as detailed in the Biological and Conference Opinion (BO), memoranda, and other correspondence between USFWS and the Army (*USFWS, 1993, 1997 2001*; *Army, 1998b; 2000*) and in accordance with the HMP (*USACE, 1997*). The intent of the USFWS is that "the Army would primarily use prescribed fire to clear vegetation in support of OE removal actions in areas designated as habitat reserves [and] . . . to preserve, protect, and enhance populations and habitat of listed species and to protect candidate and sensitive species to the extent needed to preclude the need for future listings. Consequently, methods of vegetation clearance in maritime chaparral that do not involve burning are not consistent with the habitat and species preservation and protection goals of the HMP" (*USFWS, 2001*).

There is a risk of escaped fires or wildfires involved in burning vegetation. In 1997, a prescribed burn intended to clear 100 acres jumped the fuel break and spread, burning a total of approximately 400 acres. The intended 100 acres was located between BLM Trails 16 and 103, to the East of Henneken's Ranch Road. The Fire jumped Trail 103 and spread Southeast. The fire's extent spread South to Crescent Bluff Road and East to BLM Trail 22. However, as summarized under the subheading below (Use at Fort Ord or Other Sites and Under What Conditions), many prescribed burns have been successfully conducted without escaping.

Prior to the burn, Army personnel will coordinate relocation efforts and ensure the public is informed of the planned burn through a notice in a local newspaper, public meetings, and other avenues of communication as appropriate. In addition, vegetation and UXO clearance personnel would maintain and prepare fuel breaks surrounding the burn area and forming a containment line. The breaks would be pre-treated immediately before conducting the burn with a fire suppressant foam. In addition, meteorological profiling would be conducted prior to and during the burn. Prescribed burning would be conducted using an operator to pilot the helicopter equipped with a torch to initiate the burn, and several people located at high elevations outside the burn area observing the burn's progress telescopically. A coordination crew of several people would also be involved in planning and monitoring the burn and assessing meteorological conditions and air samples would be collected and analyzed offsite. Fire suppressant crews would stand by during the burn and emergency fire crews from local jurisdictions would be on notice in case the fire traveled in an unplanned manner.

Use at Fort Ord or Other Sites and Under What Conditions

Prescribed burning has been used extensively at former Fort Ord for decades because of military training activities, and has also been used to clear CMC vegetation from OE sites similar to the IA sites to support removal actions at the former Fort Ord since 1994. Prescribed burns are conducted in close coordination with federal, state, and local regulatory agencies. Prescribed burns consist of using fire under optimal climatic conditions to clear vegetation from OE Sites, and is the primary vegetation clearance method for extensive use in designated HMP CMC habitat that exists at the IA sites.

Prescribed burns from 1994 – 1998 resulted in one escape in 1997. An escape is defined as fire outside the control lines that is unmanageable with onsite resources. The Army had originally planned to burn 100 acres. However, this fire resulted in 400 acres being burned. The following table summarizes prescribed burns conducted at Fort Ord.

Year	Acres Burned	OE Site
1994	100	OE-5, OE-47
1995	140	OE 10A, OE-19
1996	0*	N/A
1997	400	OE-10B
1998	215	OE-10A, OE-44

* No burning was conducted in 1996 because vegetation clearance activities were not required.

Availability of Equipment and Personnel

Prescribed burning has been used extensively at the former Fort Ord and the equipment and personnel necessary to implement burning would be available for use at the IA sites under the stringent time constraints associated with a high priority OE Remedial Action.

Deposition of Vegetation

Depending on the provisions of the burn prescription and the occurrence of suitable conditions, the burn would clear or consume the majority of top growth on shrubs, consume the leaf litter, and burn a portion of the standing woody stems. The extent to which woody material would be consumed is directly related to fuel moisture and ambient conditions at the time of the burn. Under relatively cool, moist conditions, very little woody material would be consumed. Under low-humidity, low-fuel moisture conditions, woody vegetation up to 2 inches in diameter may burn.

Visibility of Ground Surface

Safety procedures require the vegetation be cleared to bare ground or approximately 6 inches above ground surface to allow for proper operation of UXO detection equipment and prevent the accidental detonation of UXO on the surface. This level of clearance would be achievable using burning. Fire clears the vegetation and leaves the range in a condition that typically provides OE workers with a clear, unobstructed view of the ground surface.

Regrowth of Vegetation and Maintenance Requirements

Prescribed burning would consume the majority of the vegetation; however, additional cutting may be necessary in certain areas to achieve clearance to bare ground or approximately 6 inches above ground surface depending on the fire conditions. Such additional cutting may only occur after a surface clearance of UXO has been conducted. Protocols for the long-term maintenance of burned areas have been established in the HMP and include five years of monitoring the recovery of the vegetation.

Level of Effort in Terms of Personnel

Prior to the burn, Army personnel will coordinate relocation efforts and ensure the public is informed of the planned burn through a notice in a local newspaper, public meetings, and other avenues of communication as appropriate. In addition, vegetation and OE workers would clear and maintain fuel breaks surrounding the burn area and form a containment line. The breaks would be pre-treated immediately before conducting the burn with a fire suppressant foam. An air sampling and monitoring program would be developed and coordinated by air quality personnel, and air monitoring stations would be set up. In addition, meteorological profiling would be conducted prior to and during the burn. Prescribed burning would be conducted using an operator to pilot the helicopter equipped with a torch to initiate the burn, and personnel would be located at high elevations outside the burn area observing the burn's progress telescopically. A coordination crew would also be involved in planning and monitoring the burn and assessing meteorological conditions. Air samples would be collected and analyzed offsite. Fire suppressant crews would stand by during the burn and emergency fire crews from local jurisdictions would be on notice in case the fire traveled in an unplanned direction. After the burn was completed, air monitoring would continue until after the smoke had cleared and the return of relocated residents would be coordinated.

6.1.1.3 Mechanical Methods

Mechanical clearing is conducted by an operator situated on self-propelled equipment in the work area being cleared. An example would be a worker operating a tractor from inside the cab.

Impacts to the Public

Operation of heavy equipment within the IA sites during mechanical vegetation clearance activities is not expected to have impacts on the public. However, the possibility exists for any vegetation clearance method applied at the IA sites to detonate UXO. Mitigation of potential public exposure to flying fragments or blast debris from accidental detonation of UXO during vegetation clearance activities would be addressed in the site health and safety plan for individual areas. In addition, a community safety plan would be provided to present information regarding accidental and intentional detonation of UXO. In general, potential public exposure would be prevented by: (1) conducting a pre-field analysis of the type, size, and orientation of the UXO known or expected to be present in a given area and its proximity to the public, (2) calculation of the maximum distance flying fragments or blast debris would travel based on the type and size of UXO, and (3) implementation of mitigation measures if necessary to prevent public exposure. Potential emissions from detonated UXO are expected to be insignificant and not of concern in terms of human health.

How the Method is Carried Out in the Field

This method consists of using human-operated equipment in three basic configurations to cut vegetation: tractor-pulled, track-carriers with booms, and skid-steer. These types of equipment are designated by product names such as the Brush Hog, Hydro-Ax, TAZ, and Brontosauraus and are described below. Equipment operators maneuver the equipment onto the OE sites to clear the vegetation.

Worker Exposure to UXO

Mechanically cutting vegetation would expose workers to UXO that is potentially present in areas being cleared. If accidentally detonated, undetected UXO could cause serious injury or death. Although the machinery being operated could potentially separate the workers from direct contact with UXO and proper worker awareness, protective equipment, and care could reduce worker exposure to injury, the type of UXO present at the IA sites is extremely sensitive and, in some cases, is from the HEAT armor piercing ammunition class, which is designed to destroy any heavy equipment that may be present.

Accidental Detonation of UXO

In the case of accidental detonation of UXO, mechanical cutting would directly expose the equipment operator or other workers to flying fragments or blast debris depending on distance to and the type and size of the UXO. In general, the possibility exists for any vegetation clearance method applied at the IA sites to detonate UXO. Mechanical cutting has a high likelihood of causing serious injury or death of workers because they would only be separated from direct contact by components of the heavy equipment. Some types of UXO, such as high explosive antitank armor piercing ammunition, is designed specifically to destroy heavy equipment.

Mitigation of potential public exposure to flying fragments or blast debris from accidental detonation of UXO during vegetation clearance activities will be addressed in the site health and safety plan for individual areas. In addition, a community safety plan would be provided to present information regarding accidental and intentional detonation of UXO. In general, potential public exposure would be prevented by: (1) conducting a pre-field analysis of the type, size, and orientation of the UXO known or expected to be present in a given area and its proximity to the public, (2) calculation of the maximum distance flying fragments or blast debris would travel based on the type and size of

UXO, and (3) implementation of mitigation measures if necessary to prevent public exposure.

Duration of the Vegetation Clearance Method

Mechanical vegetation clearance of the large amount of acreage present at each of the IA sites, even using numerous crews, would be difficult to implement in a timely manner to coincide with the intention of clearing vegetation as soon as possible to prepare the IA sites for OE Remedial Action. In addition, two passes (one pass to clear to 2 feet and a second pass to clear to bare ground or approximately 6 inches above ground surface), would be required in most circumstances, which would double the potential for exposure of workers to OE.

Air Emissions

Potential emissions from mechanically operated equipment or accidentally detonated UXO are believed to be insignificant and not of concern in terms of human health, the environment, and worker safety.

Erosion

Mechanical vegetation clearance has the potential to cause surface disturbance and erosion in the short term due to cutting equipment scalping the surface and equipment tires or tracks that could create ruts that lead to erosion. Mechanically cutting vegetation could also cause erosion in the long term because it has a severe impact on the health and growth of the plants and their stability.

Impacts to Protected and Other Natural Resources

Cutting would have impacts on rare, threatened and endangered plants present at the IA sites during and after implementation. Cutting would not be protective of the environment in terms of the health and functioning of the habitat containing rare, threatened or endangered species. Preliminary observations made during monitoring of habitat recovery after vegetation clearance at Fort Ord (conducted under the HMP monitoring program) indicate the following:

- Seedlings of HMP shrubs were rarely seen in cut areas after clearance activities. A preliminary evaluation indicated HMP shrub regeneration of only 29 seedlings per acre occurred after cutting (as compared to 3,000 seedlings per acre after burning).
- Species diversity is generally lower in cut areas.
- Fewer native herbaceous species were observed in cut areas.
- Cutting and placing cut vegetation in windrows and mulch piles on the ground surface appears to interfere with chaparral revegetation by occupying habitat and shading the understory and reducing germination by shrub and herbaceous species.

In addition, some mechanical methods cause damage to the soil topography by creating ruts and increasing the threat of erosion. If CMC vegetation is cleared by cutting, it likely will not grow back as diversely or as healthily and may result in converting CMC habitat to a more common habitat type. In addition, because CMC habitat contains protected species at the IA sites, resource management measures are required by the USFWS. Implementation of cutting in areas greater than 50 acres in size would not be consistent with the Biological and Conference Opinion (*USFWS, 1993, 1997)* issued by USFWS in accordance with the Endangered Species Act.

Use at Fort Ord or Other Sites and Under What Conditions

Mechanical vegetation clearance has been used extensively at the former Fort Ord in development areas and on a limited basis where burning cannot be conducted. Mechanical vegetation clearance was used previously in limited portions of the IA sites behind the firing lines, to support OE investigation. Two

mechanized methods that have been used at Fort Ord include the Brush Hog and TAZ. Vegetation would be trimmed only to the extent necessary to allow safe access for sweep teams.

Availability of Equipment and Personnel

Equipment necessary for mechanical cutting may be readily available; however, the large acreage present at each of the IA sites would require mobilization and long-term operations and maintenance of numerous crews to clear the IA sites of vegetation.

Deposition of Vegetation

Vegetation that is cut, chipped or shredded would fall onto the ground, covering UXO and reducing visibility. Recovery of many rare, threatened, or endangered species could be inhibited by a thick layer of woody cuttings, thus inhibiting germination.

Visibility of Ground Surface

Safety procedures require the vegetation be cleared to bare ground or approximately 6 inches above ground surface to allow for proper operation of UXO detection equipment and to prevent the accidental detonation of UXO on the surface. This level of clearance may be achievable using mechanical methods; however, the cuttings generally fall to the ground where they could obscure or cover UXO.

Regrowth of Vegetation and Maintenance Requirements

Vegetation cleared by mechanical methods would not likely require additional cutting if each area has an OE Remedial Action immediately following vegetation clearance; however, standards for long-term maintenance of mechanically cleared vegetation are not known and have not been established. Recovery of vegetation would be inhibited because the ground would be covered, thus preventing germination of rare, threatened or endangered species.

Level of Effort in Terms of Personnel

Mechanical clearance would require coordination of numerous labor crews and UXO specialists working with vegetation clearance teams.

6.1.1.4 Manual Methods

Manual clearing is conducted by an operator who is on foot and in the work area being cleared while operating the equipment. Examples would be a worker using pruning shears or a handheld trimmer fitted with a brush blade.

Impacts to the Public

Operation of manual equipment within the IA sites during mechanical vegetation clearance activities is not expected to have impacts on the public. However, the possibility exists for any vegetation clearance method applied at the IA sites to detonate UXO. Mitigation of potential public exposure to flying fragments or blast debris from accidental detonation of UXO during vegetation clearance activities would be addressed in the site health and safety plan for individual areas. In addition, a community safety plan would be provided to present information regarding accidental and intentional detonation of UXO. In general, potential public exposure would be prevented by: (1) conducting a pre-field analysis of the type, size, and orientation of the UXO known or expected to be present in a given area and its proximity to the public, (2) calculation of the maximum distance flying fragments or blast debris would travel based on the type and size of UXO, and (3) implementation of mitigation measures if necessary to prevent public exposure. Potential emissions from detonated UXO are expected to be insignificant and not of concern in terms of human health.

How the Method is Carried Out in the Field

This method involves cutting and clearing of vegetation using motorized chainsaws, power chippers, mowers, weed eaters, and non-

motorized hand tools such as clippers and loppers. Small diameter or short shrubs could be cut and hand-carried to a staging or stockpiling area for chipping or disposal. Large diameter shrubs and trees could be "limbed up" to allow access under the canopy by OE workers. This method is effective at selectively removing vegetation.

Worker Exposure to UXO

Manually cutting vegetation would expose workers to UXO that is present in areas being cleared, which if accidentally detonated, could cause serious injury or death. Proper worker awareness, protective equipment, and care could reduce worker exposure to injury. The type of UXO present at the IA sites is extremely sensitive and highly dangerous, and could potentially be suspended in the branches of the vegetation being cleared, where it could cause serious injury or death to workers.

Accidental Detonation of UXO

In the case of accidental detonation of UXO, manual cutting would expose workers to flying fragments or blast debris depending on the distance to and the type and size of the UXO. In general, the possibility exists for any vegetation clearance method applied at the IA sites to detonate UXO. Manual cutting has a high likelihood of causing serious injury or death of workers.

Mitigation of potential public exposure to flying fragments or blast debris from accidental detonation of UXO during vegetation clearance activities would be addressed in the site health and safety plan for individual areas. In addition, a community safety plan would be provided to present information regarding accidental and intentional detonation of UXO. In general, potential public exposure would be prevented by: (1) conducting a pre-field analysis of the type, size, and orientation of the UXO known or expected to be present in a given area and its proximity to the public, (2) calculation of the maximum distance flying fragments or blast debris would travel based on the type and size of UXO, and (3) implementation of mitigation measures if necessary to prevent public exposure.

Duration of the Vegetation Clearance Method

Manual vegetation clearance of the large amount of acreage present at each of the IA sites, even using numerous crews, would be difficult to implement in a timely manner to coincide with the intention of clearing vegetation as soon as possible to prepare the IA sites for OE Remedial Action.

Air Emissions

Air emissions from manual clearing and potential emissions from accidentally detonated UXO are believed to be insignificant and not of concern in terms of human health, the environment, and worker safety.

Erosion

Manual vegetation clearance could be used on slopes where equipment access is not possible. Manual clearance would cause a minimum of surface disturbance in the short term and would remove only plant material that interferes with visibility and access; however, cutting vegetation could cause erosion in the long term because it has a severe impact on the health and growth of the plants and their stability.

Impacts to Protected and Other Natural Resources

Cutting would have impacts on rare, threatened and endangered plants present at the IA sites during and after implementation. If CMC vegetation is cleared by cutting, it likely will not grow back as diversely or as healthily and may result in converting CMC habitat to a more common habitat type. Cutting would not be protective of the environment in terms of the health and functioning of the habitat containing rare, threatened and endangered species. Preliminary observations made during monitoring of habitat recovery after vegetation clearance at Fort Ord (conducted under the HMP monitoring program) indicate the following:

- Seedlings of HMP shrubs were rarely seen in cut areas after clearance activities. A preliminary evaluation indicated HMP shrub regeneration of only 29 seedlings per acre occurred after cutting (as compared to 3,000 seedlings per acre after burning).
- Species diversity is generally lower in cut areas.
- Fewer native herbaceous species were observed in cut areas.
- Cutting and placing cut vegetation in windrows and mulch piles on the ground surface appears to interfere with chaparral revegetation by occupying habitat and shading the understory and reducing germination by shrub and herbaceous species.

In addition, because CMC habitat contains protected species at the IA sites, resource management measures are required by the USFWS. Implementation of cutting in areas greater than 50 acres in size would not be consistent with the Biological and Conference Opinion (*USFWS, 1993, 1997*) issued by USFWS in accordance with the Endangered Species Act.

Use at Fort Ord or Other Sites and Under What Conditions

Manual vegetation clearance has been used extensively in development areas and on a limited basis at the former Fort Ord under special circumstances where burns cannot be conducted or terrain is extremely steep. OE contractors typically use a manual brush clearance team consisting of a UXO supervisor and several laborers. Vegetation would be trimmed only to the extent necessary to allow safe access for sweep teams.

Availability of Equipment and Personnel

Equipment necessary for manual cutting may be available; however, the large acreage present at each of the IA sites would require mobilization and long-term operations and maintenance of numerous crews to clear the IA sites of vegetation.

Deposition of Vegetation

Vegetation that is cut would typically be hauled to a staging area onsite where it would be chipped or shredded, which would require these areas first be cleared of vegetation and UXO. Recovery of many rare, threatened, or endangered species could be inhibited by a thick layer of woody cuttings, thus inhibiting germination.

Visibility of Ground Surface

Safety procedures require the vegetation be cleared to bare ground or approximately 6 inches above ground surface to allow for proper operation of UXO detection equipment and prevent the accidental detonation of UXO on the surface while providing clear enough ground surface visibility for OE workers. This level of clearance could be achieved using manual methods; however, the smaller cuttings generally fall to the ground where they may obscure or cover UXO. The larger cuttings could be gathered and hauled to a staging area for chipping or disposal.

Regrowth of Vegetation and Maintenance Requirements

Vegetation cleared by manual methods would not likely require additional cutting if each area has an OE Remedial Action immediately following vegetation clearance; however, standards for long-term maintenance of manually cleared vegetation within HMP areas have not been established.

Level of Effort in Terms of Personnel

Manual clearance would require coordination of numerous labor crews accompanied by UXO specialists working with vegetation clearance teams.

6.1.2 OE Remedial Action Alternatives

A range of OE Remedial Action Alternatives identified as applicable for removing UXO/OE at the former Fort Ord are considered herein:

- No Action with Existing Site Security Measures
- Enhanced Site Security Measures
- Identify and Remove OE.

This section presents a summary of each of the remedial alternatives that are considered further for development of OE Remedial Action Alternatives herein. Tables 6 through 8 present a summary and comparison of the alternatives for each IA site.

6.1.2.1 No Action with Existing Site Security Measures

The No Action with Existing Site Security Measures Alternative is provided, as required under CERCLA and the National Contingency Plan (NCP), as a baseline for comparison to the other proposed alternatives. This alternative assumes existing site access restrictions such as fencing, warning signs, and regular security patrols would be maintained in accordance with the Ordnance and Explosives Site Security Program Summary (*Army, 2001b*). There are no capital costs associated with the No Action with Existing Site Security Measures Alternative. O&M costs for the No Action with Existing Site Security Measures Alternative would include those associated with maintaining existing site access restrictions (maintenance of fences and signs and regular security patrols).

6.1.2.2 Enhanced Site Security Measures

The Enhanced Site Security Measures Alternative includes (1) maintenance of existing site security measures at the site (fencing, warning signs and security patrols) in accordance with the Ordnance and Explosives Site Security Program Summary for the former Fort Ord (*Army, 2001b*), (2) implementation of additional access controls as described below.

Warning Signs would identify the area behind the signs as a dangerous explosives area. They would be posted in a way that will ensure a person cannot enter the area without seeing at least one sign within a legible distance, and the signs should be multi-lingual. Typical signs are described in the Ordnance and Explosives Site Security Program Summary (*Army, 2001b*).

Informational Kiosks or display boards would provide safety information regarding OE hazards. Kiosks are described in the Ordnance and Explosives Site Security Program Summary (*Army, 2001b*).

Fencing would be selected based on land use and potential for residual hazard, but would likely be similar to the types described in the Ordnance and Explosives Site Security Program Summary (*Army, 2001b*)(four-strand barbed wire or chain link fence) and may be reinforced by concertina wire or thick vegetation.

Security Patrols may be required and employed by either private or governmental entities.

Many of the measures described above, such as fencing and warning signs, are already in place at the IA sites. Administrative controls, such as deed language or notifications, recurring reviews, siting, zoning, or deed restrictions, would be implemented on a programmatic basis at Fort Ord after the OE RI/FS is complete and long-term risk management measures are decided upon based on the results of the OE RI/FS.

6.1.2.2.1 Summary of Existing Site Security Measures

Each of the three IA sites already have fencing and warning signs and the area is patrolled regularly by a security service to reduce unauthorized entry into the IA sites as follows:

- **Ranges 43-48** – Access to the ranges are limited by four-strand barbed-wire fencing with one roll (and in some areas two rolls) of concertina wire behind the barbed wire. Each of five chain link access gates are reinforced with concertina wire, and warning signs are posted approximately every 500 feet along the fencing. A larger warning sign (4 foot by 6 foot) is also posted near the main access gate to the ranges. Patrols of perimeter fencing and access gates are conducted approximately every eight hours.

- **Range 30A** – Access to the range is limited by four-strand barbed-wire fencing with one roll (and in some areas two rolls) of concertina wire behind the barbed wire. Each of three chain link access gates are reinforced with concertina wire, and warning signs are posted approximately every 500 feet along the fencing. A larger warning sign (4 foot by 6 foot) is also posted near the main access gate to the range.

- **Site OE-16** – Access to the site is limited by 6-foot high temporary chain link fencing. There is one chain link access gate, and warning signs are posted approximately every 500 feet along the fencing. Patrols of perimeter fencing and the access gate are conducted approximately every eight hours.

As described in Section 5.2, existing access deterrents such as barbed-wire fencing, concertina wire, chain link fencing, and chain link gates posted with warning signs, and patrols discourage, but have not prevented entry into IA sites.

6.1.2.2.2 Description of Enhanced Site Security Measures for Alternative Evaluation

This IA evaluation focuses on improvements to existing site security measures at the IA sites, and makes the following assumptions:

- Existing fencing will be upgraded to the maximum level possible to deter access

- Large warning signs will be posted at a greater frequency along fencing and at access roads or gates that lead to IA sites

- The frequency of patrols will be increased around the perimeters of the sites.

Site-specific Enhanced Site Security Measures at each of the three IA sites will be as follows for the purposes of evaluating OE Remedial Action Alternatives:

- **Ranges 43-48** – The existing four-strand barbed wire fencing that currently encircles the MRA (and Ranges 43-48 within it) will be replaced with permanent 10-foot chain link fencing reinforced with concertina wire around the entire perimeter/boundary of Ranges 43-48. Each of the five chain link access gates will be replaced with 10-foot high chain link gates reinforced with concertina wire. Although these additional controls are considered as Interim Action measures, the Army intends for any measures implemented during Interim Action to be as consistent as possible with potential long-term remedies. Therefore, the integrity of the fencing will be monitored weekly and the fence will be repaired and maintained for an interim period of 5 years until long term O&M needs are determined in the basewide OE RI/FS. Warning signs will be posted approximately every 100 feet along the fence. Larger warning signs (4 foot by 6 foot) will be posted at each of the five access gates to the ranges. The frequency of patrols of perimeter fencing and access gates will be every four hours.

- **Range 30A** – The existing four-strand barbed-wire fencing will be replaced with permanent 10-foot chain link fencing reinforced with concertina wire around the entire perimeter/boundary of Range 30A. Each of the three chain link access gates will be replaced with 10-foot high chain link

gates reinforced with concertina wire. Although these additional controls are considered as Interim Action measures, the Army intends for any measures implemented during Interim Action to be as consistent as possible with potential long-term remedies. Therefore, the integrity of the fencing will be monitored weekly and the fence will be repaired and maintained for an interim period of 5 years until long term O&M needs are determined in the basewide OE RI/FS. Warning signs will be posted approximately every 100 feet along the fence. Larger warning signs (4 foot by 6 foot) will be posted at each of the five access gates to the range. The frequency of patrols of perimeter fencing and access gates will be every four hours.

- **Site OE-16** – The existing temporary 6-foot chain link fencing will be replaced with permanent 10-foot chain link fencing reinforced with concertina wire around the entire perimeter/boundary of Site OE-16. The chain link access gate will be replaced with a 10-foot high chain link gate reinforced with concertina wire. Although these additional controls are considered as Interim Action measures, the Army intends for any measures implemented during Interim Action to be as consistent as possible with potential long-term remedies. Therefore, the integrity of the fencing will be monitored weekly and the fence will be repaired and maintained for an interim period of 5 years until long term O&M needs are determined in the basewide OE RI/FS. Warning signs will be posted approximately every 100 feet along the fence. A larger warning sign (4 foot by 6 foot) will be posted at the access gate to the site. The frequency of patrols of perimeter fencing and the access gate will be four hours.

6.1.2.3 Identify and Remove OE

OE Remedial Action at the IA sites would consist of identifying, investigating and excavating OE found under one of the following scenarios:

- Surface OE Removal – Identify and Remove All OE on the Surface
- Subsurface OE Removal – Identify, Investigate, and Remove All Anomalies to Depths Consistent with Planned Reuse in Each Area
- OE Removal to Depth – Identify, Investigate, and Remove All Anomalies to Depth Found.

After vegetation clearance is performed using one of the Vegetation Clearance Alternatives described above, OE crews would walk the site using geophysical OE detection equipment. OE and any other anomalies identified visually or using the detection equipment would be investigated under one of the OE Remedial Action depth scenarios described above and if UXO was found, it would be detonated using one of the OE Detonation Alternatives described below. Detection equipment would be selected and Standard Operating Procedures (SOPs) would be performed in accordance with the *Ordnance Detection and Discrimination Study for Fort Ord* (*USACE, 2001*).

Screening evaluations of the three OE Remedial Action depth scenarios for each of the IA sites are presented in Tables B1, B2, and B3 of Appendix B (OE Depth of Remedial Action Screening Tables) for Ranges 43-48, Range 30A, and Site OE-16, respectively. Based on the results of the screening, Subsurface OE Removal (Identify, Investigate, and Remove All Anomalies to Depths Consistent with Planned Reuse in Each Area), was selected as the appropriate depth scenario for the Identify and Remove OE alternative for each of the IA Sites.

Subsurface OE Removal will consist of identification of OE (conduct a visual search and operate OE detection equipment), and investigation and removal of any OE found/detected on the ground surface of the site and in the subsurface to depths determined in the site-specific work plan. Subsurface OE removal depths will be determined based on (1) the type of OE, (2) the typical depth the type of OE is found, (3) planned reuse of specific areas within the IA site, and (4) the capabilities of the geophysical detection equipment selected as best suited for site conditions by the OE Site Geophysicist. The site-specific work plan outlining planned subsurface OE removal depths will be available for regulatory agency and public review.

Costs for Subsurface OE Removal are based on a range of costs associated with conducting a 1 foot to 4 foot OE removal consistent with the planned reuse in specific areas of the IA sites. Under the Subsurface OE Removal Alternative, existing site security measures such as fencing, warning signs, and security patrols would be maintained for an interim period of 5 years until long term O&M needs are determined in the basewide OE RI/FS.

6.1.3 OE Detonation Alternatives

OE Detonation consists of detonating any UXO found during physical removal of OE after vegetation clearance has been performed. OE remedial crews would conduct a visual search and walk the site using geophysical OE detection equipment. Any OE identified visually or using the detection equipment would be handled as follows depending on whether the item is transportable or nontransportable:

- All small arms/subcaliber OE items including bullets/ammunition and practice 35mm subcaliber M73 rockets (without spotting charge) would be transported offsite to a facility that would perform detonation by heating in a "popper oven" and the metal would be recycled. These transportable OE items would be excluded from onsite detonation procedures and are not considered further in the evaluation of detonation alternatives.

- ***Nontransportable OE Items*** – For the purposes of addressing OE at Fort Ord, non-transportable OE items include those that are non-movable (unsafe to move under any circumstances), and moveable (may be moved by hand only within close proximity to their original position for consolidation and/or to ensure detonations are performed under the safest possible conditions). Because nontransportable OE items are extremely dangerous and cannot be moved except under the circumstances described above, detonation-in-place with engineering controls is the selected alternative for all nontransportable OE items. Although detonation of OE has the potential to release air pollutants to the atmosphere, studies evaluated in the *Final Detonation Sampling and Analysis Plan* (*Harding ESE, 2000b*) indicate that air emissions from ordnance detonations at Fort Ord are not expected to be significant. OE detonation is not expected to cause significant impacts to soil based results of the *Basewide Remedial Investigation/Feasibility Study* (*Harding ESE, 1995a*) and on studies discussed in the *Final Ordnance Detonation Sampling and Analysis Plan* (*Harding ESE, 2000b*). Although the studies mentioned above indicate there would be no significant impacts to soil and/or air from OE detonation, the *Final Detonation Sampling and Analysis Plan* (*Harding ESE, 2000b*) presents approaches to further evaluate potential emissions to air and soil under Fort Ord-specific conditions using OE obtained from sampling and removal activities. In addition, detonation would be performed in conjunction with engineering controls that typically consist of covering the OE item to dampen the explosion and in turn minimize OE-related emissions as described below.

- ***Transportable OE Items*** –For the purposes of addressing OE at Fort Ord, transportable OE items are those that, as determined by the OE contractor (with concurrence of the USACE UXO Safety Specialist), may be transported by vehicle from their original position to an area outside the vicinity for the purposes of storage, consolidation with other items for detonation, or for offsite destruction. A range of methods for detonation of transportable OE items are available and potentially applicable at the IA sites. A summary and screening of these detonation methods is presented below.

OE Detonation Alternatives

No Action

The No Action Alternative is provided, as required under CERCLA and the NCP, as a baseline for comparison to the other proposed alternatives. This alternative assumes no action would be taken to detonate any OE items that are found leaving OE where it was found or stored.

Detonation with Engineering Controls

This method consists of applying additional detonating charges to single or consolidated OE items, and applying engineering controls (covering the OE with tamped dirt, sandbags, contained water, or other materials, and using foam tents or bomb pots) prior to detonation to control the blast and any fragmentation, emissions, or noise that would be associated with the detonation. The foam tent is not approved for use by Department of Defense Explosives Safety Board (DDESB) and the bomb pot is not designed for destruction of OE (it merely controls the direction of the blast by funneling it upward); therefore, these methods are eliminated from further consideration as engineering controls. Transportable OE items can be moved for consolidation purposes (in order to detonate several OE items at once) as described above. Although these methods are not capable of withstanding multiple detonations, they offer flexibility in managing the detonations depending on the type, location, and position of OE. Therefore, OE Detonation with Engineering Controls is retained for further consideration as an OE Detonation Alternative.

Detonation Chambers

Some specially designed detonation chambers that can withstand and contain the explosive force of the detonation are in development or are commercially available such as the Donovan Blast Chamber. The Donovan Blast Chamber is the only detonation chamber considered in this evaluation because it is the only one of its kind that has been approved for detonation of OE by the DDESB. The Donovan Blast Chamber (chamber) is capable of withstanding detonations up to every 5 minutes of munitions equivalent to two 81mm mortar rounds and the donor charge used to initiate detonation. It also captures and cleans the demolition gases, contains fragmentation, reduces noise associated with the detonation, and may reduce associated fire risks for transportable OE items. According to vendor specifications, the chamber is trailer-mounted and transportable over terrain where 4-wheel drive pickup trucks could typically travel. However, the vertical clearance of the trailer's undercarriage is 18 inches above ground surface and would not allow it to be transported over the majority of the terrain at the IA sites. The trailer-mounted chamber would have to be temporarily located immediately within the entrance of each of several access gates where it would be operated as a stationary device.

OE Items Eligible for Detonation in Chamber

For all of the IA sites, the OE items that could be detonated in the chamber would have to be transportable and 81mm in size or smaller, and would require additional handling of items to transport them to temporary chamber locations immediately within access gates to the IA sites.

Ranges 43-48

Based on the results of recent TCRA surface OE removals at Ranges 43-48 (Section 4.1.3.2), it is estimated that approximately 95 percent of OE items anticipated to be found at Ranges 43-48 would be nontransportable items that are too dangerous to be transported to the temporary detonation chamber locations. Therefore, use of and costs associated with the detonation chamber would be limited to 5 percent of the OE items that may be found.

Range 30A and Site OE-16

Based on the results of recent TCRA surface OE removals at Range 30A and Site OE-16 (Sections 4.2.3.2 and 4.3.3.2, respectively), adequate data was not available to determine percentages of OE items that would be eligible for detonation in the chamber. Therefore, based on general OE removal data collected during OE removals at Fort Ord, it is estimated that approximately 90 percent of OE items anticipated to be found at these IA sites would be nontransportable items that are too dangerous to be transported to the temporary detonation chamber locations. Therefore, use of and costs associated with the detonation chamber would be limited to 10 percent of the OE items that may be found.

The Detonation Chamber and Detonation with Engineering Controls Alternative is retained for further consideration as an OE Detonation Alternative because, even with the drawbacks mentioned above, they are capable of withstanding and containing multiple detonations and could be used for approximately 5 to 10 percent of the OE items requiring detonation. Use of the detonation chamber will therefore only be considered as a combination of 5 to 10 percent detonation chamber use and 90 to 95 percent detonation with engineering controls.

Offsite Destruction

Collection, transport, and offsite destruction of OE would eliminate onsite fragmentation, emissions, and fire risks associated with detonating OE at the IA sites. However, this method would require handling and transporting OE on public roadways in order to transfer it to the offsite facility, which would present unacceptable risks to the public and to workers. For these reasons, offsite destruction is eliminated from further consideration as an OE Detonation Alternative.

OE Detonation Methods Retained for Further Consideration

Based on the screening and analysis of the OE Detonations methods described above, the following methods were retained for further consideration as OE Detonation Alternatives and are described below:

- No Action
- Detonation with Engineering Controls
- Detonation Chamber and Detonation with Engineering Controls.

6.1.3.1 No Action

The No Action Alternative is required for consideration under CERCLA as a basis for comparison to the other alternatives, and would consist of taking no action to detonate any OE items found at the IA sites.

6.1.3.2 Detonation with Engineering Controls

The Detonation with Engineering Controls Alternative consists of applying additional detonating charges to single or consolidated OE items, and applying engineering controls (covering the OE with tamped dirt, sandbags, contained water, or other materials) prior to detonation to control the blast and any fragmentation, emissions, or noise that would be associated with the detonation. As described

above, this method would be applicable and well suited for detonations at the IA sites because it can be performed in any location OE is found during Physical Removal of OE.

6.1.3.3 Detonation Chamber and Detonation with Engineering Controls

The Detonation Chamber and Detonation with Engineering Controls Alternative consists of operation of the Donovan Blast Chamber for transportable OE items (approximately 5 to 10 percent of the total items) and using detonation with engineering controls as described above for nontransportable OE items (approximately 90 to 95 percent of the total items). The Donovan Chamber is the only type of chamber approved for use by the DDESB, and is a detonation containment device capable of withstanding multiple detonations. For 5 to 10 percent of the OE items found, this method would reduce noise and emissions, contain fragmentation, and reduce fire risks associated with detonations, but would require handling and transfer of OE over the 951 total acres of land found at the IA sites to the temporary chamber locations immediately within access gates to the IA sites. For the other 90 to 95 percent of the OE items found, applying engineering controls (covering the OE with tamped dirt, sandbags, contained water, foam tents, bomb pots, or other materials) prior to detonation to control the blast would also reduce noise and emissions, contain fragmentation, and reduce fire risks associated with detonations, but not to the same degree as detonation in the chamber.

6.2 Applicable or Relevant and Appropriate Requirements (ARARs)

This section presents a description and analysis of ARARs that are potentially applicable for the Interim Action Alternatives described in Section 6.1.

Section 121 of CERCLA requires that site cleanups comply with federal and state laws that are "applicable or relevant and appropriate requirements" (ARARs). Under CERCLA Section 121(d)(2), the federal ARARs for a remedial action could include requirements under any of the federal environmental laws. State ARARs include promulgated requirements under state environmental or facility siting laws that are more stringent than federal ARARs, and that have been identified in a timely manner, pursuant to 40 Code of Federal Regulations (CFR) Part 300.400(g)(4). A requirement may be either "applicable" or "relevant and appropriate." Potential federal and state ARARs that may be pertinent to OE-related Interim Actions at Fort Ord are listed in Table 5 and described below.

6.2.1 Definition of ARARs

Applicable requirements are defined as those cleanup or control standards, or other substantive environmental protection requirements, criteria, or limitations, promulgated under federal or state laws. Applicable requirements are identified on a site-specific basis by determination of whether the jurisdictional prerequisite of a requirement fully addresses the circumstances at the site or the proposed remedial activity. All pertinent jurisdictional prerequisites must be met for the requirement to be applicable. These jurisdictional prerequisites are as follows:

- The party must be subject to the law
- The substances or activities must fall under the authority of the law
- The law must be in effect at the time the activities occur
- The statute or regulation requires, limits, or protects the types of activities.

A requirement is applicable if the specific terms (or jurisdictional prerequisites) of the statute or regulation directly addresses the circumstances at the site.

"Relevant and appropriate" refers to those cleanup standards, or other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law, that while not necessarily applicable, address problems or situations sufficiently similar to those encountered at the CERLCA site, and whose use is well suited to the particular site (*EPA, 1993*). The relevance and appropriateness of a requirement can be judged by comparing a number of factors including the characteristics of the remedial action, the items in question, or the physical circumstances of the site, with those addressed in the requirement. If there is sufficient similarity between the requirements and the circumstances at the site, determination of the requirement as relevant and appropriate may be made.

Determining whether a requirement is both relevant and appropriate is a two-step process. First, to determine relevance, a comparison is made between the response action, location, or chemicals covered by the requirement and related conditions at the site, release, or potential remedy. A requirement is relevant if it generally pertains to these conditions. Second, to determine whether the requirement is appropriate, the comparison is further refined by focusing on the nature of the items, the characteristics of the site, the circumstances of the release, and the proposed response action. The requirement is appropriate if, based on such comparison, its use is well suited to the particular site. The facility must comply with the substantive elements of requirements that are determined to be both relevant and appropriate.

There are certain circumstances under which ARARs may be waived. CERCLA Section 121(d) allows the selection of alternatives that will not attain ARAR status if any of six conditions for a waiver of ARARs exists. However, the selected alternative must be protective even if an ARAR is waived. Only five of the conditions for a waiver may apply to a DoD site. The conditions for a waiver are as follows:

- The action selected is only part of a total response action that will attain the required level or standard of control when completed
- Compliance with the designated requirement at that site will result in greater risk to human health and the environment (e.g., worker safety) than alternative options
- Compliance with the designated requirement is technically impracticable from an engineering perspective
- The action selected will result in a standard of performance that is equivalent to an applicable requirement through the use of another method or approach
- A state requirement has not been equitably applied in similar circumstances on other clearance actions within the state
- A fund-financed clearance action does not provide a balance between available monies and the need for protection of human health and the environment at sites where the need is more immediate (not applicable to DoD sites).

To Be Considered Requirements (TBCs)

To Be Considered Requirements (TBCs), the final class of requirements considered by EPA during the development of ARARs, are non-promulgated advisories or guidance documents issued by federal or state governments. They do not have the status of ARARs, and are not legally binding, but may be considered in determining the necessary cleanup levels or actions to protect human health and the environment.

6.2.2 Types of ARARs

ARARs that govern actions at CERCLA sites fall into three broad categories based upon the chemical contamination present, site characteristics, and alternatives proposed for cleanup. These three categories (chemical-

specific, location-specific, and action-specific) are described in the following subsections.

Chemical-Specific ARARs

Chemical-specific ARARs include those environmental laws and regulations that regulate the release to the environment of materials with certain chemical or physical characteristics or that contain specified chemical compounds. These requirements generally set health or risk-based concentration limits or discharge limits for specific hazardous substances by media. Chemical-specific ARARs are triggered by the specific chemical contaminants found at a particular site. Examples of potential chemical-specific ARARs are effluent limitations, emission limitations, drinking water standards and hazardous waste characteristics identified for specific chemicals and compounds. A more stringent standard, requirement, criterion, or limitation promulgated pursuant to a state environmental statute and identified in a timely manner is also a potential ARAR.

Location-Specific ARARs

Location-specific ARARs govern activities in certain environmentally sensitive areas. These requirements are triggered by the particular location and the proposed activity at the site. An example of a location-specific ARAR is compliance with the Endangered Species Act of 1973, as amended, to avoid sensitive ecosystems or habitats. Location-specific ARARs also focus on wetland or floodplain protection areas, or archaeologically significant areas.

Action-Specific ARARs

Action-specific ARARs are restrictions that define acceptable treatment and disposal procedures for hazardous substances. These ARARs generally set performance, design, or other similar action-specific controls or restrictions on particular kinds of activities. An example might be a state Air Quality Management Authority that sets limitations on fugitive dust generated during grading and excavation activities during clearance action.

6.2.3 Application of ARARs at Former Fort Ord

In addition to ARARs being classified into three broad categories (i.e. chemical-specific, location-specific, and action-specific), each ARAR is also noted by the action that may be taken at Fort Ord in the process of OE remedial action. Thus, an ARAR may pertain to: (1) site preparation (vegetation clearance) that may involve prescribed burning, mechanical clearing, or manual clearance of vegetation; (2) existing or enhanced site security measures or physical removal of OE that may involve excavation; and (3) detonation of OE with engineering controls or detonation within a blast chamber. In many cases, an ARAR will pertain to more than one type of action stated above.

In determining whether a requirement is pertinent to OE site preparation (vegetation clearance), OE Remedial Action, and OE detonations at Fort Ord, potential ARARs are initially screened for applicability. If determined not to be applicable, the requirement is then reviewed for both relevance and appropriateness. Requirements that are considered to be relevant and appropriate command the same importance as applicable requirements. Potential federal and state ARARs that may be pertinent to vegetation clearance, OE Remedial Action, and OE detonations, at Fort Ord are listed in Table 5.

6.3 Evaluation and Comparison of Interim Action Alternatives

This section presents the evaluation and comparison of Interim Action Alternatives. The three-tiered Interim Action Alternatives for the IA sites developed in Section 6.1 are evaluated and compared to the nine criteria specified in the U.S. Environmental Protection Agency's (EPA) *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (*EPA, 1988*) (RI/FS Guidance). These nine criteria are:

1. Overall Protection of Human Health and the Environment
2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)
3. Long-Term Effectiveness and Permanence
4. Reduction of Toxicity, Mobility, or Volume Through Treatment
5. Short-Term Effectiveness
6. Implementability
7. Cost
8. State Acceptance
9. Community Acceptance.

The evaluation of Interim Action Alternatives is discussed within the following three categories that encompass the nine criteria:

- **Effectiveness** (Includes Overall Protection of Human Health and the Environment, Compliance with ARARs, and Short-Term Effectiveness, Long-Term Effectiveness and Permanence, Reduction of Toxicity, Mobility, or Volume Through Treatment)
- **Implementability** (Includes State and Community Acceptance, which will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received [*EPA, 1988*]).
- **Cost**

The three evaluation criteria categories used in the comparative analysis are described below:

Effectiveness
Effectiveness is the ability of the alternative to provide protection of human health and the environment in the short term and comply with ARARs. The evaluation of each alternative is based on the effectiveness of the alternative in: (1) meeting the remedial action objectives, (2) minimizing potential impacts to human health and the environment during and following implementation, (3) the reliability, proven history, and permanence of the alternative with respect to the conditions found at the site, (4) the ability of the alternative to achieve Reduction of Toxicity, Mobility, or Volume through Treatment of the components of concern, and (5) the ability to meet federal and state requirements.

Implementability
Implementability is based on the technical and administrative feasibility of applying a given alternative. Technical feasibility considerations include the availability of clearance, removal, storage, and disposal services, necessary equipment, and skilled workers to implement a particular option. Administrative feasibility includes obtaining necessary permits and regulatory approvals. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received (*EPA, 1988*).

Cost
Capital and operations and maintenance (O&M) costs are estimated for each alternative based on quotes for labor, materials, and equipment necessary to implement the alternative. For annual O&M costs, the net present value (NPV) is calculated over a period of years based on a 6.4 percent interest rate (Source: *Engineering News Record Cost Index for Construction, January, 2002*). The cost estimates have an accuracy of +50 percent/-30 percent.

Sections 6.3.1 through 6.3.3 and Tables 6 through 8 summarize the comparative analyses of alternatives for each of the three IA sites.

6.3.1 Ranges 43–48

The following Vegetation Clearance, OE Remedial Action, and OE Detonation Alternatives were developed for Ranges 43–48 and are compared below for each of the three categories. Table 6 presents a summary and comparison of the alternatives for Ranges 43-48. Based on the comparison, a three-tiered

Preliminarily Identified Preferred Alternative is selected for Ranges 43–48 and is summarized in Section 7.0 and in Table 9.

Vegetation Clearance Alternatives
No Action, Prescribed Burning, Mechanical Methods, Manual Methods.

OE Remedial Action Alternatives
No Action with Existing Site Security Measures, Enhanced Site Security Measures, Subsurface OE Removal (Identify, Investigate, and Remove All Anomalies to Depths Consistent with Planned Reuse in Each Area).

OE Detonation Alternatives
No Action, Detonation with Engineering Controls, Detonation Chamber and Detonation with Engineering Controls.

6.3.1.1 Effectiveness

The effectiveness of each of the alternatives is compared below.

6.3.1.1.1 Vegetation Clearance Alternatives

Each of the vegetation clearance alternatives was evaluated in terms of its effectiveness in clearing vegetation found at Ranges 43-48. The Army considered the use of different vegetation clearance alternatives and combinations of alternatives for specific areas within Ranges 43-48; however, there were sufficient reasons to discount the viability of a piecemeal approach to vegetation clearance as described below.

The No Action Alternative would not be effective in clearing vegetation. Manual and Mechanical Vegetation Clearance Alternatives (cutting) would be much less effective in the short term than the Prescribed Burning Alternative because cutting would not clear vegetation to the same level as burning. The criteria related to reduction of toxicity, mobility, or volume through treatment is not applicable to vegetation clearance. Cutting would require more time to clear the ranges than burning and would not be as protective of workers because they could come in contact with UXO while cutting (burning would be conducted remotely from areas being cleared).

Cutting at this site could not be conducted in compliance with the substantive elements of ARARs. The HMP that was developed as required by the Biological and Conference Opinion (*USFWS, 1993, 1997*) issued to the Army in accordance with the Endangered Species Act requires burning be used as the primary means of vegetation clearance in CMC habitat reserve areas. Fire is required to clear CMC vegetation because this habitat type contains many rare and endangered plant species, and in order to duplicate the natural processes that maintain the composition and distribution of these rare and protected plant species, fire is necessary. Cutting does not duplicate this natural process and based upon vegetation monitoring conducted on several sites where cutting was used at Fort Ord, the rare obligate seed – producing shrub species subject to management under the HMP would be substantially reduced or eliminated from sites cleared by cutting. Therefore, burning would have advantages in the long term compared to cutting. In addition, cutting could not be conducted in a manner that is protective of human health (OE workers would come in direct contact with OE while clearing vegetation) and the environment (the health of rare and endangered species would be compromised by cutting).

Burning would temporarily affect local air quality and may have impacts on human health due to smoke; however, the burn would be conducted under carefully controlled conditions and the public would be notified of the burn. Smoke management while conducting the burn and temporary relocation of individuals from areas affected by smoke to unaffected areas would minimize potential impacts of smoke from the burn on human health. Burning could be conducted in a manner that is protective of human health and the environment through these mitigation measures.

There is only one method (prescribed burning) approved for widespread use in CMC habitat present over the majority of Ranges 43-48 based on HMP requirements that limit the use of other methods to areas less than 50 acres in size. The use of other vegetation clearance methods would only be applicable to approximately 5 percent (50 acres of 951 total acres) of the IA sites, would take much longer to implement than burning, and therefore, significant benefits in adopting a piecemeal approach to vegetation clearance were not identified (except in the 72 acres of development area as described in Section 4.1).

6.3.1.1.2 OE Remedial Action Alternatives

Each of the OE Remedial Action Alternatives was evaluated in terms of its effectiveness in addressing OE risks at Ranges 43-48. The Army considered the use of different OE Remedial Action Alternatives and combinations of alternatives for specific areas within each of the IA sites; however, there were sufficient reasons to discount the viability of a piecemeal approach to OE Remedial Action as described below.

The No Action with Existing Site Security Measures and Enhanced Site Security Measures Alternatives would be much less effective than the Subsurface OE Removal Alternative because they would not achieve the same degree of hazard reduction and removal of the physical threat associated with the presence of OE in areas that may be accessed by the public. The Subsurface OE Removal Alternative would be effective because it meets the definition of an Interim Action as a remedial action that can be implemented quickly and that, although not necessarily intended as a final remedial measure at a site, substantially reduces potential immediate, imminent, and/or substantial risks to human health and is consistent with long term goals. However, remedial activities conducted at the IA sites will be evaluated under the basewide OE RI/FS to determine adequacy of actions taken and the need for further action, if any.

Methods that enhance or maintain existing site security measures (fencing, warning signs, security patrols) have been — and could continue to be — breached by trespassers, even with enhanced site security measures in place. Therefore, use of these methods in certain areas was not considered further because significant benefits in adopting a piecemeal approach to OE Remedial Action were not identified.

6.3.1.1.3 OE Detonation Alternatives

Each of the OE Detonation Alternatives was evaluated in terms of its effectiveness in detonating OE identified at Ranges 43-48. The Army considered the use of different OE Detonation Alternatives and combinations of alternatives for specific areas within Ranges 43-48 (the Detonation with Engineering Controls Alternative and the Detonation Chamber and Detonation with Engineering Controls Alternative) and determined Detonation with Engineering Controls best met the evaluation criteria for the entire IA site.

The No Action Alternative would not be effective, because UXO found at the IA sites is dangerous and requires detonation to render it safe. The Detonation with Engineering Controls Alternative would be much more effective than the Detonation Chamber and Detonation with Engineering Controls Alternative because:

- It would achieve the same degree of hazard reduction as the detonation chamber, and the detonation chamber can only be used on approximately 5 percent of the OE items anticipated to be found at Ranges 43-48
- Studies show no significant impacts on human health or the environment from detonation with engineering controls
- It is a proven and flexible method used at Fort Ord over many years that is considered safe for detonating any type of OE found at the ranges

- The chamber can only be used for OE items that are transportable to access gate locations where the chamber would be temporarily located and are 81mm or less in diameter, and only 5 percent of OE items would be transportable to the chamber

- It can be implemented immediately as OE is discovered over the course of physical removal of OE, and can be applied in-place or transferred with other OE items and detonated in consolidation shots

- Use of a detonation chamber would require OE at the ranges to be handled, moved, and stored/stockpiled prior to its operation, which would greatly increase safety hazards to workers associated with accidental detonation of OE

6.3.1.2 Implementability

The implementability of each of the alternatives is compared below. The implementability of these alternatives in terms of State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received (*EPA, 1988*).

6.3.1.2.1 Vegetation Clearance Alternatives

Although the No Action Alternative would be easy to implement because it takes no action to clear vegetation, it could not be implemented because worker safety requires vegetation be cleared to provide visibility of ground surface. Prescribed burning would be implementable as it has been used regularly in habitat areas containing rare, threatened and endangered species at Fort Ord and is the primary method approved by USFWS and designated in the HMP for clearing vegetation in habitat areas. Cutting would not be implementable in terms of administrative feasibility because it is only approved for use in limited applications (less than 50 acres) where burning cannot be conducted, and implementation of cutting in areas greater than 50 acres in size would not be consistent with the Biological and Conference Opinion (*USFWS, 1993; 1997*) issued by USFWS in accordance with the Endangered Species Act. . In addition, mobilizing and operating cutting equipment within rugged terrain containing UXO would be difficult to implement because some areas will not be accessible.

Burning would be somewhat difficult to implement from an administrative perspective because of air quality and some public concerns; however, potential effects would be mitigated during the burn because it would be conducted under carefully controlled conditions and the public would be notified of the burn. Smoke management while conducting the burn and temporary relocation of individuals from areas affected by smoke to unaffected areas would minimize potential adverse impacts of the smoke from the burn on human health.

6.3.1.2.2 OE Remedial Action Alternatives

No Action with Existing Site Security Measures would be the easiest OE Remedial Action Alternative to implement because it takes no further action to respond to OE risks at the site beyond those measures already in place at the ranges such as maintaining fencing, signs and security patrols for access control. The Enhanced Site Security Measures Alternative would be the second easiest to implement because it includes replacement of existing fencing with permanent 10-foot high chain link fencing reinforced with concertina wire, warning signs every 100 feet along the fence, additional large warning signs at access gates, increased security patrols, and maintenance of these controls for an interim period of 5 years until long term O&M needs are determined in the basewide OE RI/FS. Installation of fencing and signs would be performed with a full time OE escort.

The Subsurface OE Removal Alternative would be the most difficult to implement because it

includes OE Remedial Action at the ranges; however, OE Remedial Actions have been implemented regularly in such areas for many years at the former Fort Ord, and could be successfully implemented using readily available trained personnel and equipment once the vegetation has been removed. Current estimates indicate OE Remedial Action at each of the IA sites could be completed before vegetation grows back to a level that would make OE Remedial Action hazardous. Initial removal of surface OE items is the only activity that must be performed within the timeframe before vegetation grows back to ensure worker safety. Based on past experience by the Army's OE contractor, surface removal can be performed within the regrowth period of approximately one year for Ranges 43-48. Once surface OE has been removed, subsurface OE remedial operations can be performed as vegetation gradually grows back and would not disrupt digital geophysical surveys, excavation, and removal of subsurface OE items. The total duration of OE remedial activities for Ranges 43-48 is estimated at 25 months.

6.3.1.2.3 OE Detonation Alternatives

No Action would be the easiest OE Detonation Alternative to implement because it takes no further action to respond to risks associated with OE found during physical removal of OE. The Detonation with Engineering Controls Alternative would be easier to implement than the Detonation Chamber and Detonation with Engineering Controls Alternative because it consists of detonating any dangerous OE discovered during physical removal of OE in place or consolidating it nearby without having to handle or relocate the OE as would be required when using a detonation chamber. The Detonation Chamber and Detonation with Engineering Controls Alternative would be difficult to implement for the 5 percent of transportable OE items because it would require additional handling of OE to transport it to the chamber at temporary locations immediately within access gates, which would significantly increase the potential for accidental detonation of UXO and associated risks to workers. In addition, the chamber can only be used for approximately 5 percent of the OE items anticipated to be found at Ranges 43-48, so its implementability is limited. Detonation with Engineering Controls has been implemented regularly in such areas for many years at Fort Ord, and could be successfully implemented using readily available trained personnel and equipment during the course of physical removal of OE.

6.3.1.3 Cost

Cost estimates have been prepared for each of the alternatives. Detailed cost estimate tables are included in Appendix C. The cost criterion examines both capital costs and annual operations and maintenance (O&M) costs for the alternatives. Capital costs include contingencies, engineering, and supervision costs. O&M costs include annual fixed costs such as site labor costs, monitoring costs, and maintenance costs for existing or enhanced site security measures. These cost estimates are primarily for comparative purposes. Actual costs to perform work may vary and will be, to a large extent, dependent upon the duration of the alternatives, and the actual extent of OE-related impacts discovered at each IA site. The cost estimates have an accuracy of +50 percent/-30 percent.

6.3.1.3.1 Vegetation Clearance Alternatives

Capital, O&M, and total costs for each of the Vegetation Clearance Alternatives are summarized below.

Capital Costs

Capital costs for implementing Vegetation Clearance Alternatives at Ranges 43-48 vary from $0 for the No Action Alternative to $1.7 million for the Prescribed Burning Alternative (Table C1 of Appendix C), to

$1.4 million for the Mechanical Clearance Alternative (Table C2 of Appendix C), and $2.5 million for the Manual Clearance Alternative (Table C3 of Appendix C).

O&M Costs

O&M costs for each of the Vegetation Clearance Alternatives were estimated over a monitoring period of five years assumed to be necessary to monitor the recovery of the habitat as specified in the HMP. Long-term O&M costs for monitoring after implementation of each of the Vegetation Clearance Alternatives range from $0 for the No Action Alternative to $213,000 for the Prescribed Burning, Mechanical, and Manual Clearance Alternatives (Tables C1, C2, and C3 of Appendix C). These cost estimates do not include the cost to implement corrective measures such as active plantings and additional monitoring and reporting if the HMP success criteria are not met. The costs to repair damages caused to the CMC habitat areas would likely be significant if methods other than prescribed burning are used, which is the only method approved for vegetation clearance of CMC habitat found at the site for areas greater than 50 acres.

Total Costs

Total costs for the Vegetation Clearance Alternatives vary from $0 per acre ($0 total) for the No Action Alternative to $3,972 per acre ($1.9 million total) for the Prescribed Burning Alternative (Table C1 of Appendix C), to $3,350 per acre ($1.6 million total) for the Mechanical Clearance Alternative (Table C2 of Appendix C), to $5,713 per acre ($2.8 million total) for the Manual Clearance Alternative (Table C3 of Appendix C) as shown in Appendix C and summarized in Table 6. Excluding the No Action Alternative, which has no costs, long-term O&M costs for monitoring the recovery of the habitat for a period of five years as specified in the HMP are included in the total costs.

6.3.1.3.2 OE Remedial Action Alternatives

Capital, O&M, and total costs for each of the OE Remedial Action Alternatives are summarized below. The cost estimates have an accuracy of +50 percent/-30 percent.

Capital Costs

Capital costs for implementing OE Remedial Action Alternatives range from $0 for the No Action with Existing Site Security Measures Alternative (Table C4 of Appendix C), to $1.1 million for the Enhanced Site Security Measures Alternative (Table C5 of Appendix C), and range from $10.6 to $11.2 million for the Subsurface OE Removal Alternative (Table C6 of Appendix C).

O&M Costs

O&M costs for the OE Remedial Action Alternatives are applicable only to the No Action with Existing Site Security Measures and Enhanced Site Security Measures Alternatives and were estimated for an interim period of 5 years until long term O&M needs are determined in the basewide OE RI/FS. A present worth analysis was used to evaluate expenditures that would occur over the 5-year time period (i.e., O&M costs) by discounting all future costs to 2002, the base year for this report. This procedure allows the cost of the alternative to be compared on the basis of a single figure representing the amount of money that, if invested in 2002 and disbursed as needed, would be sufficient to cover all costs associated with the action over its planned life. In

conducting the present worth analysis, the Net Present Value (NPV) was calculated for an interim period of 5 years until long term O&M needs are determined in the basewide OE RI/FS based on a 6.4 percent interest rate (Source: *Engineering News Record Cost Index for Construction, January 2002*). O&M costs for the No Action with Existing Site Security Measures Alternative were estimated at $235,000 (Table C4 of Appendix C) and were estimated at $3.4 million for the Enhanced Site Security Measures Alternative (Table C5 of Appendix C) for an interim period of 5 years until long term O&M needs are determined in the basewide OE RI/FS. The Subsurface OE Removal Alternatives has no associated O&M costs.

Total Costs

Total costs for the OE Remedial Action Alternatives vary from $486 per acre ($235,000 total) for the No Action with Existing Site Security Measures Alternative (Table C4 of Appendix C), to $9,222 per acre ($4.5 million total) for the Enhanced Site Security Measures Alternative (Table C5 of Appendix C), and range from $22,013 to $23,109 per acre ($10.6 to $11.2 million total) for the Subsurface OE Removal Alternative (Table C6 of Appendix C) as shown in Appendix C and summarized in Table 6. Long-term O&M costs associated with the No Action with Existing Site Security Measures and Enhanced Site Security Measures Alternatives for a period of five years are included in the total costs.

6.3.1.3.3 OE Detonation Alternatives

Capital, O&M, and total costs for each of the OE Detonation Alternatives are summarized below. The cost estimates have an accuracy of +50 percent/-30 percent.

Capital Costs

Capital costs for the OE Detonation Alternatives range from $0 for the No Action Alternative to $1.1 million for the Detonation with Engineering Controls Alternative (Table C7 of Appendix C) to $1.1 million for the Detonation Chamber and Detonation with Engineering Controls Alternative (Table C8 of Appendix C).

O&M Costs

There are no operations and maintenance costs for the OE Detonation Alternatives.

Total Costs

Total costs for the OE Detonation Alternatives vary from $0 per acre ($0 total) for the No Action Alternative, to $2,221 per acre ($1.1 million total) for the Detonation with Engineering Controls Alternative (Table C7 of Appendix C), to $2,361 per acre ($1.1 million total) for the Detonation Chamber and Detonation with Engineering Controls Alternative (Table C8 of Appendix C) as shown in Appendix C and summarized in Table 6.

6.3.2 Range 30A

The following Vegetation Clearance, OE Remedial Action, and OE Detonation Alternatives were developed for Range 30A and are compared below for each of the three categories. Table 7 presents a summary and comparison of the alternatives for Range 30A. Based on the comparison, a three-tiered Preliminarily Identified Preferred Alternative is selected for Range 30A and is summarized in Table 10 and Section 7.0.

Vegetation Clearance Alternatives
No Action, Prescribed Burning, Mechanical Methods, Manual Methods.

OE Remedial Action Alternatives
No Action with Existing Site Security Measures, Enhanced Site Security Measures, Subsurface OE Removal (Identify, Investigate, and Remove All Anomalies to Depths Consistent with Planned Reuse in Each Area).

OE Detonation Alternatives
No Action, Detonation with Engineering Controls, Detonation Chamber and Detonation with Engineering Controls.

6.3.2.1 Effectiveness

The effectiveness of each of the alternatives is compared below.

6.3.2.1.1 Vegetation Clearance Alternatives

Each of the vegetation clearance alternatives was evaluated in terms of its effectiveness in clearing vegetation found at Range 30A. The Army considered the use of different vegetation clearance alternatives and combinations of alternatives for specific areas within Range 30A; however, there were sufficient reasons to discount the viability of a piecemeal approach to vegetation clearance as described below.

The No Action Alternative would not be effective in clearing vegetation. Manual and Mechanical Vegetation Clearance Alternatives (cutting) would be much less effective in the short term than the Prescribed Burning Alternative because cutting would not clear vegetation to the same level as burning. The criteria related to reduction of toxicity, mobility, or volume through treatment is not applicable to vegetation clearance. Cutting would require more time to clear the ranges than burning and would not be as protective of workers because they could come in contact with UXO while cutting (burning would be conducted remotely from areas being cleared).

Cutting at this site could not be conducted in compliance with the substantive elements of ARARs. The HMP that was developed as required by the Biological and Conference Opinion (*USFWS, 1993, 1997*) issued to the Army in accordance with the Endangered Species Act requires burning be used as the primary means of vegetation clearance in CMC habitat reserve areas. Fire is required to clear CMC vegetation because this habitat type contains many rare and endangered plant species, and in order to duplicate the natural processes that maintain the composition and distribution of these rare and protected plant species, fire is necessary. Cutting does not duplicate this natural process and based upon vegetation monitoring conducted on several sites where cutting was used at Fort Ord, the rare obligate seed – producing shrub species subject to management under the HMP would be substantially reduced or eliminated from sites cleared by cutting. Therefore, burning would have advantages in the long term compared to cutting. In addition, cutting could not be conducted in a manner that is protective of human health (OE workers would come in direct contact with OE while clearing vegetation) and the environment (the health of rare and endangered species would be compromised by cutting).

Burning would temporarily affect air quality and may have impacts on human health due to smoke; however, the burn would be conducted under carefully controlled conditions and the public would be notified of the burn. Smoke management while conducting the burn and temporary relocation of individuals from areas affected by smoke to unaffected areas would minimize potential adverse impacts of smoke from the burn on human health. Burning could be conducted in a manner that is protective of human health and the environment through these mitigation measures.

There is only one method (prescribed burning) approved for widespread use in CMC habitat present over the majority of Range 30A based on HMP requirements that limit the use of other methods to areas less than 50 acres in size. The

use of other vegetation clearance methods would only be applicable to approximately 5 percent (50 acres of 951 total acres) of the IA sites, would take much longer to implement than burning, and therefore, significant benefits in adopting a piecemeal approach to vegetation clearance were not identified.

6.3.2.1.2 OE Remedial Action Alternatives

Each of the OE Remedial Action Alternatives was evaluated in terms of its effectiveness in addressing OE risks at Range 30A. The Army considered the use of different OE Remedial Action Alternatives and combinations of alternatives for specific areas within Range 30A; however, there were sufficient reasons to discount the viability of a piecemeal approach to OE Remedial Action as described below.

The No Action with Existing Site Security Measures and Enhanced Site Security Measures Alternatives would be much less effective than the Subsurface OE Removal Alternative because they would not achieve the same degree of hazard reduction as OE Remedial Action, which removes the physical threat associated with the presence of OE in areas that may be accessed by the public. The Subsurface OE Removal Alternative would be effective because it meets the definition of an Interim Action as a remedial action that can be implemented quickly and that, although not necessarily intended as a final remedial measure at a site, substantially reduces potential immediate, imminent, and/or substantial risks to human health and is consistent with long term goals. However, remedial activities conducted at the IA sites will be evaluated under the basewide OE RI/FS to determine adequacy of actions taken and the need for further action, if any.

Methods that enhance or maintain existing site security measures (fencing, warning signs, security patrols) have been — and could continue to be — breached by trespassers, even with enhanced site security measures in place. Therefore, use of these methods in certain areas was not considered further because significant benefits in adopting a piecemeal approach to OE Remedial Action were not identified.

6.3.2.1.3 OE Detonation Alternatives

Each of the OE Detonation Alternatives was evaluated in terms of its effectiveness in detonating OE identified at Range 30A. The Army considered the use of different OE Detonation Alternatives and combinations of alternatives for specific areas within Ranges 43-48 (the Detonation with Engineering Controls Alternative and the Detonation Chamber and Detonation with Engineering Controls Alternative) and determined Detonation with Engineering Controls best met the evaluation criteria for the entire IA site.

The No Action Alternative would not be effective, because UXO found at the IA sites is dangerous and requires detonation to render it safe. The Detonation with Engineering Controls Alternative would be much more effective than the Detonation Chamber and Detonation with Engineering Controls Alternative because:

- It would achieve the same degree of hazard reduction as the detonation chamber, and the detonation chamber can only be used on approximately 10 percent of the OE items anticipated to be found at Range 30A
- It is a proven and flexible method used at Fort Ord over many years that is considered safe for detonating any type of OE found at the ranges
- The chamber can only be used for OE items that are transportable and 81mm or less in diameter and would require additional handling of UXO to transport it to the temporary chamber locations immediately within access gates to the site
- It can be implemented immediately as OE is discovered over the course of physical removal of OE, and can be applied in-place or transferred with other OE items and detonated in consolidation shots

- Use of a detonation chamber would require OE at the ranges to be handled, moved, and stored/stockpiled prior to its operation, which would greatly increase safety hazards to workers associated with accidental detonation of OE

A combination of these methods in certain areas was not considered further because significant benefits in adopting a piecemeal approach to OE detonation were not identified.

6.3.2.2 Implementability

The implementability of each of the alternatives is compared below. The implementability of these alternatives in terms of State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received (*EPA, 1988*).

6.3.2.2.1 Vegetation Clearance Alternatives

The No Action Alternative would be the easiest to implement, but worker safety considerations and protocols require vegetation be cleared to improve ground surface visibility. Prescribed burning would be implementable as it has been used regularly in habitat areas containing rare, threatened and endangered species at Fort Ord and is the primary method approved by the USFWS and designated in the HMP for clearing vegetation in habitat areas. Cutting would not be implementable in terms of administrative feasibility because it is only approved for use in limited applications (less than 50 acres) where burning cannot be conducted, and implementation of cutting in areas greater than 50 acres in size would not be consistent with the Biological and Conference Opinion (*USFWS, 1993; 1997*) issued by USFWS in accordance with the Endangered Species Act. In addition, mobilizing and operating cutting equipment within rugged terrain containing UXO would be difficult to implement because some areas will not be accessible. Burning would be somewhat difficult to implement from an administrative perspective because of air quality and some public concerns; however, potential effects would be mitigated during the burn because it would be conducted under carefully controlled conditions and the public would be notified of the burn. Smoke management while conducting the burn and temporary relocation of individuals from areas affected by smoke to unaffected areas would minimize potential impacts of smoke from the burn on human health.

6.3.2.2.2 OE Remedial Action Alternatives

No Action with Existing Site Security Measures would be the easiest OE Remedial Action Alternative to implement because it takes no further action to respond to OE risks at the site beyond those measures already in place at Range 30A such as maintaining fencing and warning signs and conducting patrols to limit access to the site. The Enhanced Site Security Measures Alternative includes replacement of existing fencing with permanent 10-foot high chain link fencing reinforced with concertina wire, warning signs every 100 feet along the fence, additional large warning signs at access gates, increased security patrols, and maintenance of these controls for an interim period of 5 years until long term O&M needs are determined in the basewide OE RI/FS. Installation of fencing and signs would be performed with a full time OE escort.

The Subsurface OE Removal Alternative would be the most difficult to implement because it includes OE Remedial Action at Range 30A; however, OE Remedial Actions have been implemented regularly in such areas for many years at the former Fort Ord, and could be successfully implemented using readily available trained personnel and equipment once the vegetation has been removed. Current estimates indicate OE Remedial Action at each of the IA sites could be completed before vegetation grows back to a level that would make OE Remedial Action hazardous. Initial removal of surface OE items is the only activity that must be performed within the timeframe

before vegetation grows back to endure OE worker safety. Based on past experience by the Army's OE contractor, surface removal can be performed within the regrowth period of approximately one year for Range 30A. Once surface OE has been removed, subsurface OE remedial operations can be performed as vegetation gradually grows back and would not disrupt digital geophysical surveys, excavation, and removal of subsurface OE items. The total duration of OE remedial activities for Range 30A is estimated at 15 months.

6.3.2.2.3 OE Detonation Alternatives

No Action would be the easiest OE Detonation Alternative to implement because it takes no further action to respond to risks associated with OE found during physical removal of OE. The Detonation with Engineering Controls Alternative would be easier to implement than the Detonation Chamber and Detonation with Engineering Controls Alternative because it consists of detonating any dangerous OE discovered during physical removal of OE in place or consolidating it nearby without having to handle or relocate the OE as would be required when using a detonation chamber. The Detonation Chamber and Detonation with Engineering Controls Alternative would be difficult to implement because it would require OE items be transported to temporary chamber locations immediately within access gates to the site, which would significantly increase the potential for accidental detonation of UXO and associated risks to workers. In addition, the chamber can only be used for approximately 10 percent of the OE items anticipated to be found at Range 30A, so its implementability is limited. Detonation with Engineering Controls has been implemented regularly in such areas for many years at Fort Ord, and could be successfully implemented using readily available trained personnel and equipment during the course of physical removal of OE.

6.3.2.3 Cost

Cost estimates have been prepared for each of the alternatives. Detailed cost estimate tables are included in Appendix C. The cost criterion examines both capital costs and annual operations and maintenance (O&M) costs for the alternatives. Capital costs include contingencies, engineering, and supervision costs. O&M costs include annual fixed costs such as site labor costs, monitoring costs, and maintenance costs for existing or enhanced site security measures. These cost estimates are primarily for comparative purposes. Actual costs to perform work may vary and will be, to a large extent, dependent upon the duration of the alternatives, and the actual extent of OE-related impacts discovered at each IA site. The cost estimates have an accuracy of +50 percent/-30 percent.

6.3.2.3.1 Vegetation Clearance Alternatives

Capital, O&M, and total costs for each of the Vegetation Clearance Alternatives are summarized below.

Capital Costs

Capital costs for implementing Vegetation Clearance Alternatives range from $0 for the No Action Alternative to $1.4 million for the Prescribed Burning Alternative (Table C9 of Appendix C), to $1.1 million for the Mechanical Clearance Alternative (Table C10 of Appendix C), and $2.0 million for the Manual Clearance Alternative (Table C11 of Appendix C).

O&M Costs

O&M costs for each of the Vegetation Clearance Alternatives were estimated over a monitoring period of five years assumed to be necessary to monitor the recovery of the habitat as specified in the HMP. Long-term O&M costs for

monitoring after implementation of each of the Vegetation Clearance Alternatives range from $0 for the No Action Alternative to $149,000 for the Prescribed Burning, Mechanical Clearance, and Manual Clearance Alternatives (Tables C9, C10, and C11 of Appendix C). These cost estimates do not include the cost to implement corrective measures such as active plantings and additional monitoring and reporting if the HMP success criteria are not met. The costs to repair damages caused to the CMC habitat areas would likely be significant if methods other than prescribed burning are used, which is the only method approved for vegetation clearance of CMC habitat found at the site for areas greater than 50 acres.

Total Costs

Total costs for the Vegetation Clearance Alternatives vary from $0 per acre ($0 total) for the No Action Alternative to $3,906 per acre ($1.5 million total) for the Prescribed Burning Alternative (Table C9 of Appendix C), to $3,178 per acre ($1.2 million total) for the Mechanical Clearance Alternative (Table C10 of Appendix C), to $5,481 per acre ($2.1 million total) for the Manual Clearance Alternative (Table C11 of Appendix C) as shown in Appendix C and summarized in Table 7. Excluding the No Action Alternative, which has no costs, long-term O&M costs for monitoring the recovery of the habitat for a period of five years as specified in the HMP are included in the total costs.

6.3.2.3.2 OE Remedial Action Alternatives

Capital, O&M, and total costs for each of the OE Remedial Action Alternatives are summarized below. The cost estimates have an accuracy of +50 percent/-30 percent.

Capital Costs

Capital Costs for the OE Remedial Action Alternatives vary from $0 for the No Action with Existing Site Security Measures Alternative (Table C12 of Appendix C), to $1.0 million for the Enhanced Site Security Measures Alternative (Table C13 of Appendix C), to $6.8 to $7.7 million for the Subsurface OE Removal Alternative (Table C14 of Appendix C) as shown in Appendix C and summarized in Table 7.

O&M Costs

O&M costs for the OE Remedial Action Alternatives are only applicable for the No Action with Existing Site Security Measures and Enhanced Site Security Measures Alternatives and were estimated for an interim period of 5 years until long term O&M needs are determined in the basewide OE RI/FS. A present worth analysis was used to evaluate expenditures that would occur for an interim period of 5 years until long term O&M needs are determined in the basewide OE RI/FS (i.e., O&M costs) by discounting all future costs to 2002, the base year for this report. This procedure allows the cost of the alternative to be compared on the basis of a single figure representing the amount of money that, if invested in 2002 and disbursed as needed, would be sufficient to cover all costs associated with the action over its planned life. In conducting the present worth analysis, the NPV was calculated for an interim period of 5 years until long term O&M needs are determined in the basewide OE RI/FS based on a 6.4 percent interest rate (Source: *Engineering News Record Cost Index for Construction, January 2002*). O&M costs were

estimated at $164,000 for The No Action with Existing Site Security Measures Alternative (Table C12 of Appendix C) and $3.2 million for the Enhanced Site Security Measures Alternative (Table C13 of Appendix C) for an interim period of 5 years until long term O&M needs are determined in the basewide OE RI/FS. The Subsurface OE Removal Alternatives has no associated O&M costs.

Total Costs

Total costs for the OE Remedial Action Alternatives vary from $423 per acre ($164,000 total) for the No Action with Existing Site Security Measures Alternative (Table C12 of Appendix C), to $10,871 per acre ($4.2 million total) for the Enhanced Site Security Measures Alternative (Table C13 of Appendix C), and range from $17,511 to $19,895 per acre ($6.8 to $7.7 million total) for the Subsurface OE Removal Alternative (Table C14 of Appendix C) as shown in Appendix C and summarized in Table 7. Long-term O&M costs associated with the No Action with Existing Site Security Measures and Enhanced Site Security Measures Alternatives for a period of five years are included in the total costs.

6.3.2.3.3 OE Detonation Alternatives

Capital, O&M, and total costs for each of the OE Detonation Alternatives are summarized below. The cost estimates have an accuracy of +50 percent/-30 percent.

Capital Costs

Capital costs for the OE Detonation Alternatives range from $0 for the No Action Alternative to $124,000 for the Detonation with Engineering Controls Alternative (Table C15 of Appendix C), to $136,000 for the Detonation Chamber and Detonation with Engineering Controls Alternative (Table C16 of Appendix C).

O&M Costs

There are no operations and maintenance costs for the OE Detonation Alternatives.

Total Costs

Total costs for the OE Detonation Alternatives vary from $0 per acre ($0 total) for the No Action Alternative, to $319 per acre ($124,000 total) for the Detonation with Engineering Controls Alternative (Table C15 of Appendix C), to $352 per acre ($136,000 total) for the Detonation Chamber and Detonation with Engineering Controls Alternative (Table C16 of Appendix C) as shown in Appendix C and summarized in Table 7.

6.3.3 Site OE-16

The following Vegetation Clearance, OE Remedial Action, and OE Detonation Alternatives were developed for Site OE-16 and are compared below for each of the three categories. Table 8 presents a summary and comparison of the alternatives for Site OE-16. Based on the comparison, a three-tiered Preliminarily Identified Preferred Alternative is selected for Site OE-16 and is summarized in Table 11 and Section 7.0.

Vegetation Clearance Alternatives
No Action, Prescribed Burning, Mechanical Methods, Manual Methods.

OE Remedial Action Alternatives
No Action with Existing Site Security Measures, Enhanced Site Security Measures, Subsurface OE Removal (Identify, Investigate, and Remove All Anomalies to Depths Consistent with Planned Reuse in Each Area).

OE Detonation Alternatives
No Action, Detonation with Engineering Controls, Detonation Chamber and Detonation with Engineering Controls.

6.3.3.1 Effectiveness

The effectiveness of each of the alternatives is compared below.

6.3.3.1.1 Vegetation Clearance Alternatives

Each of the vegetation clearance alternatives was evaluated in terms of its effectiveness in clearing vegetation found at Site OE-16. The Army considered the use of different vegetation clearance alternatives and combinations of alternatives for specific areas within Site OE-16; however, there were sufficient reasons to discount the viability of a piecemeal approach to vegetation clearance as described below.
The No Action Alternative would not be effective in clearing vegetation. Manual and Mechanical Vegetation Clearance Alternatives (cutting) would be much less effective in the short term than the Prescribed Burning Alternative because cutting would not clear vegetation to the same level as burning. The criteria related to reduction of toxicity, mobility, or volume through treatment is not applicable to vegetation clearance. Cutting would require more time to clear the ranges than burning and would not be as protective of workers because they could come in contact with UXO while cutting (burning would be conducted remotely from areas being cleared).
Cutting at this site could not be conducted in compliance with the substantive elements of ARARs. The HMP that was developed as required by the Biological and Conference Opinion (*USFWS, 1993; 1997*) issued to the Army in accordance with the Endangered Species Act requires burning be used as the primary means of vegetation clearance in CMC habitat reserve areas. Fire is required to clear CMC vegetation because this habitat type contains many rare and endangered plant species, and in order to duplicate the natural processes that maintain the composition and distribution of these rare and protected plant species, fire is necessary. Cutting does not duplicate this natural process and based upon vegetation monitoring conducted on several sites where cutting was used at Fort Ord, the rare obligate seed – producing shrub species subject to management under the HMP would be substantially reduced or eliminated from sites cleared by cutting. Therefore, burning would have advantages in the long term compared to cutting. In addition, cutting could not be conducted in a manner that is protective of human health (OE workers would come in direct contact with OE while clearing vegetation) and the environment (the health of rare and endangered species would be compromised by cutting).

Burning would temporarily affect air quality and may have impacts on human health due to smoke; however, the burn would be conducted under carefully controlled conditions and the public would be notified of the burn. Smoke management while conducting the burn and temporary relocation of individuals from areas affected by smoke to unaffected areas would minimize potential impacts of smoke from the burn on human health. Burning could be conducted in a manner that is protective of human health and the environment through these mitigation measures.

There is only one method (prescribed burning) approved for widespread use in CMC habitat present over the majority of Site OE-16 based on HMP requirements that limit the use of other methods to areas less than 50 acres in size. The use of other vegetation clearance methods would only be applicable to approximately 5 percent (50 acres of 951 total acres) of the IA sites, would take much longer to implement than burning, and therefore, significant benefits in adopting a piecemeal approach to vegetation clearance were not identified.

6.3.3.1.2 OE Remedial Action Alternatives

Each of the OE Remedial Action Alternatives was evaluated in terms of its effectiveness in addressing OE risks at Site OE-16. The Army considered the use of different OE Remedial Action Alternatives and combinations of alternatives for specific areas within Site OE-16; however, there were sufficient reasons to discount the viability of a piecemeal approach to OE Remedial Action as described below.

The No Action with Existing Site Security Measures and Enhanced Site Security Measures Alternatives would be much less effective than the Subsurface OE Removal Alternative because they would not achieve the same degree of hazard reduction as the Subsurface OE Removal Alternative, which removes the physical threat associated with the presence of OE in areas that may be accessed by the public. The Subsurface OE Removal Alternative would be effective because it meets the definition of an Interim Action that can be implemented quickly and that, although not necessarily intended as a final remedial measure at a site, substantially reduces potential immediate, imminent, and/or substantial risks to human health and is consistent with long term goals.

Methods that enhance or maintain existing site security measures (fencing, warning signs, security patrols) have been — and could continue to be — breached by trespassers, even with enhanced site security measures in place. Therefore, use of these methods in certain areas was not considered further because significant benefits in adopting a piecemeal approach to OE Remedial Action were not identified.

Remedial activities conducted at the IA sites will be evaluated under the basewide OE RI/FS to determine adequacy of actions taken and the need for further action, if any.

6.3.3.1.3 OE Detonation Alternatives

Each of the OE Detonation Alternatives was evaluated in terms of its effectiveness in detonating OE identified at Site OE-16. The Army considered the use of different OE Detonation Alternatives and combinations of alternatives for specific areas within Ranges 43-48 (the Detonation with Engineering Controls Alternative and the Detonation Chamber and Detonation with Engineering Controls Alternative) and determined Detonation with Engineering Controls best met the evaluation criteria for the entire IA site.

The No Action Alternative would not be effective, because UXO found at the IA sites is dangerous and requires detonation to render it safe. The Detonation with Engineering Controls Alternative would be much more effective than the Detonation Chamber and Detonation with Engineering Controls Alternative because:

- It would achieve the same degree of hazard reduction as the detonation chamber, and the detonation chamber can only be used on approximately 10 percent of the OE items anticipated to be found at Site OE-16
- It is a proven and flexible method used at Fort Ord over many years that is considered safe for detonating any type of OE found at the ranges
- The chamber can only be used for transportable OE items that are 81mm or less in diameter, and would require additional handling of OE items to transport them to temporary chamber locations immediately within access gates to the site
- It can be implemented immediately as OE is discovered over the course of physical removal of OE, and can be applied in-place or transferred with other OE items and detonated in consolidation shots
- Use of a detonation chamber would require OE at the ranges to be handled, moved, and

stored/stockpiled prior to its operation, which would greatly increase safety hazards to workers associated with accidental detonation of OE.

A combination of these methods in certain areas was not considered further because significant benefits in adopting a piecemeal approach to OE detonation were not identified.

6.3.3.2 Implementability

The implementability of each of the alternatives is compared below. The implementability of these alternatives in terms of State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received (*EPA, 1988*).

6.3.3.2.1 Vegetation Clearance Alternatives

The No Action Alternative would not be implementable because it takes no action to clear vegetation, which is required for OE worker safety. Prescribed burning would be implementable as it has been used regularly in habitat areas containing rare, threatened and endangered species at Fort Ord and is the primary method approved by USFWS and designated in the HMP for clearing vegetation in habitat areas. Cutting would not be implementable in terms of administrative feasibility because it is only approved for use in limited applications (less than 50 acres) where burning cannot be conducted, and implementation of cutting in areas greater than 50 acres in size would not be consistent with the Biological and Conference Opinion (*USFWS, 1993, 1997*) issued by USFWS in accordance with the Endangered Species Act. . In addition, mobilizing and operating cutting equipment within rugged terrain containing UXO would be difficult to implement because some areas will not be accessible. Burning would be somewhat difficult to implement from an administrative perspective because of air quality and some public concerns; however, potential effects would be mitigated during the burn because it would be conducted under carefully controlled conditions and the public would be notified of the burn. Smoke management while conducting the burn and temporary relocation of individuals from areas affected by smoke to unaffected areas would minimize potential adverse impacts of smoke from the burn on human health.

6.3.3.2.2 OE Remedial Action Alternatives

No Action with Existing Site Security Measures would be the easiest OE Remedial Action Alternative to implement because it takes no further action to respond to OE risks at the site beyond those measures already in place at Site OE-16 such as maintaining fencing, warning signs and security patrols for access control. The Enhanced Site Security Measures Alternative would be the second easiest to implement because it includes replacement of existing fencing with permanent 10-foot high chain link fencing reinforced with concertina wire, warning signs every 100 feet along the fence, additional large warning signs at access gates, increased security patrols, and maintenance of these controls for an interim period of 5 years until long term O&M needs are determined in the basewide OE RI/FS. Installation of fencing and signs would be performed with a full time OE escort.

The Subsurface OE Removal Alternative would be the most difficult to implement because it includes OE Remedial Action at Site OE-16; however, OE Remedial Actions have been implemented regularly in such areas for many years at the former Fort Ord, and could be successfully implemented using readily available trained personnel and equipment once the vegetation has been removed. Current estimates indicate OE Remedial Action at each of the IA sites could be completed before vegetation grows back to a level that would make OE Remedial Action hazardous. Initial removal of surface OE items is the only activity that must be performed within the timeframe before vegetation grows back to ensure OE worker safety. Based on past experience by the Army's OE contractor, surface removal can be

performed within the regrowth period of approximately one year for Site OE-16. Once surface OE has been removed, subsurface OE remedial operations can be performed as vegetation gradually grows back and would not disrupt digital geophysical surveys, excavation, and removal of subsurface OE items. The total duration of OE remedial activities for Site OE-16 is estimated at 2 months.

6.3.3.2.3 OE Detonation Alternatives

No Action would be the easiest OE Detonation Alternative to implement because it takes no further action to respond to risks associated with OE found during physical removal of OE. The Detonation with Engineering Controls Alternative would be easier to implement than the Detonation Chamber and Detonation with Engineering Controls Alternative because it consists of detonating any dangerous OE discovered during physical removal of OE in place or consolidating it nearby without having to handle or relocate the OE as would be required when using a detonation chamber. The Detonation Chamber and Detonation with Engineering Controls Alternative would be difficult to implement because it would require UXO be transported to the temporary chamber locations immediately within access gates to the site, which would significantly increase the potential for accidental detonation of UXO and associated risks to workers. In addition, the chamber can only be used for approximately 10 percent of the OE items anticipated to be found at Site OE-16, so its implementability is limited. Detonation with Engineering Controls has been implemented regularly in such areas for many years at Fort Ord, and could be successfully implemented using readily available trained personnel and equipment during the course of physical removal of OE.

6.3.3.3 Cost

Cost estimates have been prepared for each of the alternatives. Detailed cost estimate tables are included in Appendix C. The cost criterion examines both capital costs and annual operations and maintenance (O&M) costs for the alternatives. Capital costs include contingencies, engineering, and supervision costs. O&M costs include annual fixed costs such as site labor costs, monitoring costs, and maintenance costs for existing or enhanced site security measures. These cost estimates are primarily for comparative purposes. Actual costs to perform work may vary and will be, to a large extent, dependent upon the duration of the alternatives, and the actual extent of OE-related impacts discovered at each IA site. The cost estimates have an accuracy of +50 percent/-30 percent.

6.3.3.3.1 Vegetation Clearance Alternatives

Capital, O&M, and the total range of costs for each of the Vegetation Clearance Alternatives are summarized below.

Capital Costs

Capital costs for implementing Vegetation Clearance Alternatives range from $0 for the No Action Alternative to $288,000 for the Prescribed Burning Alternative (Table C17 of Appendix C), to $228,000 for the Mechanical Clearance Alternative (Table C18 of Appendix C), and $411,000 for the Manual Clearance Alternative (Table C19 of Appendix C).

O&M Costs

O&M costs for each of the Vegetation Clearance Alternatives were estimated over a monitoring period of five years assumed to be necessary to monitor the recovery of the habitat as specified in the HMP. Long-term O&M costs for monitoring after implementation of each of the Vegetation Clearance Alternatives range from $0 for the No Action Alternative to $30,000 for the Prescribed Burning, Mechanical, and

Manual Clearance Alternatives (Tables A17, A18, and A19 of Appendix C). These cost estimates do not include the cost to implement corrective measures such as active plantings and additional monitoring and reporting if the HMP success criteria are not met. The costs to repair damages caused to the CMC habitat areas would likely be significant if methods other than prescribed burning are used, which is the only method approved for vegetation clearance of CMC habitat found at the site for areas greater than 50 acres.

Total Costs

Total costs for the Vegetation Clearance Alternatives vary from $0 per acre ($0 total) for the No Action Alternative to $3,973 per acre ($318,000 total) for the Prescribed Burning Alternative (Table C17 of Appendix C), to $3,220 per acre ($ 258,000 total) for the Mechanical Clearance Alternative (Table C18 of Appendix C), to $5,516 per acre ($441,000 total) for the Manual Clearance Alternative (Table C19 of Appendix C) as shown in Appendix C and summarized in Table 8. Excluding the No Action Alternative, which has no costs, long-term O&M costs for monitoring the recovery of the habitat for a period of five years as specified in the HMP are included in the total costs.

6.3.3.3.2 OE Remedial Action Alternatives

Capital, O&M, and total costs for each of the OE Remedial Action Alternatives are summarized below. The cost estimates have an accuracy of +50 percent/-30 percent.

Capital Costs

Capital Costs for the OE Remedial Action Alternatives vary from $0 for the No Action with Existing Site Security Measures Alternative (Table C20 of Appendix C), to $412,000 for the Enhanced Site Security Measures Alternative (Table C21 of Appendix C), and $1.3 million for the Subsurface OE Removal Alternative (Table C22 of Appendix C) as shown in Appendix C and summarized in Table 8.

O&M Costs

O&M costs for the OE Remedial Action Alternatives are only applicable to the No Action with Existing Site Security Measures and Enhanced Site Security Measures Alternatives and were estimated for an interim period of 5 years until long term O&M needs are determined in the basewide OE RI/FS. A present worth analysis was used to evaluate expenditures that would occur for an interim period of 5 years until long term O&M needs are determined in the basewide OE RI/FS (i.e., O&M costs) by discounting all future costs to 2002, the base year for this report. This procedure allows the cost of the alternative to be compared on the basis of a single figure representing the amount of money that, if invested in 2002 and disbursed as needed, would be sufficient to cover all costs associated with the action over its planned life. In conducting the present worth analysis, the NPV was calculated for an interim period of 5 years until long term O&M needs are determined in the basewide OE RI/FS based on a 6.4 percent interest rate (Source: *Engineering News Record Cost Index for Construction, January 2002*). Long-term O&M costs were estimated at $35,000 for the No Action with Existing Site Security Measures Alternative (Table C20 of Appendix C) and $1.4 million for the Enhanced Site Security Measures Alternative (Table C21 of Appendix C). The Subsurface OE Removal

Alternative has no associated O&M costs.

Total Costs

Total costs for the OE Remedial Action Alternatives vary from $440 per acre ($35,000 total) for the No Action with Existing Site Security Measures Alternative (Table C20 of Appendix C), to $23,088 per acre ($1.8 million total) for the Enhanced Site Security Measures Alternative (Table C21 of Appendix C), and range from $16,230 to $16,254 per acre ($1.3 million total) for the Subsurface OE Removal Alternative (Table C22 of Appendix C) as shown in Appendix C and summarized in Table 8. Long-term O&M costs associated with the No Action with Existing Site Security Measures and Enhanced Site Security Measures Alternatives for a period of five years are included in the total costs.

6.3.3.3.3 OE Detonation Alternatives

Capital, O&M, and the total range of costs for each of the OE Detonation Alternatives are summarized below. The cost estimates have an accuracy of +50 percent/-30 percent.

Capital Costs

Capital costs for the OE Detonation Alternatives range from $0 for the No Action Alternative, to $13,000 for the Detonation with Engineering Controls Alternative (Table C23 of Appendix C), to $28,000 for the Detonation Chamber and Detonation with Engineering Controls Alternative (Table C24 of Appendix C).

O&M Costs

There are no O&M costs for the OE Detonation Alternatives.

Total Costs

Total costs for the OE Detonation Alternatives vary from $0 per acre ($0 total) for the No Action Alternative, to $157 per acre ($13,000 total) for the Detonation with Engineering Controls Alternative (Table C23 of Appendix C), to $344 per acre ($28,000 total) for the Detonation Chamber and Detonation with Engineering Controls Alternative (Table C24 of Appendix C) as shown in Appendix C and summarized in Table 8.

7.0 SELECTION OF THE PRELIMINARILY IDENTIFIED PREFERRED INTERIM ACTION ALTERNATIVES

This section presents the selection of the Preliminarily Identified Preferred Interim Action Alternatives for each of the IA sites based on the evaluation and comparison of alternatives presented in Section 6.0. These Preliminarily Identified Preferred Alternatives will undergo formal public review and regulatory agency approval through the IA RI/FS Proposed Plan and ROD process described in Section 8.0 and shown on Plate 11. The Preferred Interim Action Alternatives for each of the IA sites will be presented in the Proposed Plan and selected and documented in the ROD. Tables 6 through 8 present summaries and comparisons of the alternatives for each of the IA sites. Tables 9 through 11 present summaries of the Preliminarily Identified Preferred Interim Action Alternatives for each of the IA sites.

7.1 Ranges 43–48

The Preliminarily Identified Preferred Alternative selected for Ranges 43–48 consists of the three-tiered alternative described below and summarized in Table 9. A summary of the Interim Action Alternative follows the rationale presented for selection of each of the three-tiered alternatives.

Vegetation Clearance Alternative

Prescribed burning was selected as the Preliminarily Identified Preferred Vegetation Clearance Alternative for Ranges 43–48. The No Action Alternative is not effective in clearing vegetation, and the manual or mechanical methods would:

- Not achieve the same degree of vegetation clearance as burning.
- Not be conducted in compliance with the substantive elements of ARARs (the HMP and ESA).
- Take much longer to clear the ranges than burning.
- Not access rugged terrain areas or would be difficult to implement in these areas.
- Not be as protective of workers because they could come in contact with UXO while cutting (burning would be conducted remotely from areas being cleared).
- Not promote the health and functioning of the habitat to the same degree as burning.
- Can only be implemented in limited areas because of restrictions on the use of these methods as outlined in the HMP.
- Costs for Prescribed Burning ($1.9 million) are only slightly higher than for Mechanical Methods ($1.6 million), and are less than for Manual Methods ($2.8 million). There are no costs associated with No Action, which is the least effective.

OE Remedial Action Alternative

Subsurface OE Removal was selected as the Preliminarily Identified Preferred OE Remedial Action Alternative for Ranges 43–48 because, although its cost is much higher than the other two alternatives:

- The No Action with Existing Site Security Measures Alternative would not be effective at removing the physical threat associated with the presence of OE in areas that may be accessed by the public.
- The Enhanced Site Security Measures Alternatives would not be as effective as the Subsurface OE Removal Alternative at removing the physical threat associated with the presence of OE in areas that may be accessed by the public, and Enhanced Site

Security Measures would only increase access limitations that have already been breached by the public at these ranges.

- Under the Subsurface OE Removal Alternative, the Army intends to conduct OE Remedial Action to identify, investigate and remove all UXO/OE found to remove the physical threat associated with the presence of OE that may be accessed by the public.

- Although costs for Subsurface OE Removal ($10.6 to $11.2 million) are higher than for Enhanced Site Security Measures ($4.5 million) and No Action with Existing Site Security Measures ($235,000), these methods would not be as effective in minimizing OE risks.

OE Detonation Alternative

The Detonation with Engineering Controls Alternative was selected as the Preliminarily Identified Preferred OE Detonation Alternative because:

- The No Action Alternative is not effective in reducing hazards associated with UXO

- The Detonation with Engineering Controls Alternative would achieve the same degree of hazard reduction as the Detonation Chamber and Detonation with Engineering Controls Alternative, and the detonation chamber can only be used on approximately 5 percent of the OE items anticipated to be found at Ranges 43-48

- The Detonation with Engineering Controls Alternative is a proven and flexible method used at Fort Ord over many years that is considered safe for detonating any type of OE found at the ranges

- The chamber can only be used for transportable OE items that are 81mm or less in diameter, and would require additional handling to transport items to temporary chamber locations immediately within access gates to the site, and only 5 percent of these types of items are anticipated to be safe for transport to the chamber

- The Detonation with Engineering Controls Alternative can be implemented immediately as OE is discovered over the course of physical removal of OE, and can be applied in-place or transferred with other OE items and detonated in consolidation shots

- Use of a detonation chamber would require OE at the ranges to be handled, moved, and stored/stockpiled prior to its operation, which would greatly increase safety hazards to workers associated with accidental detonation of OE

- Costs for Detonation with Engineering Controls and Detonation Chamber and Detonation with Engineering Controls are $1.1 million. There are no costs associated with No Action, which is the least effective alternative.

7.1.1 Summary of the Preliminarily Identified Preferred Interim Action Alternative for Ranges 43–48

The Preliminarily Identified Preferred Interim Action Alternative for Ranges 43–48 includes:

- Vegetation Clearance via Prescribed Burning

- OE Remedial Action via Subsurface OE Removal

- OE Detonation via Detonation with Engineering Controls.

These alternatives are the most successful in meeting the Interim Action evaluation criteria categorized in terms of effectiveness, implementability, and cost. Prescribed Burning, Subsurface OE Removal, and Detonation with

Engineering Controls are each the most effective and implementable of the alternatives considered as described above. The total cost of the Preliminarily Identified Preferred Alternative for Ranges 43-48 is estimated to range from $13.6 to $14.2 million as summarized in Table 9. The range of costs was controlled by three factors: (1) the duration of Vegetation Clearance Method, (2) the extent to which the OE Remedial Action mitigates OE risks, and (3) whether OE Detonation is performed using engineering controls alone or in combination with a detonation chamber.

7.2 Range 30A

The Preliminarily Identified Preferred Alternative selected for Range 30A consists of the three-tiered alternative described below and summarized in Table 10. A summary of the Interim Action Alternative follows the rationale presented for selection of each of the three-tiered alternatives.

Vegetation Clearance Alternative

Prescribed burning was selected as the Preliminarily Identified Preferred Vegetation Clearance Alternative for Range 30A. The No Action Alternative is not effective in clearing vegetation, and the manual or mechanical methods would:

- Not achieve the same degree of vegetation clearance as burning.
- Not be conducted in compliance with the substantive elements of ARARs (the HMP and ESA).
- Take much longer to clear the range than burning.
- Not access rugged terrain areas or would be difficult to implement in these areas.
- Not be as protective of workers because they could come in contact with UXO while cutting (burning would be conducted remotely from areas being cleared).
- Not promote the health and functioning of the habitat to the same degree as burning.
- Cutting can only be implemented in limited areas because of restrictions on the use of these methods as outlined in the HMP.
- Costs for Prescribed Burning ($1.5 million) are slightly higher than for Mechanical Methods ($1.2 million), and lower than Manual Methods ($2.1 million). There are no costs associated with No Action, which is the least effective of the alternatives.

OE Remedial Action Alternative

Subsurface OE Removal was selected as the Preliminarily Identified Preferred OE Remedial Action Alternative for Range 30A because, although its cost is much higher than the other two alternatives:

- The No Action with Existing Site Security Measures Alternative would not be effective at removing the physical threat associated with the presence of OE in areas that may be accessed by the public
- The Enhanced Site Security Measures Alternatives would not be as effective as the Subsurface OE Removal Alternative at removing the physical threat associated with the presence of OE in areas that may be accessed by the public, and Enhanced Site Security Measures would only increase access limitations that have already been breached by the public at this range
- Under the Subsurface OE Removal Alternative, the Army intends to conduct OE Remedial Actions to identify, investigate and remove all UXO/OE found to remove the physical threat associated with the presence of OE in areas that may be accessed by the public
- Although costs for Subsurface OE Removal ($6.8 to $7.7 million) are higher than for Enhanced Site Security Measures ($4.2 million) and No Action with Existing

Site Security Measures ($164,000), these methods would not be as effective in minimizing OE risks.

OE Detonation Alternative

The Detonation with Engineering Controls Alternative was selected as the Preliminarily Identified Preferred OE Detonation Alternative because:

- The No Action Alternative is not effective in reducing hazards associated with UXO
- The Detonation with Engineering Controls Alternative would achieve the same degree of hazard reduction as the Detonation Chamber and Detonation with Engineering Controls Alternative, and the detonation chamber can only be used on approximately 10 percent of the OE items anticipated to be found at Range 30A
- The Detonation with Engineering Controls Alternative is a proven and flexible method used at Fort Ord over many years that is considered safe for detonating any type of OE found at the ranges
- The chamber can only be used for transportable OE items that are 81mm or less in diameter, and would require additional handling of UXO to transport items to temporary chamber locations immediately within access gates to the site
- The Detonation with Engineering Controls Alternative can be implemented immediately as OE is discovered over the course of physical removal of OE, and can be applied in-place or transferred with other OE items and detonated in consolidation shots
- Use of a detonation chamber would require OE at the ranges to be handled, moved, and stored/stockpiled prior to its operation, which would greatly increase safety hazards to workers associated with accidental detonation of OE
- Costs for Detonation with Engineering Controls ($124,000) are comparable to those for Detonation Chamber and Detonation with Engineering Controls ($136,000). There are no costs associated with No Action, which is the least effective alternative.

7.2.1 Summary of the Preliminarily Identified Preferred Interim Action Alternative for Range 30A

The Preliminarily Identified Preferred Interim Action Alternative for Range 30A includes:

- Vegetation Clearance via Prescribed Burning
- OE Remedial Action via Subsurface OE Removal
- OE Detonation via Detonation with Engineering Controls.

These alternatives are the most successful in meeting the Interim Action evaluation criteria categorized in terms of effectiveness, implementability, and cost. Prescribed Burning, Subsurface OE Removal, and Detonation with Engineering Controls are each the most effective and implementable of the alternatives considered as described above. The total cost of the Preliminarily Identified Preferred Alternative for Range 30A is estimated to range from $8.3 to $9.3 million as summarized in Table 10. The range of costs was controlled by three factors: (1) the duration of Vegetation Clearance Method, (2) the extent to which the OE Remedial Action mitigates OE risks, and (3) whether OE Detonation is performed using engineering controls alone or in combination with the detonation chamber.

7.3 Site OE-16

The Preliminarily Identified Preferred Alternative selected for Site OE-16 consists of

the three-tiered alternative described below and summarized in Table 11. A summary of the Interim Action Alternative follows the rationale presented for selection of each of the three-tiered alternatives.

Vegetation Clearance Alternative

Prescribed burning was selected as the Preliminarily Identified Preferred Vegetation Clearance Alternative for Site OE-16. The No Action Alternative is not effective in clearing vegetation, and the manual or mechanical methods would:

- Not achieve the same degree of vegetation clearance as burning.
- Not be conducted in compliance with the substantive elements of ARARs (the HMP and ESA).
- Take much longer to clear the site than burning.
- Not access rugged terrain areas or would be difficult to implement in these areas.
- Not be as protective of workers because they could come in contact with UXO while cutting (burning would be conducted remotely from areas being cleared).
- Not promote the health and functioning of the habitat to the same degree as burning.
- Cutting can only be implemented in limited areas because of restrictions on the use of these methods as outlined in the HMP.
- Costs for Prescribed Burning ($318,000) are only slightly higher than for Mechanical Methods ($258,000), and are less than for Manual Methods ($441,000). There are no costs associated with No Action, which is the least effective alternative.

OE Remedial Action Alternative

The Subsurface OE Removal Alternative was selected as the Preliminarily Identified Preferred OE Remedial Action Alternative for Site OE-16 because, although its cost is much higher than the other two alternatives:

- The No Action with Existing Site Security Measures Alternative would not be effective at removing the physical threat associated with the presence of OE in areas that may be accessed by the public
- The Enhanced Site Security Measures Alternatives would not be as effective as the Subsurface OE Removal Alternative at removing the physical threat associated with the presence of OE in areas that may be accessed by the public, and Enhanced Site Security Measures would only increase access limitations that have already been breached by the public at this site
- Under the Subsurface OE Removal Alternative, the Army intends to conduct OE Remedial Actions at each of the IA sites to identify, investigate and remove all UXO/OE found to remove the physical threat associated with the presence of OE in areas that may be accessed by the public
- Costs for Subsurface OE Removal ($1.3 million) are lower than for Enhanced Site Security Measures ($1.8 million), and higher than No Action with Existing Site Security Measures ($35,000); however, these methods would not be as effective in minimizing OE risks.

OE Detonation Alternative

The Detonation with Engineering Controls Alternative was selected as the Preliminarily Identified Preferred OE Detonation Alternative because:

- The No Action Alternative is not effective in reducing hazards associated with UXO.

- The Detonation with Engineering Controls Alternative would achieve the same degree of hazard reduction as the Detonation Chamber and Detonation with Engineering Controls Alternative, and the detonation chamber can only be used on approximately 10 percent of the OE items anticipated to be found at Site OE-16.

- The Detonation with Engineering Controls Alternative is a proven and flexible method used at Fort Ord over many years that is considered safe for detonating any type of OE found at the ranges.

- The chamber can only be used for transportable OE items that are 81mm or less in diameter, and would require additional handling of items during transport to temporary chamber location immediately within access gates to the site.

- The Detonation with Engineering Controls Alternative can be implemented immediately as OE is discovered over the course of physical removal of OE, and can be applied in-place or transferred with other OE items and detonated in consolidation shots.

- Use of a detonation chamber would require OE at the ranges to be handled, moved, and stored/stockpiled prior to its operation, which would greatly increase safety hazards to workers associated with accidental detonation of OE.

- Costs for Detonation with Engineering Controls ($13,000) are comparable to those for Detonation Chamber and Detonation with Engineering Controls ($28,000). There are no costs associated with No Action, which is the least effective alternative.

7.3.1 Summary of the Preliminarily Identified Preferred Interim Action Alternative for Site OE-16

The Preliminarily Identified Preferred Interim Action Alternative for Site OE-16 includes:

- Vegetation Clearance via Prescribed Burning

- OE Remedial Action via Subsurface OE Removal

- OE Detonation via Detonation with Engineering Controls.

Prescribed Burning, Subsurface OE Removal, and Detonation with Engineering Controls are each the most effective and implementable of the alternatives considered as described above. The total cost of the Preliminarily Identified Preferred Alternative for Site OE-16 is estimated at $1.6 million as summarized in Table 11. The range of costs was controlled by three factors: (1) the duration of Vegetation Clearance Method, (2) the extent to which the OE Remedial Action mitigates OE risks, and (3) whether OE Detonation is performed using engineering controls alone or in combination with the detonation chamber.

8.0 INTERIM ACTION APPROVAL PROCESS

This section presents a summary of the approval process that will be followed for Interim Action at the IA sites, including a description of the IA RI/FS Proposed Plan and Record of Decision (ROD), and Community Relations activities related to the approval process. An Implementation Process Flow Chart for Interim Action is shown on Plate 11. Responses to Comments on the Draft Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study for Ranges 43-48, Range 30A, Site OE-16 (Draft IA RI/FS), Former Fort Ord, California, October 23, 2001 are presented in Appendix D. This Draft Final IA RI/FS has been revised as indicated in Appendix D based on comments received on the Draft IA RI/FS.

8.1 Interim Action Proposed Plan

The Preliminarily Identified Preferred Alternatives for the Interim Action sites will be presented to the public in the IA RI/FS Proposed Plan. The Proposed Plan will briefly summarize the alternatives considered in the IA RI/FS, highlighting the key factors that led to the selection of the Preferred Alternatives. The Proposed Plan, the IA RI/FS, and other support documents that form the basis for the Army's Preferred Alternative selections will be made available for public review in the Fort Ord Administrative Record, the local repositories and on the Fort Ord web page (www.fortordcleanup.com). There will be a 30-day public comment period for the IA RI/FS Proposed Plan. There will be an opportunity for a public meeting during the 30-day public comment period as required by the National Contingency Plan (NCP).

8.2 Interim Action Record of Decision (ROD)

After consideration of public and final regulatory agency comments on the Proposed Plan, the Army will select and document the final interim action remedy decisions for each site which is approved by the EPA and DTSC, in an Interim Action ROD. The ROD documents the remedial action for each site and serves the following functions:

- It certifies that the remedy selection was carried out in accordance with CERCLA
- It describes the technical parameters of the remedy, specifying the methods selected to protect human health and the environment
- It provides the public with a consolidated summary of information for the IA sites, the chosen remedies, and the rationales for the remedy selection
- It documents the Army's responses to comments made to the Proposed Plan.

The Interim Action ROD must be followed by a final ROD. The final ROD will describe how the selected remedy will provide for the long-term protection of human health and the environment, and fully address the threats posed by OE at the IA sites.

8.3 Community Relations

Community relations activities for the IA RI/FS are intended to facilitate community participation in the decision process, keep communities informed of OE-related activities at the former Fort Ord relating to the Interim Action, and help supporting agencies respond to community concerns. Community relations plan (CRP) activities for the overall OE program are described in the *Community Relations Plan Update Number 2, Fort Ord, California* (*Army, 2001*). In November 1998, the Army agreed to evaluate UXO at Fort Ord in a basewide OE RI/FS. Although the CRP was created to address community relations for the overall Environmental Cleanup to include the

OE program prior to the initiation of the basewide OE RI/FS, the content of the CRP is still applicable and valid for basewide OE RI/FS activities and is updated on an annual basis. The CRP describes the community relations program that will be used during the basewide OE RI/FS process. The CRP is updated annually to implement/document CERCLA community relation requirements and program activities.

The CRP outlines communication techniques that will be used to keep the affected community informed throughout the OE Remedial Action and overall basewide OE RI/FS process. The basewide OE RI/FS will include a summary of community relations activities conducted during the planning and document preparation phases of the basewide OE RI/FS process; these activities will be conducted in keeping with the community relations program outlined in the CRP. Public participation activities, including educational programs and brochures, fact sheets, public notices, and press releases, related to OE sites at Fort Ord have been conducted to date in accordance with CERCLA.

The following sections summarize the approach outlined for community relations activities in the CRP that will be used during the IA RI/FS process.

8.3.1 Community Involvement

Community includes elected officials and public agencies; on-base and nearby businesses and residents; employees of the Installation; environmental and special interest groups; those with an interest in the activities associated with the Installation in the past; and those who are interested in future uses of the area. The CRP includes a profile of the community surrounding Fort Ord, a chronology of community involvement, and a description of the community's continuing involvement in the planning and implementation to be used in the IA RI/FS process.

Continuing community involvement will be achieved through a combination of newspaper notices, articles, fact sheets, presentations, community involvement workshops, public meetings, and tours.

8.3.2 Community Relations Strategy

Implementation of community relations for the IA RI/FS will focus on involving the community in the decision making process and providing information regarding the types of UXO found at IA sites on Fort Ord, the timeline for and reporting and scheduling of IA RI/FS activities, and potential hazards associated with the presence of OE. The Army will endeavor to achieve the following in conjunction with the regulatory agencies involved in the IA RI/FS process:

1. Enlist support of neighborhood representatives and local officials
2. Ensure a steady flow of information to and from stakeholders (i.e., local communities and their members affected by the base closure and IA RI/FS process)
3. Provide timely and accurate information concerning OE actions to the community
4. Keep the media informed about IA RI/FS activities
5. Provide regular updates to interested community members
6. Maintain the availability of information to community members through accessible information repositories and the web page (www.fortordcleanup.com)
7. Implement Environmental Justice Executive Order 12898. Provide announcements, fact sheets, and convenient information locations to inform minority community groups based on an evaluation of the ethnic makeup and predominant language used within significantly represented minority groups. Provide translation of cleanup information upon request.

8.3.3 Implementation of Community Relations Activities

The CRP contains a detailed description of the responsibilities of various parties in implementing community relations activities. The Army is committed to providing information about the IA RI/FS on a continuing basis to interested community members and groups under the framework described in the CRP.

Specific community relations activities related to conducting the IA RI/FS include:

- Providing orientation for organizations, agencies, and groups
- Mailing fact sheets regarding significant IA RI/FS milestones to community members who have requested to be on the community relations mailing list
- Publishing public notices in local newspapers and providing press releases to radio and television media announcing the availability of IA RI/FS–related documents and opportunities for public comment
- Responding to comments and inquiries from the community on IA RI/FS–related documents
- Soliciting media coverage, providing updates, and publishing advertisements related to IA RI/FS-related activities
- Including updates related to the IA RI/FS in the *Fort Ord NEWS*, a quarterly newsletter that addresses environmental cleanup issues at Fort Ord and is mailed to local residents and interested parties
- Updating local officials and neighborhood associations on the IA RI/FS process
- Providing a technical point of contact for all community inquiries regarding the IA RI/FS
- Maintaining IA RI/FS-related documents in the information repositories and Administrative Record
- Conducting workshops and public meetings at appropriate milestones in the IA RI/FS process
- Providing a 30-day public comment period for the Proposed Plan
- Providing an opportunity for a public meeting during the 30-day public comment period and providing a responsiveness summary in the ROD.

8.3.4 State and Local Authorities' Roles

State and local government cooperation has been achieved through DTSC as the State point of contact and has included regulatory agency involvement during the development of the IA RI/FS at the former Fort Ord. The Army continues to conduct the OE response, inform state and local agencies of progress related to OE investigations and remedial actions, and accept and respond to state and local agency input regarding implementation of those actions and conducting the basewide OE RI/FS.

9.0 REFERENCES

California Department of Fish and Game (CDFG), 1997. *List of California Terrestrial Natural Communities Recognized by the National Diversity Data Base*. December.

Christensen, N., and C. Muller, 1975. *Relative Importance of Factors Controlling Germination and Seedling Survival in* Adenostoma *Chaparral*. American Midland Naturalist. 93: 71-78.

Fort Ord Reuse Authority (FORA), 1997. *Fort Ord Base Reuse Plan*. March.

Geotechnical Consultants, Inc., (GTC), 1984. *Hydrogeological Update, Fort Ord Military Reservation and Vicinity*. Prepared for Sacramento USACE. October.

Harding ESE, Inc. (Harding ESE, formerly Harding Lawson Associates [HLA]), 1992. *Draft Basewide Biological Inventory, Fort Ord, California*. December 9.

_____, 1994a. *Draft Final Data Summary and Work Plan, Site 39 – Inland Ranges, Fort Ord, California.* Prepared for USACE. May.

_____, 1994b. *Annual Monitoring Report for Biological Baseline Studies at Unexploded Ordnance Sites.* Prepared for USACE. December.

_____, 1995a. *Final Basewide Remedial Investigation/Feasibility Study, Fort Ord, California*. Prepared for USACE. October.

_____, 1995b. *1995 Annual Biological Monitoring Report for Unexploded Ordnance Removal Sites at Former Fort Ord.* Prepared for USACE.

_____, 1996. *Annual Monitoring Report, Biological Baseline Studies and Follow-up Monitoring at Unexploded Ordnance Sites 10 East, 10 West, 11, 12, and 16, Presidio of Monterey Annex, Monterey, California.* December 12.

_____, 1997. *Annual Habitat Report, Former Fort Ord, Monterey County, California*. December 24.

_____, 1998. *Annual Monitoring Report, Biological Baseline Studies and Follow-up Monitoring at Unexploded Ordnance Sites on Former Fort Ord, Presidio of Monterey Annex, Monterey, California*. December 10.

_____, 1999a. *Draft Report of Quarterly Monitoring, January through March 1999, Fort Ord, California*. July 27.

_____, 1999b. *Annual Monitoring Report, Biological Baseline Studies and Follow-up Monitoring at Unexploded Ordnance Sites on Former Fort Ord, Presidio of Monterey Annex, Monterey,* California. December 2.

_____, 2000a. *Annual Monitoring Report, Biological Baseline Studies and Follow-up Monitoring at Unexploded Ordnance Sites on Former Fort Ord, Presidio of Monterey Annex, Monterey, California*. January 19.

_____, 2000b. *Final Ordnance Detonation Sampling and Analysis Plan, Former Fort Ord, Monterey, California*. October.

_____, 2001a. *Annual Monitoring Report, Biological Baseline Studies and Follow-up Monitoring at Unexploded Ordnance Sites on Former Fort Ord, Presidio of Monterey Annex, Monterey, California*. May.

_____, 2001c. *Technical Memorandum, Air Emissions from Incidental Ordnance Detonation During a Prescribed Burn on Ranges 43-48, Former Fort Ord, Monterey, California*. November 9.

Monterey County Planning Department (MCPD), 1984. *Greater Monterey Peninsula Area Plan* (Part of the Monterey County General Plan). Prepared for Monterey County.

Muller, C., 1966. *The Role of Chemical Inhibition (Allelopathy) in Vegetational Composition.* Bulletin of the Torrey Botanical Club. 93: 332-351.

Staal, Gardner & Dunne, Inc. (SGD), 1987. *Hydrogeologic Investigation, Seaside Coastal Groundwater Basin, Monterey County, California*. Prepared for Monterey Peninsula Water Management District. May.

U.S. Army (Army), 1994. *Fort Ord Ordnance and Explosive Waste Time-Critical Removal Action Memorandum, Former Fort Ord, Monterey County, California.* Final. September.

_____, 1997. *Engineering Evaluation/Cost Analysis – Phase 1, Former Fort Ord, Monterey County, California.* Final. September.

_____, 1998a. *Final Action Memorandum 1, Twelve Sites, Phase 1 Engineering Evaluation/Cost Analysis, Ordnance and Explosives Sites, Former Fort Ord, Monterey County, California*. January 23.

_____, 1998b. *Correspondence from Mr. Willison, Director, Environmental and Natural Resources Management, Department of the Army, Defense Language Institute and Presidio of Monterey, Presidio of Monterey County, California, to USFWS*. February 2.

_____, 1998c. *Engineering Evaluation/Cost Analysis – Phase 2, Former Fort Ord, Monterey County, California*. Final. April.

_____, 1999. *Final Action Memorandum, Phase 2 Engineering Evaluation/Cost Analysis, Ordnance and Explosives Sites*. Former Fort Ord, Monterey County, California.

_____, 2000. *Correspondence from Mr. Willison, Director, Environmental and Natural Resources Management, Department of the Army, Defense Language Institute and Presidio of Monterey, Presidio of Monterey County, California, to USFWS*. November 6, December 21.

_____, 2001a. *Community Relations Plan Update Number 2, Fort Ord, California*. January.

_____, 2001b. Army (United States Department of the Army) *Ordnance and Explosives Site Security Program Summary, Former Fort Ord, California*. March.

U.S. Army Design Engineering and Support Center, Huntsville (USAEDH), 1993. *Archives Search Report. Fort Ord, California, Monterey County, California*. Prepared by U.S. Army Corps of Engineers, St. Louis District. December.

_____, 1994. *Archives Search Report* (*Supplement No. 1*). *Fort Ord, California, Monterey California.* Prepared by U.S. Army. Corps of Engineers, St. Louis District. November

_____, 1997. *Draft Revised Archives Search Report, Former Fort Ord, California. Monterey County, California*. Prepared by U.S. Army Corps of Engineers, St. Louis District.

U.S. Army Corps of Engineers (USACE)—Sacramento District, 1994. With technical assistance from Jones and Stokes, Associates. *Fort Ord 1994 Annual Monitoring Report for Biological Baseline Studies at Unexploded Ordnance Sites*. January.

_____, 1995. *USACE and Bureau of Land Management* (*BLM*) *Site Use Management Plan* (*SUMP*). July.

_____, 1997. *Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California* (*HMP*). April. With technical assistance form Jones and Stokes Associates, Sacramento, California.

_____, 2000. *Draft Final Ordnance and Explosives, Remedial Investigation/Feasibility Study Work Plan*. Former Fort Ord, Monterey County, California. May.

_____, 2001. *Ordnance Detection and Discrimination Study, Former Fort Ord, California*. Draft Report. August.

U.S. Department of Defense (DoD), 2000. *Closed, Transferred, and Transferring Ranges Containing Military Munitions; Proposed Rule [Range Rule]*. Federal Register.

U.S. Environmental Protection Agency (EPA), 1988. *Guidance for Conducting Remedial Investigation/Feasibility Studies Under CERCLA*. Interim Final. EPA 540/G-89/001. October.

_____, 1993. EPA. *Guidance for Development of Applicable or Relevant and Appropriate Requirements Under CERCLA, EPA 580-I-94-007*.

_____, 1999. EPA. *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents*, EPA 540-R-98-031, July.

United States Department of the Interior, Fish and Wildlife Service (USFWS), 1993. *Biological Opinion for the Disposal and Reuse of Fort Ord, Monterey County, California*. (I-8-93-F-14). October 19.

_____, 1997. *Biological and Conference Opinion for the Disposal and Reuse of Fort Ord, Monterey County, California*.

_____, 1997. *Controlled Burning Program at the Former Fort Ord, Monterey County, California*. October 9.

_____, 1998. *Proposed Changes in Ordnance and Explosives Removal at the Former Fort Ord, Monterey County, California*. March 16.

_____, 1999. *Biological and Conference Opinion on the Closure and Reuse of Fort Ord, Monterey County, California*. (I-8-99-F/C-39R). March 30.

_____, 2000. *Biological and Conference Opinion on the Closure and Reuse of Fort Ord, Monterey County, California*. (I-8-99-F/C-39R). September 29.

_____, 2001. *Correspondence to Mr. Willison, Director, Environmental and Natural Resources Management, Department of the Army, Defense Language Institute and Presidio of Monterey, Presidio of Monterey County, California*. January 31.

Wright, E., 1931. *The Effect of High Temperature on Seed Germination.* Journal of Forestry. 29: 679-687.

TABLES

Table 1. Habitat Management Plan Species in Habitat Areas
Interim Action Ordnance and Explosives
Remedial Investigation/Feasibility Study
Former Fort Ord, California

Species		Listing Status[1] [Fed/State/Other]	CNPS Red Code[2]	Occurrence[3]	Reference[4]
Common Name	**Scientific Name**				
Plants					
Sandmat Manzanita	*Arctostaphylos pumila*	FSC/--/1B	3,2,3	K	2000 Surveys
Monterey ceanothus	*Ceanothus cuneatus rigidus*	FSC/--/4	1,2,3	K	2000 Surveys
Monterey spineflower	*Chorizanthe p. pungens*	FT/--/1B	2,2,3	K	2000 Surveys
Seaside Bird's-beak	*Cordylanthus rigidus littoralis*	FSC/SE/1B	2,3,3	K	2000 Surveys
Eastwood's ericameria	*Ericameria fasciculata*	FSC/--/1B	3,3,3	K	2000 Surveys
Sand Gilia	*Gilia tenuiflora arenaria*	FE/ST/1B	3,2,3	K	2000 Surveys
Animals					
California Black Legless Lizard	*Anniella pulchra nigra*	--/CSC/--	NA	P	
Monterey ornate shrew (Salinas)	*Sorex ornatus salarius*	FSC/CSC/--	NA	P	

[1] **Listing Status:**

Federal

FE	Federally listed as endangered
FT	Federally listed as threatened
FSC	Federal species of concern

State

SE	State listed as endangered
ST	State listed as threatened
CSC	State species of special concern

CNPS (California Native Plant Society) List

1B	Rare or endangered in California and elsewhere
4	Plants of limited distribution (Watch list)

[2] **CNPS RED Code**

R (Rarity)

1	Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time
2	Distributed in a limited number of occurrences, occasionally more if each occurrence is small
3	Distributed in one to several highly restricted occurrences, or present in such small numbers that it is seldom reported

Table 1. Habitat Management Plan Species in Habitat Areas
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Species		Listing Status[1] [Fed/State/Other]	CNPS Red Code[2]	Occurrence[3]	Reference[4]
Common Name	**Scientific Name**				

E (Endangerment)
- 1 Not endangered
- 2 Endangered in a portion of its range
- 3 Endangered throughout its range

D (Distribution)
- 1 More or less widespread outside California
- 2 Rare outside California
- 3 Endemic to California

[3] **Occurrence**
- K Species is known to occur based on past observations.
- P Species has the potential to occur based on habitat requirements and known range of species.

[4] **Reference**

2000 Annual Report, Biological Baseline Studies and Follow-up Monitoring, Former Fort Ord, Monterey County, California (*Harding ESE, 2001*).

Abbreviations

ARAR	Applicable or relevant and appropriate requirements.
EPA	Environmental Protection Agency.
et seq.	And following.
OE	Ordnance and Explosives.
U.S.C.	United States Code.
UXO	Unexploded Ordnance.

Table 2. Ranges 43 through 48, UXO and OE Scrap Discovered During Investigations
Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord, California
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Site Number	Grid Number	Depth (Inches)	QTY	Ordnance	Status
MRA Grid Sampling					
OE-15B	G 14	-12	1	MISSILE, GUIDED, HEAT, M222 (DRAGON) LIVE	UXO
OE-15B	G 14	-12	1	PROJECTILE, 81mm, MORTAR, SMOKE, WP, M57 LIVE	UXO
OE-15A	G 02 RNG 46	-3	18	ROCKET, PRACTICE, 3.5 INCH, M29A2 EXPENDED	OE Scrap
OE-15A	G 02 RNG 46	-4	21	ROCKET, PRACTICE, 3.5 INCH, M29A2 EXPENDED	OE Scrap
OE-15A	G 02 RNG 46	-4	23	ROCKET, PRACTICE, 3.5 INCH, M29A2 EXPENDED	OE Scrap
OE-15A	G 02 RNG 46	-4	14	ROCKET, PRACTICE, 3.5 INCH, M29A2 EXPENDED	OE Scrap
OE-15A	G 02 RNG 46	-2	10	ROCKET, PRACTICE, 3.5 INCH, M29A2 EXPENDED	OE Scrap
OE-15A	G 01 RNG 46	-5	61	PROJECTILE, 40mm, PRACTICE, M382 EXPENDED	OE Scrap
Road Clearance					
OE-15	MAVERICK ROAD 55-57	-12	2	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43A1 LIVE	UXO
OE-15	MAVERICK ROAD 57-59	-4	1	PROJECTILE, 57mm, HE, M306 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 55-57	0	2	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 35-37	0	14	ROCKET, 3.5 INCH, PRACTICE, M29A2 EXPENDED	OE Scrap
OE-15	MAVERICK ROAD 35-37	-12	1	ROCKET, 3.5 INCH, PRACTICE, M29A2 EXPENDED	OE Scrap
OE-15	MAVERICK ROAD 55-57	-6	2	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43A1 LIVE	UXO
OE-15	MAVERICK ROAD 27-29	0	37	ROCKET, 3.5 INCH, PRACTICE, M29A2 EXPENDED	OE Scrap
OE-15	MAVERICK ROAD 29-31	0	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 29-31	0	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 LIVE	UXO
OE-15	MAVERICK ROAD 27-39	0	2	FUZE, ROCKET, M404 LIVE	UXO
OE-15	MAVERICK ROAD 89-91	-2	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 37-39	-12	1	ROCKET, 3.5 INCH, PRACTICE, M29A2 EXPENDED	OE Scrap
OE-15	MAVERICK ROAD 49-51	-12	6	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43A1 LIVE	UXO
OE-15	MAVERICK ROAD 27-29	-8	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 79-81	-12	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 75-77	-18	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 51-53	-12	3	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43A1 LIVE	UXO
OE-15	MAVERICK ROAD 57-59	-4	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 57-59	-12	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 35-37	-8	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 49-51	-6	3	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 51-53	-12	1	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43A1 LIVE	UXO
OE-15	MAVERICK ROAD 49-51	-12	1	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43A1 EXPENDED	OE Scrap
OE-15	MAVERICK ROAD 67-69	-12	3	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43A1 LIVE	UXO
OE-15	MAVERICK ROAD 49-49	-12	2	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 47-49	-24	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 35-37	-4	1	PROJECTILE, 4.2 INCH, MORTAR, HE, M3A1 & M3 LIVE	UXO
OE-15	MAVERICK ROAD 83-85	-6	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 51-53	-12	1	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43A1 EXPENDED	OE Scrap

Table 2. Ranges 43 through 48, UXO and OE Scrap Discovered During Investigations
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Site Number	Grid Number	Depth (Inches)	QTY	Ordnance	Status
OE-15	MAVERICK ROAD 49-49	0	1	PROJECTILE, 84mm, HEAT, M136 (AT4) LIVE	UXO
OE-15	MAVERICK ROAD 45-47	-6	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 75-77	-12	2	PROJECTILE, 60mm, MORTAR, TARGET PRACTICE, M50A3 LIVE	UXO
OE-15	MAVERICK ROAD 83-85	-12	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 73-75	-12	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 73-75	-18	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 79-81	-18	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 87-89	-10	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 35-37	-6	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 87-89	-8	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15	MAVERICK ROAD 91-93	-6	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15	MAVERICK ROAD 35-37	-6	1	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43A1 LIVE	UXO
OE-15	MAVERICK ROAD 35-37	-17	1	PROJECTILE, 4.2 INCH, MORTAR, HE, M3A1 & M3 LIVE	UXO
OE-15	MAVERICK ROAD 45-47	-6	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 51-53	-6	4	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43A1 LIVE	UXO
OE-15	MAVERICK ROAD 73-75	-18	4	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 53-55	-6	4	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43A1 LIVE	UXO
OE-15	MAVERICK ROAD 47-49	0	1	MINE, ANTI-PERSONNEL, M-18A1, CLAYMORE LIVE	UXO
OE-15	MAVERICK ROAD 73-75	-24	22	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43A1 LIVE	UXO
OE-15	MAVERICK ROAD 73-75	-18	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 75-77	-6	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 35-37	-12	1	PROJECTILE, 81mm, MORTAR, HE, M362 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 73-75	-24	14	PROJECTILE, 60mm, MORTAR, TARGET PRACTICE, M50A3 LIVE	UXO
OE-15	MAVERICK ROAD 35-37	-12	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 73-75	-12	1	PROJECTILE, 75mm, HE, M48 LIVE	UXO
OE-15	MAVERICK ROAD 73-75	-6	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 73-75	-6	17	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15	MAVERICK ROAD 77-79	-9	2	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 77-79	-2	1	PROJECTILE, 81mm, MORTAR, HE, M362 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 61-63	-12	2	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 75-77	-6	2	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 35-37	-8	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 75-77	-24	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 77-79	-12	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 77-79	-6	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 79-81	-8	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 75-77	-6	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 77-79	-1	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 89-91	-12	1	PROJECTILE, 57mm, HE, M306 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 57-59	-13	1	PROJECTILE, 105mm, ILLUMINATING, M314 SERIES EXPENDED	OE Scrap
OE-15	MAVERICK ROAD 91-93	-12	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 63-65	-6	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 77-79	-6	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 73-75	-6	1	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43A1 LIVE	UXO

Table 2. Ranges 43 through 48, UXO and OE Scrap Discovered During Investigations
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Site Number	Grid Number	Depth (Inches)	QTY	Ordnance	Status
OE-15	MAVERICK ROAD 45-47	-8	2	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 87-89	-12	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15	MAVERICK ROAD 75-77	-12	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 75-77	-5	3	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15	MAVERICK ROAD 75-77	-6	2	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 75-77	-4	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 77-79	-8	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 75-77	-8	2	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 75-77	-18	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES EXPENDED	OE Scrap
OE-15	MAVERICK ROAD 29-31	-6	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 75-77	-12	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 83-85	-8	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 77-79	-30	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 77-79	-3	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 77-79	-18	2	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 75-77	-14	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 77-79	-8	8	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15	MAVERICK ROAD 69-71	-6	1	PROJECTILE, 105mm, SMOKE H.C., BE, M84 SERIES EXPENDED	OE Scrap
OE-15	MAVERICK ROAD 83-85	-12	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 69-71	-12	3	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43A1 LIVE	UXO
OE-15	MAVERICK ROAD 69-71	-12	4	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43A1 LIVE	UXO
OE-15	MAVERICK ROAD 69-71	-10	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 69-71	-12	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15	MAVERICK ROAD 75-77	-12	2	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 95-97	-1	2	PROJECTILE, 57mm, HE, M306 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 77-79	-12	1	PROJECTILE, 75mm, HE, M309A1 & M309 EXPENDED	OE Scrap
OE-15	MAVERICK ROAD 71-73	-12	1	FUZE, ROCKET, M404 LIVE	UXO
OE-15	MAVERICK ROAD 95-97	-12	15	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15	MAVERICK ROAD 81-83	-7	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15	MAVERICK ROAD 77-79	-6	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 81-83	-8	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 77-79	-12	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 79-81	-8	2	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15	MAVERICK ROAD 79-81	-8	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 81-83	-19	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 89-91	-8	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 71-73	-24	2	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 71-73	-18	2	PROJECTILE, 60mm, MORTAR, TARGET PRACTICE, M50A3 LIVE	UXO
OE-15	MAVERICK ROAD 61-69	-6	7	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 57-59	-12	3	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43A1 LIVE	UXO
OE-15	MAVERICK ROAD 71-73	-12	2	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43A1 LIVE	UXO
OE-15	MAVERICK ROAD 83-85	-1	1	PROJECTILE, 57mm, HE, M306 SERIES LIVE	UXO
OE-15	MAVERICK ROAD 71-73	-24	8	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43A1 LIVE	UXO
OE-15	MAVERICK ROAD 71-73	-12	10	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43A1 LIVE	UXO

Table 2. Ranges 43 through 48, UXO and OE Scrap Discovered During Investigations
Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
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Site Number	Grid Number	Depth (Inches)	QTY	Ordnance	Status
OE-15	MAVERICK ROAD 69-71	-6	3	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43A1 EXPENDED	OE Scrap
OE-15	MAVERICK ROAD 69-71	-6	3	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15	MAVERICK ROAD 69-71	-6	4	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43A1 EXPENDED	OE Scrap
OE-15	MAVERICK ROAD 61-63	-12	2	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43A1 LIVE	UXO
Fuel Break Clearance, MOCO 2					
OE-15 EDCBND	EDC 02 (MOCO 02)	-12	1	FUZE, PROJECTILE, COMBINATION, M1907 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 03 (MOCO 02)	-12	1	FUZE, PROJECTILE, POINT DETONATING, M51 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 03 (MOCO 02)	-24	1	FUZE, PROJECTILE, POINT DETONATING, M51 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 09 (MOCO 02)	-6	1	GRENADE, HAND, PRACTICE, DELAY, M30 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 09 (MOCO 02)	-4	1	PROJECTILE, 37mm, TP, M63, MOD 1 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 09 (MOCO 02)	-10	3	PROJECTILE, 60mm, MORTAR, ILLUMINATING, M721 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 09 (MOCO 02)	-8	1	SIGNALS, ILLUMINATION, GROUND, RED, M187; WHITE, M188; GREEN, M189; AMBER, M190 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 12 (MOCO 02)	-8	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 12 (MOCO 02)	-8	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 12 (MOCO 02)	-8	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 12 (MOCO 02)	-10	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 12 (MOCO 02)	-10	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 12 (MOCO 02)	-10	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 LIVE	UXO
OE-15 EDCBND	EDC 12 (MOCO 02)	-10	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 12 (MOCO 02)	-8	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 12 (MOCO 02)	-8	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 12 (MOCO 02)	-8	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 12 (MOCO 02)	-10	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 LIVE	UXO
OE-15 EDCBND	EDC 12 (MOCO 02)	-10	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 12 (MOCO 02)	-10	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 12 (MOCO 02)	-6	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 12 (MOCO 02)	-10	1	PROJECTILE, 60mm, MORTAR, ILLUMINATING, M721 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 12 (MOCO 02)	-8	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 12 (MOCO 02)	-8	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 LIVE	UXO
OE-15 EDCBND	EDC 12 (MOCO 02)	-10	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 12 (MOCO 02)	-8	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 LIVE	UXO
OE-15 EDCBND	EDC 12 (MOCO 02)	-8	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 12 (MOCO 02)	-10	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 LIVE	UXO
OE-15 EDCBND	EDC 12 (MOCO 02)	-10	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 12 (MOCO 02)	-12	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 12 (MOCO 02)	-8	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 LIVE	UXO
OE-15 EDCBND	EDC 12 (MOCO 02)	-8	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 12 (MOCO 02)	-10	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	EDC 14 (MOCO 02)	-6	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	EDC 14 (MOCO 02)	-3	1	SIGNALS, ILLUMINATION, GROUND, CLUSTERS, GREEN STAR, M125A1,RED STAR, M158,WHITE STAR, M159	UXO
OE-15 EDCBND	EDC 14 (MOCO 02)	-8	1	PROJECTILE, 40mm, HE, M381 LIVE	UXO
OE-15 EDCBND	EDC 14 (MOCO 02)	-6	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap

Table 2. Ranges 43 through 48, UXO and OE Scrap Discovered During Investigations
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Site Number	Grid Number	Depth (Inches)	QTY	Ordnance	Status
OE-15 EDCBND	EDC 14 (MOCO 02)	-6	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	FB 02 (MOCO 02)	-1	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 02 (MOCO 02)	-1	1	ROCKET, INCENDIARY, 66mm, TPA, M74 (FUZE & TAIL ONLY) LIVE	UXO
OE-15 EDCBND	FB 02 (MOCO 02)			2 LBS, PROJECTILE, 40mm, HE, M381 (FRAGMENTS) EXPENDED	OE Scrap
OE-15 EDCBND	FB 02 (MOCO 02)	-4	1	PROJECTILE, 155mm, SMOKE, BE, M116 SERIES, HC AND COLORED LIVE	UXO
OE-15 EDCBND	FB 02 (MOCO 02)	-6	2	PROJECTILE, 155mm, SMOKE, BE, M116 SERIES, HC AND COLORED (CANDLE ONLY) LIVE	UXO
OE-15 EDCBND	FB 02 (MOCO 02)	-30	1	PROJECTILE, 105mm, ILLUMINATING, M314 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 03 (MOCO 02)	0	2	ROCKET, 66mm, INCENDIARY, TPA, M74 LIVE	UXO
OE-15 EDCBND	FB 03 (MOCO 02)	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 03 (MOCO 02)	0	1	PROJECTILE, 40mm, HE, M386, (FRAGMENT BALL) LIVE	UXO
OE-15 EDCBND	FB 03 (MOCO 02)	0	1	ROCKET, 66mm, INCENDIARY, TPA, M74 LIVE	UXO
OE-15 EDCBND	FB 03 (MOCO 02)	-2	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 03 (MOCO 02)	0	1	ROCKET, 66mm, INCENDIARY, TPA, M74 LIVE	UXO
OE-15 EDCBND	FB 03 (MOCO 02)	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 04 (MOCO 02)	0	1	PROJECTILE, 84mm, HEAT, M136 (AT4) LIVE	UXO
OE-15 EDCBND	FB 04 (MOCO 02)	0	1	ROCKET, 66mm, INCENDIARY, TPA, M74 LIVE	UXO
OE-15 EDCBND	FB 04 (MOCO 02)	0	1	PROJECTILE, 84mm, HEAT, M136 (AT4) LIVE	UXO
OE-15 EDCBND	FB 04 (MOCO 02)	0	1	PROJECTILE, 84mm, HEAT, M136 (AT4) LIVE	UXO
OE-15 EDCBND	FB 04 (MOCO 02)	0	1	PROJECTILE, 84mm, HEAT, M136 (AT4) LIVE	UXO
OE-15 EDCBND	FB 04 (MOCO 02)	-36	1	PROJECTILE, 105mm, ILLUMINATING, M314 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 04 (MOCO 02)	0	1	PROJECTILE, 84mm, HEAT, M136 (AT4) LIVE	UXO
OE-15 EDCBND	FB 04 (MOCO 02)	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 04 (MOCO 02)	0	1	ROCKET, 66mm, HEAT, M72, M72A1, M72A2 & M72A3 LIVE	UXO
OE-15 EDCBND	FB 04 (MOCO 02)	0	2	ROCKET, 66mm, INCENDIARY, TPA, M74 LIVE	UXO
OE-15 EDCBND	FB 04 (MOCO 02)	-24	1	PROJECTILE, 105mm, SMOKE H.C., BE, M84 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 04 (MOCO 02)	-36	1	PROJECTILE, 105mm, SMOKE H.C., BE, M84 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 04 (MOCO 02)	-3	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 04 (MOCO 02)	-32	1	PROJECTILE, 105mm, SMOKE H.C., BE, M84 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 04 (MOCO 02)	-36	1	PROJECTILE, 155mm, SMOKE, BE, M116 SERIES, HC AND COLORED EXPENDED	OE Scrap
OE-15 EDCBND	FB 04 (MOCO 02)	-30	1	PROJECTILE, 105mm, SMOKE H.C., BE, M84 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 04 (MOCO 02)	-30	1	PROJECTILE, 75mm, SHRAPNEL, MK1 EXPENDED	OE Scrap
OE-15 EDCBND	FB 04 (MOCO 02)	-30	1	PROJECTILE, 155mm, SMOKE, BE, M116 SERIES, HC AND COLORED EXPENDED	OE Scrap
OE-15 EDCBND	FB 04 (MOCO 02)	-12	3	PROJECTILE, 155mm, SMOKE, BE, M116 SERIES, HC AND COLORED EXPENDED	OE Scrap
OE-15 EDCBND	FB 04 (MOCO 02)	-30	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 04 (MOCO 02)	-30	9	PROJECTILE, 105mm, SMOKE H.C., BE, M84 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 04 (MOCO 02)	-18	3	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 04 (MOCO 02)	-12	2	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 04 (MOCO 02)	-30	14	PROJECTILE, 155mm, SMOKE, BE, M116 SERIES, HC AND COLORED EXPENDED	OE Scrap
OE-15 EDCBND	FB 05 (MOCO 02)	-1	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 05 (MOCO 02)	-24	1	PROJECTILE, 105mm, SMOKE H.C., BE, M84 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 05 (MOCO 02)	-1	1	ROCKET, 66mm, HEAT, M72, M72A1, M72A2 & M72A3 LIVE	UXO
OE-15 EDCBND	FB 05 (MOCO 02)	-1	10	MISSILE, GUIDED, HEAT, M222 (DRAGON) (ROCKET MOTORS) LIVE	UXO
OE-15 EDCBND	FB 05 (MOCO 02)	-5	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 LIVE	UXO
OE-15 EDCBND	FB 05 (MOCO 02)	-1	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO

Table 2. Ranges 43 through 48, UXO and OE Scrap Discovered During Investigations
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Site Number	Grid Number	Depth (Inches)	QTY	Ordnance	Status
OE-15 EDCBND	FB 05 (MOCO 02)	-1	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 05 (MOCO 02)	-1	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 05 (MOCO 02)	-1	1	ROCKET, 66mm, INCENDIARY, TPA, M74 LIVE	UXO
OE-15 EDCBND	FB 05 (MOCO 02)	-1	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 05 (MOCO 02)	-1	1	ROCKET, INCENDIARY, 66mm, TPA, M74 LIVE	UXO
OE-15 EDCBND	FB 05 (MOCO 02)	-1	1	ROCKET, 66mm, INCENDIARY, TPA, M74 LIVE	UXO
OE-15 EDCBND	FB 05 (MOCO 02)	-1	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 05 (MOCO 02)	-3	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 LIVE	UXO
OE-15 EDCBND	FB 05 (MOCO 02)	-2	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-2	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-36	1	PROJECTILE, 105mm, SMOKE H.C., BE, M84 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 06 (MOCO 02)	-3	4	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-5	4	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-5	5	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-4	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-38	1	PROJECTILE, 105mm, SMOKE H.C., BE, M84 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 06 (MOCO 02)	-4	5	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	0	1	ROCKET, 66mm, INCENDIARY, TPA, M74 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-3	1	ROCKET, 66mm, HEAT, M72, M72A1, M72A2 & M72A3 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	0	16	ROCKET, 66mm, INCENDIARY, TPA, M74 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	0	1	ROCKET, 66mm, HEAT, M72, M72A1, M72A2 & M72A3 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	0	10	MISSILE, GUIDED, HEAT, M222 (DRAGON) (ROCKET MOTORS) LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	0	1	ROCKET, 66mm, INCENDIARY, TPA, M74 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-5	5	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-2	1	PROJECTILE, 40mm, PRACTICE, M781 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-7	13	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-6	7	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-6	5	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-5	7	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-2	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-6	5	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	0	7	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-4	4	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-2	1	PROJECTILE, 40mm, PRACTICE, M781 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-2	1	PROJECTILE, 40mm, PRACTICE, M781 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-4	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-4	5	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-4	5	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-4	7	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-5	7	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-3	8	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-4	9	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-8	5	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-5	6	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO

Table 2. Ranges 43 through 48, UXO and OE Scrap Discovered During Investigations
Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
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Site Number	Grid Number	Depth (Inches)	QTY	Ordnance	Status
OE-15 EDCBND	FB 06 (MOCO 02)	-6	7	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-5	3	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-3	5	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-6	7	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-4	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	0	1	ROCKET, 66mm, HEAT, M72, M72A1, M72A2 & M72A3 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	0	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-2	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-6	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-5	5	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-4	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	0	2	ROCKET, 66mm, INCENDIARY, TPA, M74 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-12	14	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	0	1	PROJECTILE, 40mm, HE, M386 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	0	7	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	0	11	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-4	2	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 06 (MOCO 02)	-6	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 LIVE	UXO
OE-15 EDCBND	FB 07 (MOCO 02)	-7	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-3	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 07 (MOCO 02)	-11	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-6	1	FUZE, PROJECTILE, BASE DETONATING, PRACTICE, M58 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-13	1	FUZE, PROJECTILE, BASE DETONATING, PRACTICE, M58 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-23	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-6	1	FUZE, PROJECTILE, BASE DETONATING, PRACTICE, M58 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-17	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-8	1	FUZE, PROJECTILE, BASE DETONATING, PRACTICE, M58 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-11	1	FUZE, PROJECTILE, BASE DETONATING, PRACTICE, M58 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-5	1	FUZE, PROJECTILE, BASE DETONATING, PRACTICE, M58 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-5	1	FUZE, PROJECTILE, BASE DETONATING, PRACTICE, M58 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-17	1	FUZE, PROJECTILE, BASE DETONATING, PRACTICE, M58 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-9	1	FUZE, PROJECTILE, BASE DETONATING, PRACTICE, M58 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-6	1	FUZE, PROJECTILE, BASE DETONATING, PRACTICE, M58 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-6	1	FUZE, PROJECTILE, BASE DETONATING, PRACTICE, M58 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-19	1	FUZE, PROJECTILE, BASE DETONATING, PRACTICE, M58 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-7	1	FUZE, PROJECTILE, BASE DETONATING, PRACTICE, M58 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-7	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-11	1	FUZE, PROJECTILE, BASE DETONATING, PRACTICE, M58 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-23	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)			10 LBS, FRAGMENTS, UNKNOWN EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-6	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-6	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-23	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 07 (MOCO 02)	-9	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap

Site Number	Grid Number	Depth (Inches)	QTY	Ordnance	Status
OE-15 EDCBND	FB 07 (MOCO 02)	-18	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-26	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-6	1	FUZE, PROJECTILE, BASE DETONATING, PRACTICE, M58 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-7	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-18	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-6	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-5	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-30	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-6	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-5	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-11	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-11	1	FUZE, PROJECTILE, BASE DETONATING, PRACTICE, M58 EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-3	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 07 (MOCO 02)	-16	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap
OE-15 EDCBND	FB 08 (MOCO 02)	-7	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 08 (MOCO 02)	-3	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 08 (MOCO 02)	-12	1	PROJECTILE, 81mm, MORTAR, ILLUMINATING, M301 SERIES LIVE	UXO
OE-15 EDCBND	FB 08 (MOCO 02)	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 08 (MOCO 02)	-18	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 08 (MOCO 02)	-7	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 08 (MOCO 02)	-9	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 08 (MOCO 02)	0	1	PROJECTILE, 84mm, HEAT, M136 (AT4) LIVE	UXO
OE-15 EDCBND	FB 08 (MOCO 02)	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap
OE-15 EDCBND	FB 08 (MOCO 02)	-6	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap
OE-15 EDCBND	FB 08 (MOCO 02)	-6	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 08 (MOCO 02)	-30	1	PROJECTILE, 105mm, ILLUMINATING, M314 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 08 (MOCO 02)	-17	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap
OE-15 EDCBND	FB 08 (MOCO 02)	-7	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap
OE-15 EDCBND	FB 08 (MOCO 02)	-11	1	FUZE, PROJECTILE, BASE DETONATING, PRACTICE, M58 EXPENDED	OE Scrap
OE-15 EDCBND	FB 08 (MOCO 02)	-23	1	FUZE, PROJECTILE, BASE DETONATING, PRACTICE, M58 EXPENDED	OE Scrap
OE-15 EDCBND	FB 08 (MOCO 02)	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap
OE-15 EDCBND	FB 08 (MOCO 02)	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap
OE-15 EDCBND	FB 08 (MOCO 02)	-11	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 09 (MOCO 02)	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 09 (MOCO 02)	-15	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 09 (MOCO 02)	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 09 (MOCO 02)	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 09 (MOCO 02)	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 09 (MOCO 02)	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 09 (MOCO 02)	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 09 (MOCO 02)	-12	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 09 (MOCO 02)	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 09 (MOCO 02)	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 09 (MOCO 02)	0	1	PROJECTILE, 40mm, HEDP, M430 LIVE	UXO

Table 2. Ranges 43 through 48, UXO and OE Scrap Discovered During Investigations
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Site Number	Grid Number	Depth (Inches)	QTY	Ordnance	Status
OE-15 EDCBND	FB 09 (MOCO 02)	-30	1	PROJECTILE, 105mm, ILLUMINATING, M314 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB 09 (MOCO 02)	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15 EDCBND	FB 09 (MOCO 02)	0	1	ROCKET, 66mm, HEAT, M72, M72A1, M72A2 & M72A3 LIVE	UXO
OE-15 EDCBND	FB 10 (MOCO 02)	-12	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	FB 10 (MOCO 02)	-8	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	FB 10 (MOCO 02)	-7	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap
OE-15 EDCBND	FB 10 (MOCO 02)		1	PROJECTILE, 60mm, MORTAR, ILLUMINATING, M721 EXPENDED	OE Scrap
OE-15 EDCBND	FB 10 (MOCO 02)	-7	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap
OE-15 EDCBND	FB 10 (MOCO 02)	-11	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap
OE-15 EDCBND	FB 10 (MOCO 02)	-11	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	FB 10 (MOCO 02)	-8	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	FB 11 (MOCO 02)		1	PROJECTILE, 40mm, PRACTICE, M382 EXPENDED	OE Scrap
OE-15 EDCBND	FB 11 (MOCO 02)	-5	1	PROJECTILE, 60mm, MORTAR, ILLUMINATING, M721 EXPENDED	OE Scrap
OE-15 EDCBND	FB 11 (MOCO 02)	-10	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	FB 11 (MOCO 02)		1	PROJECTILE, 40mm, PRACTICE, 918 EXPENDED	OE Scrap
OE-15 EDCBND	FB 11 (MOCO 02)	-9	1	PROJECTILE, 60mm, MORTAR, ILLUMINATING, M721 EXPENDED	OE Scrap
OE-15 EDCBND	FB 11 (MOCO 02)	-12	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	FB 11 (MOCO 02)		1	PROJECTILE, 60mm, MORTAR, ILLUMINATING, M721 EXPENDED	OE Scrap
OE-15 EDCBND	FB 12 (MOCO 02)	0	1	PROJECTILE, 60mm, MORTAR, TARGET PRACTICE, M50A3 EXPENDED	OE Scrap
OE-15 EDCBND	FB 12 (MOCO 02)	-19	1	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES (FRAGMENTS) EXPENDED	OE Scrap
OE-15 EDCBND	FB 12 (MOCO 02)	-7	1	SIGNALS, ILLUMINATION, GROUND, CLUSTERS, GREEN STAR, M125A1, RED STAR, M158, WHITE STAR, M159 EXPENDED	OE Scrap
OE-15 EDCBND	FB E11 (MOCO 02)	-7	1	PROJECTILE, 60mm, MORTAR, TRAINING, M69 EXPENDED	OE Scrap
Fuel Break Clearance, Seaside 4					
OE-15 EDCBND	SS04 22	-4	1	MINE, ANTITANK, PRACTICE, M12 SERIES LIVE	UXO
OE-15 EDCBND	SS04 23	-6	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15 EDCBND	SS04 23	-2	1	RAW PYROTECHNIC MIXTURE LIVE	UXO
OE-15 EDCBND	SS04 24	-8	1	MINE, ANTIPERSONNEL, M2A4 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	SS04 24	-6	1	CARTRIDGE, IGNITION, M2 SERIES LIVE	UXO
OE-15 EDCBND	SS04 24	-12	1	ROCKET, 3.5 INCH, PRACTICE, M29A2 (ROCKET MOTOR) EXPENDED	OE Scrap
OE-15 EDCBND	SS04 25	-40	1	CARTRIDGE CASE, 57mm, M301A1 EXPENDED	UXO
OE-15 EDCBND	SS04 26	-6	1	PROJECTILE, 57mm, HE, M306 SERIES LIVE	UXO
OE-15 EDCBND	SS04 26	-24	1	GRENADE, RIFLE, AT, PRACTICE, M9 EXPENDED	OE Scrap
2001 Fuel Break Data					
Maverick Rd.	MR016	0	6	ROCKET MOTOR, 3.5 INCH	OE Scrap
Maverick Rd.	MR016	0	1	ROCKET MOTOR, 3.5 INCH	OE Scrap
Maverick Rd.	MR037	0		PROJECTILE, 75mm, HE, M48 SERIES (FRAGMENTS)	OE Scrap
Maverick Rd.	MR037	0		PROJECTILE, 81mm, MORTAR, SMOKE, WP, M57 SERIES (FRAGMENTS)	OE Scrap
Maverick Rd.	MR036	0	2	MISSILE, GUIDED, HEAT, M222 SERIES (DRAGON) (ROCKET MOTOR)	OE Scrap
Maverick Rd.	MR036	0	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap

Table 2. Ranges 43 through 48, UXO and OE Scrap Discovered During Investigations
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Site Number	Grid Number	Depth (Inches)	QTY	Ordnance	Status
Maverick Rd.	MR036	0	1	PROJECTILE, 60mm, MORTAR, TARGET PRACTICE, M50 SERIES	UXO
Maverick Rd.	MR035	0	1	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43 SERIES	OE Scrap
Maverick Rd.	MR033	0	1	PROJECTILE, 84mm, PRACTICE, FY 552	OE Scrap
Maverick Rd.	MR029	0	1	PROJECTILE, 105mm, SMOKE, HC, BE, M84 SERIES	OE Scrap
Maverick Rd.	MR027	0	1	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43 SERIES	UXO
Maverick Rd.	MR026	0	1	PROJECTILE, 84mm, HEAT, M136 (AT4)	UXO
Maverick Rd.	MR020	0	1	SIGNAL, ILLUMINATION, HAND, FIRED, COMET, 1260	OE Scrap
Maverick Rd.	MR019	0	1	ROCKET, 3.5 INCH, PRACTICE, M29A2	OE Scrap
Maverick Rd.	MR019	0	1	SIGNAL, ILLUMINATION, HAND, FIRED, COMET, 1260	OE Scrap
Maverick Rd.	MR018	0	2	ROCKET MOTOR, 3.5 INCH	OE Scrap
Maverick Rd.	MR018	0	1	ROCKET, 66mm, HEAT, M72 SERIES (MOTOR ONLY)	OE Scrap
Maverick Rd.	MR045	0	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Maverick Rd.	MR045	0		PROJECTILE, 75mm, HE, M48 SERIES (FRAGMENTS)	OE Scrap
Maverick Rd.	MR045	0	2	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Maverick Rd.	MR042	0	1	FUZE, PROJECTILE, POINT DETONATING, M524 SERIES	OE Scrap
Maverick Rd.	MR042	0	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Maverick Rd.	MR041	0	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Maverick Rd.	MR040	0	3	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Maverick Rd.	MR040	0	2	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Maverick Rd.	MR039	0	6	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Maverick Rd.	MR039	0	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Maverick Rd.	MR038	0	4	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Maverick Rd.	MR038	0	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Maverick Rd.	MR038	0	2	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Maverick Rd.	MR037	0	52	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43 SERIES	OE Scrap
Maverick Rd.	MR037	0	10	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Maverick Rd.	MR037	0	1	ROCKET MOTOR, 3.5 INCH	OE Scrap
Maverick Rd.	MR017	0	3	ROCKET MOTOR, 3.5 INCH	OE Scrap
Maverick Rd.	MR017	-2	12	ROCKET, 66mm, HEAT, M72 SERIES (MOTOR ONLY)	OE Scrap
Maverick Rd.	MR037	0	58	PROJECTILE, 60mm, MORTAR, TARGET PRACTICE, M50 SERIES	OE Scrap
Maverick Rd.	MR036	0	1	PROJECTILE, 57mm, HE, M306 SERIES (NO FUZE)	UXO
Maverick Rd.	MR017	0	2	ROCKET, 66mm, HEAT, M72 SERIES (MOTOR ONLY)	OE Scrap
Maverick Rd.	MR017	0	1	ROCKET, 66mm, HEAT, M72 SERIES (MOTOR ONLY)	OE Scrap
Maverick Rd.	MR017	0	1	ROCKET, 3.5 INCH, PRACTICE, M29A2 (WARHEAD ONLY)	OE Scrap
Maverick Rd.	MR017	0	1	ROCKET MOTOR, 3.5 INCH	OE Scrap
Maverick Rd.	MR017	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 SERIES	OE Scrap
Maverick Rd.	MR017	0	6	ROCKET, 66mm, HEAT, M72 SERIES (MOTOR ONLY)	OE Scrap
Maverick Rd.	MR017	0	1	SIGNAL, ILLUMINATION, GROUND, PARACHUTE, WHITE STAR, M127A1	OE Scrap
Maverick Rd.	MR017	0	1	SIGNAL, ILLUMINATION, HAND, FIRED, COMET, 1260	OE Scrap
Maverick Rd.	MR015	0	2	ROCKET MOTOR, 3.5 INCH	OE Scrap
Maverick Rd.	MR015	0	1	ROCKET, 66mm, HEAT, M72 SERIES (MOTOR ONLY)	OE Scrap
Maverick Rd.	MR015	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 SERIES	OE Scrap
Maverick Rd.	MR015	0	3	ROCKET MOTOR, 3.5 INCH	OE Scrap
Maverick Rd.	MR015	0	2	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 SERIES	OE Scrap

Table 2. Ranges 43 through 48, UXO and OE Scrap Discovered During Investigations
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Site Number	Grid Number	Depth (Inches)	QTY	Ordnance	Status
Maverick Rd.	MR014	0	3	ROCKET MOTOR, 3.5 INCH	OE Scrap
Maverick Rd.	MR014	0	4	ROCKET MOTOR, 3.5 INCH	OE Scrap
Maverick Rd.	MR014	0	2	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 SERIES	UXO
Maverick Rd.	MR047	0	1	PROJECTILE, 81mm, MORTAR, HE, M43A1	OE Scrap
Maverick Rd.	MR013	0	10	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 SERIES	OE Scrap
Maverick Rd.	MR013	0	3	ROCKET, 2.36 INCH, PRACTICE, M7 SERIES (MOTOR ONLY)	OE Scrap
Maverick Rd.	MR013	0	2	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 SERIES	OE Scrap
Maverick Rd.	MR013	0	2	ROCKET, 66mm, HEAT, M72 SERIES (MOTOR ONLY)	OE Scrap
Maverick Rd.	MR013	0	1	ROCKET MOTOR, 3.5 INCH	OE Scrap
Maverick Rd.	MR013	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 SERIES	OE Scrap
Maverick Rd.	MR013	0	1	ROCKET, 2.36 INCH, PRACTICE, M7 SERIES (MOTOR ONLY)	OE Scrap
Pipeline Rd.	PR024L	-12	1	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43 SERIES	UXO
Pipeline Rd.	PR024L	-8	1	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR022L	-6	1	PROJECTILE, 81mm, MORTAR, HE, M43A1	UXO
Pipeline Rd.	PR022L	-18	1	PROJECTILE, 81mm, MORTAR, HE, M43A1 (W/O FUZE)	UXO
Pipeline Rd.	PR022L	-24	1	PROJECTILE, 81mm, MORTAR, HE, M43A1 (W/O FUZE)	UXO
Pipeline Rd.	PR022L	-12	1	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43 SERIES	UXO
Pipeline Rd.	PR022L	-18	1	PROJECTILE, 81mm, MORTAR, HE, M43A1 (W/O FUZE)	UXO
Pipeline Rd.	PR022L	-18	1	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43 SERIES	UXO
Pipeline Rd.	PR024L	-18	1	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43 SERIES	UXO
Pipeline Rd.	PR023L	-14	1	PROJECTILE, 81mm, MORTAR, HE, M43A1	UXO
Pipeline Rd.	PR023L	-14	1	PROJECTILE, 81mm, MORTAR, HE, M43A1	UXO
Pipeline Rd.	PR023L	-8	1	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR023L	-10	1	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR023L	-8	2	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR023L	-6	2	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR023L	-6	1	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR023L	-6	2	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR023L	-8	1	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR023L	-10	1	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR021	-14	1	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43 SERIES	UXO
Pipeline Rd.	PR021	-8	1	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR021	-8	1	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR021	-10	1	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR021	-8	1	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR024L	-8	1	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR018	-4	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Pipeline Rd.	PR014	-7	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Pipeline Rd.	PR013	-5	1	PROJECTILE, 57mm, HE, M306 SERIES	UXO
Pipeline Rd.	PR013	-6	1	PROJECTILE, 57mm, HE, M306 SERIES	UXO
Pipeline Rd.	PR019	-6	1	PROJECTILE, 57mm, HE, M306 SERIES	UXO
Pipeline Rd.	PR019	-2	1	FUZE, PROJECTILE, POWDER, TRAIN, TIME, M84A1	OE Scrap
Pipeline Rd.	PR012	-18	1	PROJECTILE, 155mm, SMOKE, HC, M116A1	OE Scrap
Pipeline Rd.	PR009	-8	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap

Table 2. Ranges 43 through 48, UXO and OE Scrap Discovered During Investigations
Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
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Site Number	Grid Number	Depth (Inches)	QTY	Ordnance	Status
Pipeline Rd.	PR007	-2	1	FUZE, PROJECTILE, POINT DETONATING, M524 SERIES	OE Scrap
Pipeline Rd.	PR008	-6	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Pipeline Rd.	PR008	-2	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Pipeline Rd.	PR006	-4	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Pipeline Rd.	PR006	-6	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Pipeline Rd.	PR005	-2	1	FUZE, PROJECTILE, POINT DETONATING, M524 SERIES	OE Scrap
Pipeline Rd.	PR003	-4	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Pipeline Rd.	PR003	-4	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Pipeline Rd.	PR041L	-8	1	FUZE, PROJECTILE, POWDER, TRAIN, TIME, M84A1	OE Scrap
Pipeline Rd.	PR002	-12	1	PROJECTILE, 57mm, HE, M306 SERIES	UXO
Pipeline Rd.	PR001	-9	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Pipeline Rd.	PR001	0	1	FUZE, PROJECTILE, POINT DETONATING, M524 SERIES	OE Scrap
Pipeline Rd.	PR001	-14	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Pipeline Rd.	PR003	-2	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Pipeline Rd.	PR025L	-6	1	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR025L	-8	1	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR026L	-8	1	PROJECTILE, 81mm, MORTAR, ILLUMINATION, M301 SERIES (FINS ONLY)	OE Scrap
Pipeline Rd.	PR026L	-8	1	PROJECTILE, 81mm, MORTAR, ILLUMINATION, M301 SERIES	OE Scrap
Pipeline Rd.	PR026L	-6	1	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR028L	-10	1	PROJECTILE, 37mm, LE, MK I	UXO
Pipeline Rd.	PR027L	-12	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Pipeline Rd.	PR027L	-8	1	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR022L	-18	1	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43 SERIES	UXO
Pipeline Rd.	PR021	-20	1	PROJECTILE, 81mm, MORTAR, HE, M374 SERIES	UXO
Pipeline Rd.	PR021	-24	1	PROJECTILE, 81mm, MORTAR, HE, M374 SERIES	UXO
Pipeline Rd.	PR024L	-10	1	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR024L	-12	1	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR024L	-10	2	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR024L	-8	1	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR024L	-6	2	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PR024L	-8	1	PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Pipeline Rd.	PE002	0	3	PROJECTILE, 84mm, PRACTICE, FY 552	OE Scrap
Pipeline Rd.	PE002	0		PROJECTILE, 75mm, HE, M48 SERIES (FRAGMENTS)	OE Scrap
Pipeline Rd.	PE002	0		PROJECTILE, 81mm, MORTAR, SMOKE, WP, M57 SERIES (FRAGMENTS)	OE Scrap
Pipeline Rd.	PE002	0	1	ROCKET, 3.5 INCH, PRACTICE, M29A2	OE Scrap
Pipeline Rd.	PE002	0	1	PROJECTILE, 81mm, MORTAR, ILLUMINATION, M301 SERIES	OE Scrap
Pipeline Rd.	PE003	0	2	FUZE, PROJECTILE, POINT DETONATING, M524 SERIES	OE Scrap
Pipeline Rd.	PE005	0	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Pipeline Rd.	PE008	0	1	PROJECTILE, 60mm, MORTAR, ILLUMINATION, M83 SERIES	OE Scrap
Pipeline Rd.	PE008	0	1	PROJECTILE, 155mm, SMOKE, HC, M116A1	OE Scrap
Pipeline Rd.	PE008	0	1	PROJECTILE, 57mm, HE, M306 SERIES	UXO
Pipeline Rd.	PE015	0	1	PROJECTILE, 60mm, MORTAR, TARGET PRACTICE, M50 SERIES	UXO
Pipeline Rd.	PE015	0	1	PROJECTILE, 60mm, MORTAR, ILLUMINATION, M83 SERIES	OE Scrap
Pipeline Rd.	PE016	0	1	PROJECTILE, 60mm, MORTAR, ILLUMINATION, M83 SERIES	OE Scrap

Table 2. Ranges 43 through 48, UXO and OE Scrap Discovered During Investigations
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Site Number	Grid Number	Depth (Inches)	QTY	Ordnance	Status
Pipeline Rd.	PE016	0		PROJECTILE, 75mm, HE, M48 SERIES (FRAGMENTS)	OE Scrap
Pipeline Rd.	PE017	0	1	PROJECTILE, 57mm, TPT, M70 SERIES	OE Scrap
Pipeline Rd.	PE017	0	1	PROJECTILE, 60mm, MORTAR, ILLUMINATION, M83 SERIES	OE Scrap
Pipeline Rd.	PE018	0	1	PROJECTILE, 57mm, HE, M306 SERIES	UXO
Pipeline Rd.	PE019	0	3	PROJECTILE, 81mm, MORTAR, ILLUMINATION, M301 SERIES	OE Scrap
Pipeline Rd.	PE019	0	1	PROJECTILE, 81mm, MORTAR, ILLUMINATION, M301 SERIES	OE Scrap
Pipeline Rd.	PE019	0	1	PROJECTILE, 60mm, MORTAR, ILLUMINATION, M83 SERIES	OE Scrap
Pipeline Rd.	PE020	0	1	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43 SERIES	OE Scrap
Pipeline Rd.	PE021	-1	1	PROJECTILE, 81mm, MORTAR, HE, M362 SERIES	UXO
Pipeline Rd.	PE022	-1	1	PROJECTILE, 81mm, MORTAR, HE, M374 SERIES	UXO
Pipeline Rd.	PE022	0	2	PROJECTILE, 81mm, MORTAR, ILLUMINATION, M301 SERIES	OE Scrap
Pipeline Rd.	PE022	0	3	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43 SERIES	UXO
Pipeline Rd.	PE022	0	1	PROJECTILE, 81mm, MORTAR, ILLUMINATION, M301 SERIES	OE Scrap
Pipeline Rd.	PE024	0	2	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43 SERIES	OE Scrap
Pipeline Rd.	PE025	0	1	PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43 SERIES	OE Scrap
Pipeline Rd.	PE025	0	1	PROJECTILE, 60mm, MORTAR, ILLUMINATION, M83 SERIES	OE Scrap
Pipeline Rd.	PE027	0	1	PROJECTILE, 155mm, SMOKE, HC, M116A1	OE Scrap
Pipeline Rd.	PE027	0	1	PROJECTILE, 105mm, SMOKE, HC, BE, M84 SERIES	OE Scrap
Pipeline Rd.	PE027	0		PROJECTILE, 105mm, HE, M1 SERIES (FRAGMENTS)	UXO
Pipeline Rd.	PE027	0	3	PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Pipeline Rd.	PE027	0	1	PROJECTILE, 60mm, MORTAR, ILLUMINATION, M83 SERIES	OE Scrap
Pipeline Rd.	PE028	0	1	PROJECTILE, 40mm, GROUND MARKER, GREEN SMOKE, M715 SERIES	OE Scrap
Pipeline Rd.	PE030	0	1	PROJECTILE, 81mm, MORTAR, ILLUMINATION, M301 SERIES	OE Scrap
Pipeline Rd.	PE031	0	1	PROJECTILE, 40mm, PRACTICE, M781 SERIES	UXO
Pipeline Rd.	PE033	0	1	PROJECTILE, 81mm, MORTAR, ILLUMINATION, M301 SERIES	OE Scrap
Pipeline Rd.	PE040	0	1	PROJECTILE, 75mm, HE, M48 SERIES	UXO
Pipeline Rd.	PE041	0	1	PROJECTILE, 81mm, MORTAR, ILLUMINATION, M301 SERIES	OE Scrap
Pipeline Rd.	PE041	0	1	PROJECTILE, 60mm, MORTAR, ILLUMINATION, M83 SERIES	OE Scrap
Pipeline Rd.	PE043	0	2	PROJECTILE, 60mm, MORTAR, ILLUMINATION, M83 SERIES	OE Scrap
Pipeline Rd.	PE045	-1	1	PROJECTILE, 155mm, SMOKE, HC, M116A1	OE Scrap
Pipeline Rd.	PE046	0	1	PROJECTILE, 60mm, MORTAR, ILLUMINATION, M83 SERIES	OE Scrap
Site Specific Grid Samping, MOCO 2					
OE-15 MOCO 02	G 02	-1	1	SIGNALS, ILLUMINATION, GROUND, PARACHUTE, GREEN STAR, M19A2 EXPENDED	OE Scrap
OE-15 MOCO 02	G 03	-6	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 MOCO 02	G 03	-12	1	FUZE, PROJECTILE, COMBINATION, M1907 LIVE	UXO
OE-15 MOCO 02	G 04	-3	1	FUZE, PROJECTILE, COMBINATION, M1907 EXPENDED	OE Scrap
OE-15 MOCO 02	G 04	-6	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 MOCO 02	G 04	-10	1	FUZE, PROJECTILE, COMBINATION, M1907 LIVE	UXO
OE-15 MOCO 02	G 05	-8	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 MOCO 02	G 07	-3	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 MOCO 02	G 07	-12	1	FLARE, PARACHUTE, TRIP, M48 EXPENDED	OE Scrap

Table 2. Ranges 43 through 48, UXO and OE Scrap Discovered During Investigations
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OE-15 MOCO 02	G 07	-3	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 LIVE	UXO
OE-15 MOCO 02	G 07	-3	1	FUZE, GRENADE, HAND, PRACTICE, M228 EXPENDED	OE Scrap
OE-15 MOCO 02	G 07	-6	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 MOCO 02	G 07	-6	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 MOCO 02	G 07	-6	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 MOCO 02	G 07	-3	1	FUZE, GRENADE, HAND, PRACTICE, M228 EXPENDED	OE Scrap
OE-15 MOCO 02	G 07	-6	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 LIVE	UXO
OE-15 MOCO 02	G 07	-6	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 LIVE	UXO
OE-15 MOCO 02	G 07	-3	1	FUZE, GRENADE, HAND, PRACTICE, M228 EXPENDED	OE Scrap
OE-15 MOCO 02	G 07	-6	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 MOCO 02	G 07	-6	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 MOCO 02	G 07	-3	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 MOCO 02	G 07	-3	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 MOCO 02	G 07	-3	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 MOCO 02	G 07	-6	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 MOCO 02	G 07	-3	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 LIVE	UXO
OE-15 MOCO 02	G 07	-6	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 MOCO 02	G 07	-3	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 MOCO 02	G 07	-6	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 MOCO 02	G 07	-6	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 MOCO 02	G 07	0	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 LIVE	UXO
OE-15 MOCO 02	G 07	-3	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 MOCO 02	G 07	-12	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 MOCO 02	G 07	-6	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 LIVE	UXO
OE-15 MOCO 02	G 07	-6	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 MOCO 02	G 07	-6	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 MOCO 02	G 07	-4	1	PROJECTILE, 14.5mm, SUBCALIBER, PRACTICE, M183A1 LIVE	UXO
OE-15 MOCO 02	G 07	-3	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 MOCO 02	G 08	0		FRAGMENTS, UNKNOWN EXPENDED	OE Scrap
OE-15 MOCO 02	G 08	-4	1	GRENADE, HAND, PRACTICE, MK 2 EXPENDED	OE Scrap
OE-15 MOCO 02	G 08	-8	1	PROJECTILE, 75mm, SHRAPNEL, MK I EXPENDED	OE Scrap
OE-15 MOCO 02	G 09	-10	1	SIGNALS, ILLUMINATION, GROUND, PARACHUTE, GREEN STAR, M19A2 EXPENDED	OE Scrap
OE-15 MOCO 02	G 09	0		PROJECTILE, 105mm, HE, M444 (FRAGMENTS) EXPENDED	OE Scrap
OE-15 MOCO 02	G 09	-12	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 MOCO 02	G 09	0	1	DETONATING CORD LIVE	UXO
OE-15 MOCO 02	G 09	-3	1	MINE, ANTIPERSONNEL, M16 SERIES, INERT EXPENDED	OE Scrap
OE-15 MOCO 02	G 10	0		FRAGMENTS, UNKNOWN EXPENDED	OE Scrap
OE-15 MOCO 02	G 11	-4	1	FUZE, GRENADE, HAND, M205 SERIES EXPENDED	OE Scrap
OE-15 MOCO 02	G 11	-3	1	FUZE, GRENADE, HAND, M205 SERIES LIVE	UXO
OE-15 MOCO 02	G 11	0		FRAGMENTS, UNKNOWN EXPENDED	OE Scrap
OE-15 MOCO 02	G 11	-4	2	FUZE, GRENADE, HAND, M205 SERIES EXPENDED	OE Scrap
OE-15 MOCO 02	G 11	0		PROJECTILE, 75mm, HE, M48 (FRAGMENTS) EXPENDED	OE Scrap
OE-15 MOCO 02	G 11	-8	1	GRENADE, HAND, PRACTICE, MK 2 EXPENDED	OE Scrap

Table 2. Ranges 43 through 48, UXO and OE Scrap Discovered During Investigations
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OE-15 MOCO 02	G 11	-2	1	FUZE, GRENADE, HAND, M205 SERIES EXPENDED	OE Scrap
OE-15 MOCO 02	G 12	0		FRAGMENTS, UNKNOWN EXPENDED	OE Scrap
OE-15 MOCO 02	G 12	-24	1	CAP, BLASTING, ELECTRIC, M6 LIVE	UXO
OE-15 MOCO 02	G 12	-6	1	FUZE, GRENADE, HAND, M205 SERIES EXPENDED	OE Scrap
OE-15 MOCO 02	G 12	-6	1	FUZE, GRENADE, HAND, PRACTICE, M228 EXPENDED	OE Scrap
OE-15 MOCO 02	G 12	-3	1	FUZE, GRENADE, HAND, PRACTICE, M228 EXPENDED	OE Scrap
OE-15 MOCO 02	G 12	-3	1	FUZE, GRENADE, HAND, PRACTICE, M228 EXPENDED	OE Scrap
OE-15 MOCO 02	G 12	-24	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES LIVE	UXO
OE-15 MOCO 02	G 12	-6	1	GRENADE, HAND, PRACTICE, MK 2 EXPENDED	OE Scrap
OE-15 MOCO 02	G 12	-24	1	PROJECTILE, 75mm, SHRAPNEL, MK I LIVE	UXO
OE-15 MOCO 02	G 13	-3	1	GRENADE, HAND, ILLUMINATING, MK I EXPENDED	OE Scrap
OE-15 MOCO 02	G 13	-6	1	SIGNALS, ILLUMINATION, GROUND, CLUSTERS, GREEN STAR, M125A1,RED STAR, M158,WHITE STAR, M159	OE Scrap
OE-15 MOCO 02	G 13	-6	1	GRENADE, HAND, ILLUMINATING, MK I LIVE	UXO
OE-15 MOCO 02	G 13	-6	1	GRENADE, HAND, ILLUMINATING, MK I EXPENDED	OE Scrap
OE-15 MOCO 02	G 13	-12	1	GRENADE, HAND, SMOKE, COMMERCIAL LIVE	UXO
OE-15 MOCO 02	G 13	-3	1	FUZE, GRENADE, HAND, PRACTICE, M228 EXPENDED	OE Scrap
OE-15 MOCO 02	G 13	-12	1	GRENADE, HAND, ILLUMINATION, MK I EXPENDED	OE Scrap
OE-15 MOCO 02	G 14	-3	1	FUZE, GRENADE, HAND, PRACTICE, M228 EXPENDED	OE Scrap
OE-15 MOCO 02	G 14	-8	1	GRENADE, HAND, PRACTICE, MK 2 EXPENDED	OE Scrap
OE-15 MOCO 02	G 14	-2	1	GRENADE, HAND, PRACTICE, MK 2 EXPENDED	OE Scrap
OE-15 MOCO 02	G 14	-6	1	GRENADE, HAND, PRACTICE, MK 2 EXPENDED	OE Scrap
OE-15 MOCO 02	G 14	-8	1	FUZE, GRENADE, HAND, M205 SERIES EXPENDED	OE Scrap
OE-15 MOCO 02	G 14	0		FRAGMENTS, UNKNOWN EXPENDED	OE Scrap
OE-15 MOCO 02	G 14	-4	2	FUZE, GRENADE, HAND, M205 SERIES EXPENDED	OE Scrap
OE-15 MOCO 02	G 14	-3	1	FUZE, GRENADE, HAND, M205 SERIES LIVE	UXO
OE-15 MOCO 02	G 14	-6	4	FUZE, GRENADE, HAND, PRACTICE, M228 EXPENDED	OE Scrap
OE-15 MOCO 02	G 14	-12	2	GRENADE, HAND, PRACTICE, MK 2 EXPENDED	OE Scrap
OE-15 MOCO 02	G 14	-1	1	FUZE, GRENADE, HAND, PRACTICE, M228 EXPENDED	OE Scrap
OE-15 MOCO 02	G 14	-1	1	FUZE, GRENADE, HAND, PRACTICE, M228 EXPENDED	OE Scrap
OE-15 MOCO 02	G 14	-10	1	GRENADE, HAND, PRACTICE, MK 2 EXPENDED	OE Scrap
OE-15 MOCO 02	G 14	-6	1	GRENADE, HAND, PRACTICE, MK 2 EXPENDED	OE Scrap
OE-15 MOCO 02	G 14	-1	1	FUZE, GRENADE, HAND, PRACTICE, M228 EXPENDED	OE Scrap
OE-15 MOCO 02	G 14	-1	1	FUZE, GRENADE, HAND, M205 SERIES EXPENDED	OE Scrap
OE-15 MOCO 02	G 15	-2	1	FUZE, GRENADE, HAND, M205 SERIES EXPENDED	OE Scrap
OE-15 MOCO 02	G 15	0		PROJECTILE, 81mm, MORTAR, HE, M43 SERIES (FRAGMENTS) EXPENDED	OE Scrap
OE-15 MOCO 02	G 15	-10	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 MOCO 02	G 15	-3	1	FUZE, GRENADE, HAND, M205 SERIES EXPENDED	OE Scrap
OE-15 MOCO 02	G 15	-6	1	GRENADE, HAND, PRACTICE, MK 2 EXPENDED	OE Scrap
OE-15 MOCO 02	G 15	-8	1	FUZE, GRENADE, HAND, M204 EXPENDED	OE Scrap
OE-15 MOCO 02	G 16	0		FRAGMENTS, UNKNOWN EXPENDED	OE Scrap
OE-15 MOCO 02	G 16	-6	1	FLARE, SURFACE, TRIP, M49 LIVE	UXO
OE-15 MOCO 02	G 17	0		FRAGMENTS, UNKNOWN EXPENDED	OE Scrap
OE-15 MOCO 02	G 17	0		FRAGMENTS, UNKNOWN EXPENDED	OE Scrap
OE-15 MOCO 02	G 18	-24	1	ROCKET, 2.36 INCH, PRACTICE, M7 SERIES EXPENDED	OE Scrap

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OE-15 MOCO 02	G 18	-24	4	ROCKET, 2.36 INCH, PRACTICE, M7 SERIES EXPENDED	OE Scrap
OE-15 MOCO 02	G 18	-1	1	GRENADE, HAND, PRACTICE, MK 2 EXPENDED	OE Scrap
OE-15 MOCO 02	G 19	-6	1	FUZE, GRENADE, HAND, PRACTICE, M228 EXPENDED	OE Scrap
OE-15 MOCO 02	G 19	0		FRAGMENTS, UNKNOWN EXPENDED	OE Scrap
OE-15 MOCO 02	G 20	-16	1	GRENADE, HAND, PRACTICE, MK 2 EXPENDED	OE Scrap
OE-15 MOCO 02	G 20	0		FRAGMENTS, UNKNOWN EXPENDED	OE Scrap
OE-15 MOCO 02	G 20	-2	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap
OE-15 MOCO 02	G 20	-4	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 MOCO 02	G 21	0		FRAGMENTS, UNKNOWN EXPENDED	OE Scrap
OE-15 MOCO 02	G 22	-12	1	GRENADE, HAND, PRACTICE, MK 2 EXPENDED	OE Scrap
OE-15 MOCO 02	G 22	-12	1	PRIMER, IGNITER TUBE, M5 LIVE	UXO
OE-15 MOCO 02	G 22	-12	2	PRIMER, IGNITER TUBE, M57 LIVE	UXO
OE-15 MOCO 02	G 22	-4	1	GRENADE, HAND, PRACTICE, MK 2 LIVE	UXO
OE-15 MOCO 02	G 23	0		PROJECTILE, 81mm, MORTAR, HE, M43 SERIES (FRAGMENTS) EXPENDED	OE Scrap
OE-15 MOCO 02	G 23	-6	1	PROJECTILE, 60mm, MORTAR, ILLUMINATING, M83 SERIES (PRIMER) LIVE	UXO
OE-15 MOCO 02	G 23	0		PROJECTILE, 60mm, MORTAR, ILLUMINATING, M83 SERIES (FRAGMENTS) EXPENDED	OE Scrap
OE-15 MOCO 02	G 24	-10	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 MOCO 02	G 24	0		FRAGMENTS, UNKNOWN EXPENDED	OE Scrap
OE-15 MOCO 02	G 24	0		PROJECTILE, 37mm, LE, MK I (FRAGMENTS) EXPENDED	OE Scrap
OE-15 MOCO 02	G 24	0		PROJECTILE, 81mm, MORTAR, HE, M43 SERIES (FRAGMENTS) EXPENDED	OE Scrap
OE-15 MOCO 02	G 24	-6	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 MOCO 02	G 24	0		PROJECTILE, 37mm, LE, MK I (FRAGMENTS) EXPENDED	OE Scrap
OE-15 MOCO 02	G 24	0		PROJECTILE, 81mm, MORTAR, HE, M43 SERIES (FRAGMENTS) EXPENDED	OE Scrap
OE-15 MOCO 02	G 25	-6	2	PROJECTILE, 105mm, HE, M1 (FRAGMENTS) EXPENDED	OE Scrap
OE-15 MOCO 02	G 25	-6	2	PROJECTILE, 105mm, HE, M1 (FRAGMENTS) EXPENDED	OE Scrap
OE-15 MOCO 02	G 25	0		FRAGMENTS, UNKNOWN EXPENDED	OE Scrap
OE-15 MOCO 02	G 25	-6	2	PROJECTILE, 37mm, LE, MK I (FRAGMENTS) EXPENDED	OE Scrap
OE-15 MOCO 02	G 25	-4	1	PROJECTILE, 105mm, HE, M1 (FRAGMENT) EXPENDED	OE Scrap
OE-15 MOCO 02	G 25	-3	1	PROJECTILE, 37mm, LE, MK I (FRAGMENT) EXPENDED	OE Scrap
OE-15 MOCO 02	G 25	-5	2	PROJECTILE, 37mm, LE, MK I (FRAGMENTS) EXPENDED	OE Scrap
OE-15 MOCO 02	G 25	-4	1	PROJECTILE, 37mm, LE, MK I (FRAGMENT) EXPENDED	OE Scrap
OE-15 MOCO 02	G 25	-3	1	PROJECTILE, 37mm, LE, MK I (FRAGMENT) EXPENDED	OE Scrap
OE-15 MOCO 02	G 25	-4	1	PROJECTILE, 37mm, LE, MK I (FRAGMENT) EXPENDED	OE Scrap
OE-15 MOCO 02	G 25	-4	1	PROJECTILE, 75mm, SHRAPNEL, MK I (SCRAP) EXPENDED	OE Scrap
OE-15 MOCO 02	G 25	-2	1	PROJECTILE, 37mm, LE, MK I (FRAGMENT) EXPENDED	OE Scrap
OE-15 MOCO 02	G 25	-3	1	PROJECTILE, 37mm, LE, MK I (FRAGMENT) EXPENDED	OE Scrap
OE-15 MOCO 02	G 25	-3	1	PROJECTILE, 37mm, LE, MK I (FRAGMENT) EXPENDED	OE Scrap
OE-15 MOCO 02	G 25	-4	1	PROJECTILE, 37mm, LE, MK I (FRAGMENT) EXPENDED	OE Scrap
OE-15 MOCO 02	G 25	-6	1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES (FRAGMENT) EXPENDED	OE Scrap
OE-15 MOCO 02	G 25	-4	1	PROJECTILE, 37mm, LE, MK I (FRAGMENT) EXPENDED	OE Scrap
OE-15 MOCO 02	G 25	-4	1	PROJECTILE, 37mm, LE, MK I (FRAGMENT) EXPENDED	OE Scrap
OE-15 MOCO 02	G 25	-3	1	PROJECTILE, 37mm, LE, MK I (FRAGMENT) EXPENDED	OE Scrap
OE-15 MOCO 02	G 25	-4	1	PROJECTILE, 37mm, LE, MK I (FRAGMENT) EXPENDED	OE Scrap
OE-15 MOCO 02	G 25	-3	1	PROJECTILE, 37mm, LE, MK I (FRAGMENT) EXPENDED	OE Scrap

Table 2. Ranges 43 through 48, UXO and OE Scrap Discovered During Investigations
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Site Number	Grid Number	Depth (Inches)	QTY	Ordnance	Status
OE-15 MOCO 02	G 25	-4	1	PROJECTILE, 37mm, LE, MK I (FRAGMENT) EXPENDED	OE Scrap
OE-15 MOCO 02	G 26	0		FRAGMENTS, UNKNOWN EXPENDED	OE Scrap
OE-15 MOCO 02	G 26	-3	1	FUZE, GRENADE, HAND, M206A1 EXPENDED	OE Scrap
OE-15 MOCO 02	G 26	-6	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 MOCO 02	G 26	0		PROJECTILE, 155mm, HE, M107 (NORMAL & DEEP CAVITY) (FRAGMENTS) EXPENDED	OE Scrap
OE-15 MOCO 02	G 26	-3	1	FUZE, GRENADE, HAND, M206A1 EXPENDED	OE Scrap
OE-15 MOCO 02	G 26	-2	1	FUZE, GRENADE, HAND, M206A1 EXPENDED	OE Scrap
OE-15 MOCO 02	G 26	-6	1	GRENADE, HAND, SMOKE, COLORED, M48 EXPENDED	OE Scrap
OE-15 MOCO 02	G 26	-4	1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15 MOCO 02	G 26	0	1	CARTRIDGE, 40mm, PRACTICE, M212 LIVE	UXO
OE-15 MOCO 02	G 26	0	1	CARTRIDGE, 40mm, PRACTICE, M212 LIVE	UXO
Site Specific Sampling, Seaside 4					
OE-15 SEA 04	17 X	-3	4	CARTRIDGE, IGNITION, M2 SERIES LIVE	OE Scrap
OE-15 SEA 04	17 X	-1	1	FIRING, DEVICE, PRESSURE, M1A1 EXPENDED	OE Scrap
OE-15 SEA 04	17 X	-24	1	ROCKET, 2.36 INCH, PRACTICE, M7 SERIES EXPENDED	OE Scrap
OE-15 SEA 04	17 X	-12	1	PROJECTILE, 75mm, SHRAPNEL, MK I LIVE	UXO
OE-15 SEA 04	17 X	-2	1	FUZE, GRENADE, HAND, PRACTICE, M228 EXPENDED	OE Scrap
OE-15 SEA 04	17 X	-24	1	GRENADE, RIFLE, AT, PRACTICE, M11 EXPENDED	OE Scrap
OE-15 SEA 04	17 X	-6	1	FUZE, GRENADE, HAND, PRACTICE, M228 EXPENDED	OE Scrap
OE-15 SEA 04	19 AD	-3	1	FUZE, GRENADE, HAND, PRACTICE, M228 EXPENDED	OE Scrap
OE-15 SEA 04	19 AD	-2	1	FUZE, GRENADE, HAND, PRACTICE, M228 EXPENDED	OE Scrap
OE-15 SEA 04	19 AD	0		2 LBS, FRAGMENTS, UNKNOWN EXPENDED	OE Scrap
OE-15 SEA 04	19 W	-6	1	GRENADE, HAND, PRACTICE, DELAY, M30 EXPENDED	OE Scrap
OE-15 SEA 04	21 AI	0		1 LBS, FRAGMENTS, UNKNOWN EXPENDED	OE Scrap
OE-15 SEA 04	22 AF	-1	1	SIGNALS, ILLUMINATION, HAND, FIRED, COMET 1260 (CANADIAN) EXPENDED	OE Scrap
OE-15 SEA 04	24 AJ	-1	1	FUZE, PROJECTILE, COMBINATION, M1907 EXPENDED	OE Scrap
OE-15 SEA 04	24 AJ	-4	1	PROJECTILE, 57mm, HE, M306 SERIES LIVE	UXO
OE-15 SEA 04	24 AJ	-6	1	PROJECTILE, 57mm, HE, M306 SERIES LIVE	UXO
OE-15 SEA 04	24 AM	-6	1	ROCKET, 3.5 INCH , PRACTICE, M29A2 EXPENDED	OE Scrap
OE-15 SEA 04	24 AM	-6	1	GRENADE, HAND, PRACTICE, MK 2 EXPENDED	OE Scrap
OE-15 SEA 04	24 AM	-4	2	ROCKET, 3.5 INCH , PRACTICE, M29A2 EXPENDED	OE Scrap
OE-15 SEA 04	24 AM	-6	1	PROJECTILE, 81mm, MORTAR, ILLUMINATING, M301 SERIES EXPENDED	OE Scrap
OE-15 SEA 04	24 AM	-8	1	PROJECTILE, 81mm, MORTAR, ILLUMINATING, M301 SERIES EXPENDED	OE Scrap
OE-15 SEA 04	24 AM	-2	2	ROCKET, 3.5 INCH , PRACTICE, M29A2 (ROCKET MOTOR) EXPENDED	OE Scrap
OE-15 SEA 04	26 AN	-18	1	GRENADE, HAND, PRACTICE, MK 2 EXPENDED	OE Scrap
OE-15 SEA 04	26 AN	-3	1	FIRING, DEVICE, RELEASE, M1 EXPENDED	OE Scrap
Range 44 Sampling					
OE-15	RNG 44 03 04		1	GRENADE, HAND, INCENDIARY, TH3, AN-M14 LIVE	UXO
OE-15	RNG 44 05 B	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15	RNG 44 05 B	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO

Table 2. Ranges 43 through 48, UXO and OE Scrap Discovered During Investigations
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OE-15	RNG 44 05 B	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15	RNG 44 05 B	0	1	ROCKET, 66mm, HEAT, M72, M72A1, M72A2 & M72A3 (FUZE) LIVE	UXO
OE-15	RNG 44 05 B	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15	RNG 44 05 B	0	1	ROCKET, 66mm, HEAT, M72, M72A1, M72A2 & M72A3 LIVE	UXO
OE-15	RNG 44 05 B	0	1	ROCKET, 66mm, HEAT, M72, M72A1, M72A2 & M72A3 (FUZE) LIVE	UXO
OE-15	RNG 44 05 B	0	1	ROCKET, 66mm, HEAT, M72, M72A1, M72A2 & M72A3 (FUZE) LIVE	UXO
OE-15	RNG 44 05 B	0	1	ROCKET, 66mm, HEAT, M72, M72A1, M72A2 & M72A3 (FUZE) LIVE	UXO
OE-15	RNG 44 05 B	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15	RNG 44 05 B	0	1	PROJECTILE, 40mm, HE, M386 LIVE	UXO
OE-15	RNG 44 05 B	0	1	ROCKET, 66mm, HEAT, M72, M72A1, M72A2 & M72A3 LIVE	UXO
OE-15	RNG 44 05 B	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15	RNG 44 05 B	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15	RNG 44 05 B	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15	RNG 44 05 B	0	1	ROCKET, 66mm, HEAT, M72, M72A1, M72A2 & M72A3 LIVE	UXO
OE-15	RNG 44 05 B	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15	RNG 44 05 B	0	10	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15	RNG 44 05 B	0	8	ROCKET, 66mm, HEAT, M72, LIVE	UXO
OE-15	RNG 44 05 B	0	5	ROCKET, 66mm, HEAT, M72, LIVE	UXO
OE-15	RNG 44 05 B	0	6	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15	RNG 44 05 B	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
Range 45 Sampling					
OE-15	RNG 45	0	2	PROJECTILE, 40mm, HE, M381 LIVE	UXO
OE-15	RNG 45	0	1	RAW PYROTECHNIC MIXTURE LIVE	UXO
OE-15	RNG 45	0	3	PROJECTILE, 40mm, PARACHUTE, WHITE STAR, M583A1 LIVE	UXO
OE-15	RNG 45	0	3	ROCKET, 66mm, INCENDIARY, TPA, M74 LIVE	UXO
OE-15	RNG 45	0	2	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15	RNG 45	0	7	PROJECTILE, 40mm, GROUND MARKER GREEN SMOKE M715 LIVE	UXO
OE-15	RNG 45	0	2	PROJECTILE, 40mm, CS, M651 LIVE	UXO
OE-15	RNG 45	0	2	PROJECTILE, 40mm, GROUND, MARKER GREEN SMOKE M715 LIVE	UXO
OE-15	RNG 45	0	4	PROJECTILE, 40mm, GROUND MARKER RED SMOKE, M713 LIVE	UXO
OE-15	RNG 45	0	1	PROJECTILE, 40mm, FUZE LIVE	UXO
OE-15	RNG 45	0	3	PROJECTILE, 40mm, HE, M381 LIVE	UXO
OE-15	RNG 45	0	1	CARTRIDGE, 40mm, PRACTICE, M212 LIVE	UXO
OE-15	RNG 45	0	1	PROJECTILE, 40mm, GROUND MARKER RED SMOKE, M713 LIVE	UXO
OE-15	RNG 45	0	1	RAW PYROTECHNIC MIXTURE LIVE	UXO
OE-15	RNG 45	0	2	PROJECTILE, 40mm, CANOPY, WHITE SMOKE, M680 LIVE	UXO
OE-15	RNG 45	0	5	PROJECTILE, 40mm, GROUND MARKER GREEN SMOKE M715 LIVE	UXO
OE-15	RNG 45	0	2	CARTRIDGE, 40mm, PRACTICE, M212 LIVE	UXO
OE-15	RNG 45	0	3	PROJECTILE, 40mm, HE, M381 LIVE	UXO
OE-15	RNG 45	0	2	PROJECTILE, 40mm, HE, M381 LIVE	UXO
OE-15	RNG 45	0	1	PROJECTILE, 40mm, HEDP, M430 LIVE	UXO
OE-15	RNG 45	0	1	PROJECTILE, 40mm, HEDP, M430 LIVE	UXO

Table 2. Ranges 43 through 48, UXO and OE Scrap Discovered During Investigations
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Site Number	Grid Number	Depth (Inches)	QTY	Ordnance	Status
OE-15	RNG 45	0	1	PROJECTILE, 40mm, HEDP, M430 LIVE	UXO
OE-15	RNG 45	0		150 LBS, PROJECTILE, 40mm, HE\ SMOKE\ DUMMY& PRACTICE (SCRAP) EXPENDED	OE Scrap
OE-15	RNG 45	0	2	PROJECTILE, 40mm, C.S. M651 LIVE	UXO
OE-15	RNG 45	0	4	PROJECTILE, 40mm, GROUND MARKER GREEN SMOKE M715, PARTIAL LIVE	UXO
OE-15	RNG 45	0	1	PROJECTILE, 40mm, HEDP, M433 LIVE	UXO
OE-15	RNG 45	0	2	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 LIVE	UXO
OE-15	RNG 45	0	2	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15	RNG 45	0	1	PROJECTILE, 40mm, HE, M381 LIVE	UXO
OE-15	RNG 45	0	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 LIVE	UXO
OE-15	RNG 45	0		150 LBS, PROJECTILE, 40mm, HE\ SMOKE\ DUMMY& PRACTICE (SCRAP) EXPENDED	OE Scrap
OE-15	RNG 45	0	1	PROJECTILE, 40mm, HE, M381 LIVE	UXO
OE-15	RNG 45	0	3	PROJECTILE, 40mm, HE, M397 LIVE	UXO
OE-15	RNG 45	0	528	PROJECTILE, 40mm, Practice, M781 EXPENDED	OE Scrap
OE-15	RNG 45	0	1	ROCKET, 66mm, INCENDIARY, TPA, M74, (ROCKET MOTOR AND FUZE ONLY) FUZE LIVE	UXO
OE-15	RNG 45	0	2	PROJECTILE, 40mm, HE, M381 LIVE	UXO
OE-15	RNG 45	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15	RNG 45	0	1	RAW PYROTECHNIC MIXTURE LIVE	UXO
OE-15	RNG 45	0	4	PROJECTILE, 40mm, GROUND MARKER RED SMOKE, M713 LIVE	UXO
OE-15	RNG 45	0	1	PROJECTILE, 40mm, CS, M651 LIVE	UXO
OE-15	RNG 45	0	1	PROJECTILE, 40mm, HEDP M433 LIVE	UXO
OE-15	RNG 45	0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15	RNG 45	0	1	SIGNALS, ILLUMINATION, GROUND, PARACHUTE, RED STAR, M126A1 LIVE	UXO
OE-15	RNG 45	0	412	PROJECTILE, 40mm, PRACTICE, M781 EXPENDED	OE Scrap
OE-15	RNG 45	0	1	PROJECTILE, 40mm, CS, M651 LIVE	UXO
OE-15	RNG 45	0	612	PROJECTILE, 40mm, PRACTICE, M781 EXPENDED	OE Scrap
OE-15	RNG 45	0	5	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 LIVE	UXO
OE-15	RNG 45	0	3	PROJECTILE, 40mm, HE, M397 LIVE	UXO
OE-15	RNG 45	0	1	PROJECTILE, 40mm, PARACHUTE, WHITE STAR, M583A1 LIVE	UXO
OE-15	RNG 45	0	1	PROJECTILE, 40mm, PARACHUTE, WHITE STAR, M583A1 LIVE	UXO
Range 46 Lead Remediation Removal					
OE-15 SEA 04	26 AP	-14	1	FUZE, PROJECTILE, COMBINATION, M1907 EXPENDED	OE Scrap
OE-15 SEA 04	26 AP	-6	1	GRENADE, HAND, PRACTICE, MK 2 EXPENDED	OE Scrap
OE-15 SEA 04	23 AR	0	1	GRENADE, HAND, SMOKE, HC, AN-M8 LIVE	UXO
Additional Fuel Break Data					
OE-15	MAVERICK ROAD		1	GRENADE, HAND, SMOKE, WP, M15 LIVE	UXO
OE-15	MAVERICK ROAD		3	PROJECTILE, 57mm, HE, M306 SERIES LIVE	UXO
OE-15	MAVERICK ROAD		1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES LIVE	UXO
OE-15 EDCBND	EDC 12 (MOCO 02)	-10	1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 EXPENDED	OE Scrap
OE-15 EDCBND	FB E06 (MOCO 02)		1	PROJECTILE, 40mm, PRACTICE, M781 LIVE	UXO
OE-15 EDCBND	FB E06 (MOCO 02)		1	GRENADE, HAND, PRACTICE, MK 2 EXPENDED	OE Scrap

Table 2. Ranges 43 through 48, UXO and OE Scrap Discovered During Investigations
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OE-15 EDCBND	FB E06 (MOCO 02)		1	PROJECTILE, 40mm, PRACTICE, M781 LIVE	UXO
OE-15 EDCBND	FB E10 (MOCO 02)		1	FLARE, SURFACE, TRIP, M49A1 LIVE	UXO
OE-15 EDCBND	FB E10 (MOCO 02)		1	PROJECTILE, 22mm, SUB-CALIBER, PRACTICE, M744 LIVE	UXO
OE-15 EDCBND	FB E11 (MOCO 02)		1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap
OE-15 EDCBND	FB E11 (MOCO 02)		1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73 EXPENDED	OE Scrap
OE-15 EDCBND	FB E12 (MOCO 02)		1	PROJECTILE, 75mm, SHRAPNEL, MK1 EXPENDED	OE Scrap
OE-15 EDCBND	FB E12 (MOCO 02)		1	FUZE, PROJECTILE, POINT DETONATING, M48 SERIES LIVE	UXO
OE-15 EDCBND	FB E15 (MOCO 02)		1	ROCKET, 2.36 INCH, PRACTICE, M7 SERIES EXPENDED	OE Scrap
OE-15 EDCBND	FB W01 (MOCO 02)		2	PROJECTILE, 40mm, HE, M381 LIVE	UXO
OE-15 EDCBND	FB W02 (MOCO 02)		1	PROJECTILE, 40mm, HE, M381 LIVE	UXO
OE-15 EDCBND	FB W02 (MOCO 02)		1	PROJECTILE, 40mm, HE, M381 (FRAGMENT BALL) LIVE	UXO
OE-15 EDCBND	FB W06 (MOCO 02)			4 LBS, PROJECTILE, 40mm, HE (FRAGMENTS) EXPENDED	OE Scrap
OE-15 EDCBND	FB W07 (MOCO 02)			3 LBS, GRENADE, RIFLE, 40mm, HE (FRAGMENTS) EXPENDED	OE Scrap
Surface Removal, Time Critical Removal Action					
RANGES 43-48		0	1	PROJECTILE, 37mm, PRACTICE, M63	OE Scrap
RANGES 43-48		0	1	PROJECTILE, 37mm, HE, M63	UXO
RANGES 43-48		0	1	PROJECTILE, 37mm, HE, M54	UXO
RANGES 43-48		0	17	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES	UXO
RANGES 43-48		0	72	PROJECTILE, 60mm, MORTAR, PRACTICE, M50 SERIES	OE Scrap
RANGES 43-48		0	1	PROJECTILE, 60mm, MORTAR, ILLUMINATING, M83 SERIES	UXO
RANGES 43-48		0	16	PROJECTILE, 57mm, TP, M306 SERIES	OE Scrap
RANGES 43-48		0	43	PROJECTILE, 57mm, HE, M306 SERIES	UXO
RANGES 43-48		0	1	PROJECTILE, 57mm, HEAT, M307	UXO
RANGES 43-48		0	41	PROJECTILE, 40mm, PRACTICE, M918	UXO
RANGES 43-48		0	6	PROJECTILE, 40mm, PRACTICE, M781	UXO
RANGES 43-48		0	6	PROJECTILE, 40mm, PRACTICE, M407A1	UXO
RANGES 43-48		0	5	PROJECTILE, 40mm, HE, M383	UXO
RANGES 43-48		0	25	PROJECTILE, 40mm, HE, M381	UXO
RANGES 43-48		0	2	PROJECTILE, 40mm, HE, M384	UXO
RANGES 43-48		0	1	PROJECTILE, 40mm, HE, M441	UXO
RANGES 43-48		0	1	PROJECTILE, 40mm, HE, M386	UXO
RANGES 43-48		0	1	PROJECTILE, 40mm, HEDP, M433	UXO
RANGES 43-48		0	1	PROJECTILE, 40mm, SMOKE, M713 SERIES	UXO
RANGES 43-48		0	1	PROJECTILE, 40mm, PARACHUTE, STAR, M662	UXO
RANGES 43-48		0	1	PROJECTILE, 30mm, TP, M788	OE Scrap
RANGES 43-48		0	7	PROJECTILE, 22mm, SUBCALIBER, PRACTICE, M744	UXO
RANGES 43-48		0	1	PROJECTILE, 4.2 INCH, MORTAR, HE, M329 SERIES	UXO
RANGES 43-48		0	1	PROJECTILE, 75mm, HE, M48	UXO
RANGES 43-48		0	4	PROJECTILE, 75mm, HE, M41A1	UXO
RANGES 43-48		0	2	PROJECTILE, 75mm, SHRAPNEL, MK1	UXO
RANGES 43-48		0	14	PROJECTILE, 81mm, MORTAR, PRACTICE, M43 SERIES	OE Scrap
RANGES 43-48		0	3	PROJECTILE, 81mm, MORTAR, HE, M43 SERIES	UXO

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RANGES 43-48		0	1	PROJECTILE, 81mm, MORTAR, HE M374A3	UXO
RANGES 43-48		0	1	PROJECTILE, 81mm, MORTAR, HE, M362	UXO
RANGES 43-48		0	1	PROJECTILE, 81mm, MORTAR, ILLUMINATING, M301 SERIES	UXO
RANGES 43-48		0	94	PROJECTILE, 84mm, HEAT, M136 SERIES	UXO
RANGES 43-48		0	7	PROJECTILE, 90mm, HEAT, M348	UXO
RANGES 43-48		0	7	PROJECTILE, 90mm, HEAT, M371A1	UXO
RANGES 43-48		0	1	PROJECTILE, 155mm, ILLUMINATING, M485 SERIES	UXO
RANGES 43-48		0	1749	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73	UXO
RANGES 43-48		0	1	ROCKET, 2.36 INCH, PRACTICE, M7	UXO
RANGES 43-48		0	4	ROCKET, 2.36 INCH, ANTITANK, HE, M6	OE Scrap
RANGES 43-48		0	1	ROCKET, 3.5 INCH, PRACTICE, M29 SERIES	OE Scrap
RANGES 43-48		0	165	ROCKET, 66mm, HEAT, M72 SERIES	UXO
RANGES 43-48		0	25	ROCKET, 66mm, INCENDIARY, TPA, M74	UXO
RANGES 43-48		0	5	ROCKET, 66mm, INCENDIARY, TPA, M74	OE Scrap
RANGES 43-48		0	14	ROCKET MOTOR, M222 (DRAGON)	OE Scrap
RANGES 43-48		0	2	ROCKET MOTOR, M222 (DRAGON)	UXO
RANGES 43-48		0	1	ROCKET, 83mm, HEAT, (SMAW)	OE Scrap
RANGES 43-48		0	2	MISSILE, GUIDED, PRACTICE, M231 (DRAGON)	OE Scrap
RANGES 43-48		0	11	MISSILE, GUIDED, PRACTICE, M231 (DRAGON)	UXO
RANGES 43-48		0	1	GRENADE, HAND SMOKE, WP, M15	UXO
RANGES 43-48		0	1	GRENADE, HAND SMOKE, M18 SERIES	UXO
RANGES 43-48		0	2	GRENADE, HAND, ILLUMINATING, MK1	UXO
RANGES 43-48		0	1	FIRING DEVICE, RELEASE, M1	UXO
RANGES 43-48		0	76	FUZE, GRENADE, HAND, M10 SERIES	UXO
RANGES 43-48		0	1	FUZE, BOMB, NOSE, M103	UXO
RANGES 43-48		0	1	SIGNAL, ILLUMINATION, GROUND, SLAP FLARE, M125 SERIES	UXO
RANGES 43-48		0	1	FLARE, SURFACE, TRIP, M49 SERIES	UXO
RANGES 43-48		0	1	SIMULATOR, FLASH, ARTILLERY, M110	UXO

Table 3. Range 30A, UXO and OE Scrap Discovered During Investigations
Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord, California
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Site Number	Grid Number	Depth (Inches)	Quantity	Pounds (LBS)	Ordnance	Status
MRA Grid Sampling						
OE-15B	G 40	12	1		PROJECTILE, 76mm, CANISTER, M363 LIVE	UXO
OE-15B	G 40	8	1		PROJECTILE, 57mm, TP, M306A1 EXPENDED	OE Scrap
OE-15B	G 40	8	1		PROJECTILE, 37mm, TP, M63 EXPENDED	OE Scrap
OE-15B	G 40	8	1		PROJECTILE, 76mm, CANISTER, M363 EXPENDED	OE Scrap
OE-15B	G 40	3	1		PROJECTILE, 76mm, CANISTER, M363 EXPENDED	OE Scrap
OE-15B	G 40	6	1		PROJECTILE, 37mm, TP, M63 EXPENDED	OE Scrap
OE-15B	G 40	6	1		PROJECTILE, 37mm, TP, M63 EXPENDED	OE Scrap
Fuel Break Clearance						
Nowhere Rd.	NRI124	4	1		PROJECTILE, 60mm, MORTAR, ILLUMINATION, M83 SERIES	OE Scrap
Nowhere Rd.	NRI124	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI124	5	1		PROJECTILE, 37mm, LE, MK I	OE Scrap
Nowhere Rd.	NRI124	5	1		FUZE, PROJECTILE, POINT DETONATING, MK VI	OE Scrap
Nowhere Rd.	NRI125	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI125	1	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI125	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI125	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI125	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI125	1	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI125	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI125	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI126	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI126	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI126	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI126	8	1		PROJECTILE, 60mm, MORTAR, ILLUMINATION, M83 SERIES	OE Scrap
Nowhere Rd.	NRI120L	0		15	FRAGMENTS, UNKNOWN	Frag
Nowhere Rd.	NRI121L	3	1		PROJECTILE, 37mm, APT, M51 SERIES	OE Scrap
Nowhere Rd.	NRI121L	0		20	FRAGMENTS, UNKNOWN	Frag
Nowhere Rd.	NRI122L	5	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI122L	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI122L	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI122L	8	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Nowhere Rd.	NRI122L	0		10	FRAGMENTS, UNKNOWN	Frag
Nowhere Rd.	NRI123L	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI123L	4	4		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI123L	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI123L	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI123L	0		20	FRAGMENTS, UNKNOWN	Frag
Nowhere Rd.	NRI127	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI128	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI128	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI128	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI128	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI128	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI128	9	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI128	7		1	PROJECTILE, 60mm, MORTAR, SMOKE, WP, M302 SERIES (FRAGMENTS)	Frag
Nowhere Rd.	NRI129	10	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI129	8	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI129	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI129	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI129	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI129	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Orion Rd.	ORI040	4	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI040	6	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI040	8	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI040	18	1		PROJECTILE, 155mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI040	6	1		PROJECTILE, 81mm, MORTAR, ILLUMINATION, M301 SERIES	OE Scrap
Orion Rd.	OR040	0	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	OR040	0	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Orion Rd.	OR041	0	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Orion Rd.	OR042	0	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Orion Rd.	OR042	0	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap

Site Number	Grid Number	Depth (Inches)	Quantity	Pounds (LBS)	Ordnance	Status
Orion Rd.	OR043	0	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	OR044	0	1		PROJECTILE, 37mm, APT, M51 SERIES	OE Scrap
Orion Rd.	OR045	0	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Orion Rd.	OR045	0	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Orion Rd.	OR039	0	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	OR039	0	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI158	6	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI158	8	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI158	15	1		PROJECTILE, 37mm, APT, M51 SERIES	OE Scrap
Nowhere Rd.	NRI158	2	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Nowhere Rd.	NRI158	4	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Nowhere Rd.	NRI158	3	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Nowhere Rd.	NR123	0	7		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NR123	0	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Nowhere Rd.	NR125	0	9		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NR125	0	2		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NR125	0	76		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	4	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Nowhere Rd.	NRI134	24	1		PROJECTILE, 4.2 INCH, MORTAR, ILLUMINATION, M335 SERIES	OE Scrap
Nowhere Rd.	NRI134	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	7	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	7	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	7	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	8	2		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	7	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	7	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	7	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	6	2		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	7	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap

Table 3. Range 30A, UXO and OE Scrap Discovered During Investigations
Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
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Site Number	Grid Number	Depth (Inches)	Quantity	Pounds (LBS)	Ordnance	Status
Nowhere Rd.	NRI134	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	7	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	7	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	1	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Darwin Rd.	DA030	0	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Darwin Rd.	DAI024	2	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Darwin Rd.	DAI024	5	1		PROJECTILE, 37mm, APC, M59 SERIES	OE Scrap
Darwin Rd.	DAI019	0	1		GRENADE, HAND, SMOKE, M18 SERIES	OE Scrap
Darwin Rd.	DAI019	2	1		GRENADE, HAND, SMOKE, WP, M15 SERIES	OE Scrap
Nowhere Rd.	NR141	0	41		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR141	0	2		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NR142	0	14		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR142	0	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NR142	0	1		PROJECTILE, 155mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NR143	0	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR133	0	62		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR133	0	4		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NR133	0	1		PROJECTILE, 60mm, MORTAR, ILLUMINATION, M83 SERIES	OE Scrap
Nowhere Rd.	NR134	0	116		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR134	0	1		PROJECTILE, 37mm, APT, M51 SERIES	OE Scrap
Nowhere Rd.	NR135	0	8		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR135	0	3		PROJECTILE, 60mm, MORTAR, HE, M49 SERIES (FINS ONLY)	OE Scrap
Nowhere Rd.	NRI131L	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI131L	4	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Nowhere Rd.	NRI131L	0		25	FRAGMENTS, UNKNOWN	Frag
Nowhere Rd.	NRI132	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI132	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI132	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI133	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI133	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI133	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI133	1	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI130	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI130	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI130	0		20	FRAGMENTS, UNKNOWN	Frag
Darwin Rd.	DAI015	4	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Darwin Rd.	DAI015	5	1		PROJECTILE, 37mm, APT, M51 SERIES	OE Scrap
Darwin Rd.	DAI015	10	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Darwin Rd.	DAI015	10	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Darwin Rd.	DAI002	7	1		PROJECTILE, 37mm, APT, M51 SERIES	OE Scrap
Darwin Rd.	DAI002	4	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Darwin Rd.	DAI002	6	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Darwin Rd.	DAI028	2	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Darwin Rd.	DAI029	6	1		GRENADE, HAND, RIOT, CN, M7A1	UXO
Darwin Rd.	DAI029	6	1		GRENADE, HAND, SMOKE, M18 SERIES	UXO
Nowhere Rd.	NRI136	8	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI136	5	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI136	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI136	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI136	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI136	7	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI136	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI136	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI137	7	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI137	9	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI137	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap

Table 3. Range 30A, UXO and OE Scrap Discovered During Investigations
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Site Number	Grid Number	Depth (Inches)	Quantity	Pounds (LBS)	Ordnance	Status
Nowhere Rd.	NRI137	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI137	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI137	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI137	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI137	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI137	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI137	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI137	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI137	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI138	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI138	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI139	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI139	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI139	7	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI139	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI139	7	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI139	5	1		PROJECTILE, 37mm, HE, MK II	UXO
Nowhere Rd.	NRI140	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI140	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI140	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI140	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI140	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI140	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI140	7	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI140	8	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI136	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI136	7	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI136	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI136	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI136	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI136	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI136	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI133	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI133	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR136	0	1		PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Nowhere Rd.	NR136	0	5		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR137	0	19		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR138	0	14		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR138	0	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NR139	0	2		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR140	0	6		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	4	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI135	2	1		PROJECTILE, 37mm, APT, M51 SERIES	OE Scrap
Nowhere Rd.	NRI135	6	1		FUZE, PROJECTILE, POWDER, TRAIN, TIME, M84A1	OE Scrap
Nowhere Rd.	NRI135	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Darwin Rd.	DAI018	0	1		GRENADE, HAND, SMOKE, M18 SERIES	OE Scrap
Darwin Rd.	DAI019	0	1		GRENADE, HAND, SMOKE, M18 SERIES	OE Scrap
Nowhere Rd.	NR143	0	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR145	0	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NR150	0	1		PROJECTILE, 60mm, MORTAR (FINS ONLY)	OE Scrap
Nowhere Rd.	NR150	0	1		PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Nowhere Rd.	NR152	0	1		PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Nowhere Rd.	NR154	0	1		PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Nowhere Rd.	NR155	0			PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Nowhere Rd.	NR155	0	1		PROJECTILE, 60mm, MORTAR (FINS ONLY)	OE Scrap
Nowhere Rd.	NR156	0	2		PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Nowhere Rd.	NR157	0	2		PROJECTILE, 60mm, MORTAR (FINS ONLY)	OE Scrap
Nowhere Rd.	NR157	0	1		PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Nowhere Rd.	NR157	0	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NR158	0	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	OR047	0	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap

Table 3. Range 30A, UXO and OE Scrap Discovered During Investigations
Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord, California
Working Draft 10/4/01

Site Number	Grid Number	Depth (Inches)	Quantity	Pounds (LBS)	Ordnance	Status
Orion Rd.	OR054	0	1		PROJECTILE, 60mm, MORTAR (FINS ONLY)	OE Scrap
Orion Rd.	OR056	0	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	OR056	0	1		PROJECTILE, 81mm, MORTAR, ILLUMINATION (FINS ONLY)	OE Scrap
Orion Rd.	OR059	0	1		PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Orion Rd.	OR060	0	1		PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Orion Rd.	OR060	0	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI142	18	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI142	1	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI142	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI142	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI142	1	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI142	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI142	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI142	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI142	1	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI142	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI142	1	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI143	6	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI143	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI143	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI143	1	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Darwin Rd.	DA003	0	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Darwin Rd.	DA043	0	1		PROJECTILE, 37mm, APT, M51 SERIES	OE Scrap
Darwin Rd.	DA058	0	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Darwin Rd.	DAI001	7	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Darwin Rd.	DAI001	9	1		PROJECTILE, 37mm, APT, M51 SERIES	OE Scrap
Darwin Rd.	DAI039	1	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Darwin Rd.	DAI039	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Darwin Rd.	DAI012	4	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Darwin Rd.	DAI012	18	1		PROJECTILE, 37mm, APT, M51 SERIES	OE Scrap
Nowhere Rd.	NRI151	4	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI151	3	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI152	5	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI152	3	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI152	10	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Nowhere Rd.	NRI152	2	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Nowhere Rd.	NRI153	2	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Nowhere Rd.	NRI153	4	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Nowhere Rd.	NRI153	5	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Nowhere Rd.	NRI153	2	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Nowhere Rd.	NRI153	6	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Nowhere Rd.	NRI153	5	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI153	8	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI153	9	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI153	2	1		PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Nowhere Rd.	NRI155	2	1		FUZE, PROJECTILE, BASE DETONATING, M58 SERIES	OE Scrap
Nowhere Rd.	NRI155	6	1		PROJECTILE, 37mm, APT, M51 SERIES	OE Scrap
Nowhere Rd.	NRI155	8		1	PROJECTILE, 60mm, MORTAR, SMOKE, WP, M302 SERIES (FRAGMENTS)	Frag
Nowhere Rd.	NRI155	4	1		PROJECTILE, 75mm, SHRAPNEL, MK I	UXO
Nowhere Rd.	NRI155	5	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Nowhere Rd.	NRI155	5	1		FUZE, PROJECTILE, POINT DETONATING, M527 SERIES	OE Scrap
Nowhere Rd.	NRI155	4	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Nowhere Rd.	NRI155	5	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Nowhere Rd.	NRI156	12	1		PROJECTILE, 75mm, SHRAPNEL, MK I (W/O FUZE	UXO
Nowhere Rd.	NRI156	5	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Nowhere Rd.	NRI156	4	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Nowhere Rd.	NRI156	5	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Nowhere Rd.	NRI156	2	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Nowhere Rd.	NRI156	4	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Nowhere Rd.	NRI156	5	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Nowhere Rd.	NRI156	6	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Nowhere Rd.	NRI156	13	1		PROJECTILE, 37mm, APT, M51 SERIES	OE Scrap
Nowhere Rd.	NRI156	5	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Nowhere Rd.	NRI156	3	1		FUZE, PROJECTILE, BASE DETONATING, M38 SERIES	OE Scrap

Site Number	Grid Number	Depth (Inches)	Quantity	Pounds (LBS)	Ordnance	Status
Nowhere Rd.	NRI155	2	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Nowhere Rd.	NRI155	NA	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Nowhere Rd.	NRI155	NA	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Nowhere Rd.	NRI155	NA	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Nowhere Rd.	NRI155	NA	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Nowhere Rd.	NRI155	NA	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Nowhere Rd.	NRI155	NA	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI155	NA	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI155	NA	1		FUZE, PROJECTILE, POWDER, TRAIN, TIME, M84A1	OE Scrap
Nowhere Rd.	NRI155	NA	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Nowhere Rd.	NRI154	12	1		PROJECTILE, 155mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI154	5	1		FUZE, PROJECTILE, TIME DETONATING, SUPER QUICK, M54 SERIES	OE Scrap
Nowhere Rd.	NRI154	4	1		PROJECTILE, 60mm, MORTAR (FINS ONLY)	OE Scrap
Nowhere Rd.	NRI154	3	1		PROJECTILE, 60mm, MORTAR (FINS ONLY)	OE Scrap
Nowhere Rd.	NRI154	5	1		PROJECTILE, 60mm, MORTAR (FINS ONLY)	OE Scrap
Nowhere Rd.	NRI154	6	1		PROJECTILE, 60mm, MORTAR (FINS ONLY)	OE Scrap
Nowhere Rd.	NRI154	8	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI154	5	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Nowhere Rd.	NRI154	3	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Nowhere Rd.	NRI158	2	1		FUZE, PROJECTILE, BASE DETONATING, M58 SERIES	OE Scrap
Nowhere Rd.	NRI157	5	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Orion Rd.	ORI040	30	1		PROJECTILE, 8 INCH, HE, M106 SERIES	UXO
Orion Rd.	ORI040	5	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	ORI040	4	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	ORI040	5	1		FUZE, PROJECTILE, MECHANICAL, TIME & SUPERQUICK, M54 SERIES	OE Scrap
Orion Rd.	ORI040	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Orion Rd.	ORI040	4	1		FUZE, PROJECTILE, BASE DETONATING, M58 SERIES	OE Scrap
Orion Rd.	ORI040	5	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI040	6	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI040	4	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI040	1	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI040	5	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI040	6	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI040	5	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI040	4	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI040	6	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI040	9	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI040	6	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI040	8	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI040	7	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI040	8	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI040	5	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	ORI040	4	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	ORI040	3	1		FUZE, PROJECTILE, POINT DETONATING, M26 SERIES	OE Scrap
Orion Rd.	ORI041	7	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI041	5	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI041	24	1		PROJECTILE, 155mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI041	5	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI041	4	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Nowhere Rd.	NRI135	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	1	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	1	2		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	7	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	7	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap

Site Number	Grid Number	Depth (Inches)	Quantity	Pounds (LBS)	Ordnance	Status
Nowhere Rd.	NRI135	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	1	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	1	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	6	2		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	5	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	7	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI135	6	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI134	7	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Darwin Rd.	DAI037	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Darwin Rd.	DAI037	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Darwin Rd.	DAI037	3	1		FUZE, PROJECTILE, POINT DETONATING, MK III	OE Scrap
Nowhere Rd.	NRI145	6	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI145	3	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI145	6	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Nowhere Rd.	NRI145	2	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Nowhere Rd.	NRI145	5	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI145	5	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI144	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI144	1	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Orion Rd.	ORI041	6	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI041	2	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI041	5	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI041	6	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI041	8	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI041	3	1		FUZE, PROJECTILE, BASE DETONATING, M38 SERIES	OE Scrap

Table 3. Range 30A, UXO and OE Scrap Discovered During Investigations
Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord, California
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Site Number	Grid Number	Depth (Inches)	Quantity	Pounds (LBS)	Ordnance	Status
Orion Rd.	ORI041	4	1		FUZE, PROJECTILE, BASE DETONATING, M38 SERIES	OE Scrap
Orion Rd.	ORI041	3	1		FUZE, PROJECTILE, BASE DETONATING, M38 SERIES	OE Scrap
Orion Rd.	ORI041	5	1		FUZE, PROJECTILE, POINT DETONATING, M5 SERIES	OE Scrap
Orion Rd.	ORI041	4	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	ORI041	8	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI041	7	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI041	8	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI041	4	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Orion Rd.	ORI041	6	1		PROJECTILE, 60mm, MORTAR (TAIL BOOM ASSEMBLY)	OE Scrap
Orion Rd.	ORI042	1	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI042	4	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI042	3	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	ORI042	2	1		FUZE, PROJECTILE, BASE DETONATING, M38 SERIES	OE Scrap
Nowhere Rd.	NRI134	8	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI144	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI144	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI144	6	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI144	10	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI144	6	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI144	5	1		PROJECTILE, 75mm, HE, COMMON, MK I	UXO
Nowhere Rd.	NR123	0	56		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Evolution Rd.	EV066	0	4		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Evolution Rd.	EV059	0	3		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Evolution Rd.	EV059	0	1		PROJECTILE, 37mm, APT, M51 SERIES	OE Scrap
Evolution Rd.	EV054	0	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Evolution Rd.	EV054	0	2		PROJECTILE, 37mm, APT, M51 SERIES	OE Scrap
Evolution Rd.	EV052	0	13		SIGNAL, ILLUMINATION, GROUND, PARACHUTE, WHITE STAR, M127A1	OE Scrap
Evolution Rd.	EV052	0	1		PROJECTILE, 81mm, MORTAR, TARGET PRACTICE, M43 SERIES	OE Scrap
Evolution Rd.	EV052	0		1	PROJECTILE, 60mm, MORTAR, HE, M49 SERIES (FRAGMENTS)	Frag
Nowhere Rd.	NRI148	0		4	FRAGMENTS, UNKNOWN	Frag
Nowhere Rd.	NRI141	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI141	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI141	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI141	4	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI141	1	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI141	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI141	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI141	3	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI141	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR148	0	4		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NR148	0	2		PROJECTILE, 81mm, MORTAR, ILLUMINATION (BODY ONLY)	OE Scrap
Nowhere Rd.	NRI146	2	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NRI146	4	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI146	2	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI146	4	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI146	4	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI146	3	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI146	0		10	FRAGMENTS, UNKNOWN	Frag
Nowhere Rd.	NRI147	6	1		PROJECTILE, 155mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI147	4	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI147	4	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI147	2	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI147	2	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI147	6	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Nowhere Rd.	NRI147	4	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Nowhere Rd.	NRI147	2	1		PROJECTILE, 37mm, APT, M51 SERIES	OE Scrap
Nowhere Rd.	NRI147	1	1		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Darwin Rd.	DAI001	6	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Darwin Rd.	DAI004	4	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Darwin Rd.	DAI004	5	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Darwin Rd.	DAI004	4	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Nowhere Rd.	NRI148	4	1		PROJECTILE, 37mm, APT, M51 SERIES	OE Scrap
Nowhere Rd.	NRI148	18	1		PROJECTILE, 37mm, APT, M51 SERIES	OE Scrap
Nowhere Rd.	NRI148	10	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap

Table 3. Range 30A, UXO and OE Scrap Discovered During Investigations
Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
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Site Number	Grid Number	Depth (Inches)	Quantity	Pounds (LBS)	Ordnance	Status
Nowhere Rd.	NRI148	5		1	PROJECTILE, 60mm, MORTAR, SMOKE, WP, M302 SERIES (FRAGMENTS)	Frag
Nowhere Rd.	NRI148	7	1		FUZE, PROJECTILE, TIME DETONATING, SUPER QUICK, M54 SERIES	OE Scrap
Nowhere Rd.	NRI149	4	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI149	4	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI149	4	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI149	8	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Nowhere Rd.	NRI149	18		20	PROJECTILE, 155mm, HE (FRAGMENTS)	Frag
Nowhere Rd.	NRI149	15	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI149	8	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI149	6	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI149	7	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI149	4	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI150	5	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI150	6	1		PROJECTILE, 60mm, MORTAR (FINS ONLY)	OE Scrap
Nowhere Rd.	NRI150	8	1		PROJECTILE, 60mm, MORTAR (FINS ONLY)	OE Scrap
Nowhere Rd.	NRI150	5	1		PROJECTILE, 60mm, MORTAR (FINS ONLY)	OE Scrap
Nowhere Rd.	NRI150	5	1		PROJECTILE, 60mm, MORTAR (FINS ONLY)	OE Scrap
Nowhere Rd.	NRI150	8	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI150	6	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI151	5	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI151	6	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI151	8	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI151	6	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Nowhere Rd.	NRI151	8	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Nowhere Rd.	NRI151	5	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Darwin Rd.	DAI006	4	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Darwin Rd.	DAI006	6	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Darwin Rd.	DAI007	4	1		PROJECTILE, 37mm, APT, M51 SERIES	OE Scrap
Darwin Rd.	DAI007	6	1		PROJECTILE, 37mm, LE, MK I	UXO
Orion Rd.	ORI044	0		4	FRAGMENTS, UNKNOWN	Frag
Orion Rd.	ORI044	2	1		FUZE, PROJECTILE, BASE DETONATING, MK I	UXO
Orion Rd.	ORI044	4	1		FUZE, PROJECTILE, BASE DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI044	1	1		FUZE, PROJECTILE, BASE DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI044	1	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI044	0		40	FRAGMENTS, UNKNOWN	Frag
Orion Rd.	ORI042	8	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI042	2	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	ORI042	6	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	ORI042	0		15	FRAGMENTS, UNKNOWN	Frag
Orion Rd.	ORI043	2	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI043	6	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI043	6	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI043	0		25	FRAGMENTS, UNKNOWN	Frag
Orion Rd.	ORI041	12	1		PROJECTILE, 155mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI041	9	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	ORI041	4	1		FUZE, PROJECTILE, POINT DETONATING, M III	OE Scrap
Orion Rd.	ORI041	4	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI041	5	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	ORI042	8	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI042	6	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI042	8	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI042	2	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI042	5	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI042	3	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	ORI042	4	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	ORI042	2	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	ORI042	5	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	ORI043	20	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI043	2	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI043	6	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI043	6	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI043	4	1		FUZE, PROJECTILE, POINT DETONATING, MK VI	OE Scrap
Orion Rd.	ORI043	2	1		FUZE, PROJECTILE, POINT DETONATING, MK VI	OE Scrap
Orion Rd.	ORI043	0		30	FRAGMENTS, UNKNOWN	Frag

Table 3. Range 30A, UXO and OE Scrap Discovered During Investigations
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Site Number	Grid Number	Depth (Inches)	Quantity	Pounds (LBS)	Ordnance	Status
Orion Rd.	ORI044	2	1		FUZE, PROJECTILE, POINT DETONATING, MK V	OE Scrap
Orion Rd.	ORI044	20	1		PROJECTILE, 81mm, MORTAR, ILLUMINATION, M301 SERIES	UXO
Orion Rd.	ORI044	16	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI044	0		5	FRAGMENTS, UNKNOWN	Frag
Orion Rd.	ORI045	6	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	ORI045	6	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI045	6	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI047	0		20	FRAGMENTS, UNKNOWN	Frag
Orion Rd.	ORI046	3	1		FUZE, PROJECTILE, POINT DETONATING, M46 SERIES	OE Scrap
Orion Rd.	ORI046	4	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI045	0		50	FRAGMENTS, UNKNOWN	Frag
Orion Rd.	ORI045	3	1		FUZE, PROJECTILE, POINT DETONATING, M46 SERIES	OE Scrap
Orion Rd.	ORI045	4	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI059	3	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI059	5	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI059	4	1		FUZE, PROJECTILE, BASE DETONATING, MK I	OE Scrap
Orion Rd.	ORI059	0		8	FRAGMENTS, UNKNOWN	Frag
Orion Rd.	ORI060	3	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	ORI060	4	1		PROJECTILE, 60mm, MORTAR, SMOKE, WP (FINS ONLY)	OE Scrap
Orion Rd.	ORI060	3	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	ORI060	1	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI060	0		7	FRAGMENTS, UNKNOWN	Frag
Orion Rd.	ORI061	4	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI061	0		4	FRAGMENTS, UNKNOWN	Frag
Orion Rd.	ORI056	3	1		PROJECTILE, 81mm, MORTAR, SMOKE (FINS ONLY)	OE Scrap
Orion Rd.	ORI056	3	1		PROJECTILE, 81mm, MORTAR, SMOKE (FINS ONLY)	OE Scrap
Orion Rd.	ORI056	5	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	ORI056	3	1		PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Orion Rd.	ORI056	0		7	FRAGMENTS, UNKNOWN	Frag
Orion Rd.	ORI057	28	1		PROJECTILE, 155mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI057	1	1		PROJECTILE, 60mm, MORTAR, HE, M49 SERIES (FINS ONLY)	OE Scrap
Orion Rd.	ORI048	0		70	FRAGMENTS, UNKNOWN	Frag
Orion Rd.	ORI047	4	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI047	4	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI047	0		19	FRAGMENTS, UNKNOWN	Frag
Orion Rd.	ORI058	18	1		PROJECTILE, 60mm, MORTAR, SMOKE, WP, M302 SERIES	UXO
Orion Rd.	ORI058	3	1		PROJECTILE, 81mm, MORTAR, HE (FINS ONLY)	OE Scrap
Orion Rd.	ORI058	8	1		PROJECTILE, 60mm, MORTAR, HE, M49 SERIES (FINS ONLY)	OE Scrap
Orion Rd.	ORI058	0		6	FRAGMENTS, UNKNOWN	Frag
Orion Rd.	ORI056	6	1		PROJECTILE, 60mm, MORTAR, SMOKE, WP, M722 SERIES (FINS ONLY)	OE Scrap
Orion Rd.	ORI055	3	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI054	10	1		PROJECTILE, 81mm, MORTAR, ILLUMINATION, M301A3	OE Scrap
Orion Rd.	ORI054	6	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI048	0		29	FRAGMENTS, UNKNOWN	Frag
Orion Rd.	ORI048	3	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	OR037	0	2		PROJECTILE, 155mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	OR037	0	5		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	OR037	0	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	OR033	0	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	OR032	0	1		PROJECTILE, 40mm, PRACTICE, M382 SERIES	OE Scrap
Orion Rd.	OR031	0	1		SIGNAL, ILLUMINATION, GROUND, SLAP, FLARE, M126 SERIES	OE Scrap
Orion Rd.	OR031	0	1		SIGNAL, ILLUMINATION, GROUND, SLAP, FLARE, M126 SERIES	OE Scrap
Orion Rd.	OR027	0	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	OR027	0	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	OR027	0	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	OR027	0	1		PROJECTILE, 105mm, HE, M1 SERIES	OE Scrap
Orion Rd.	OR020	0	1		PROJECTILE, 40mm, SMOKE, M680 SERIES	OE Scrap
Orion Rd.	OR020	0	1		PROJECTILE, 155mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI053	36	1		PROJECTILE, 4.2 INCH, MORTAR, ILLUMINATION, M335 SERIES	OE Scrap
Orion Rd.	ORI052	3	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	ORI052	0		5	FRAGMENTS, UNKNOWN	Frag
Orion Rd.	ORI051	6	1		FUZE, PROJECTILE, POINT DETONATING, M46 SERIES	OE Scrap
Orion Rd.	ORI051	2	1		FUZE, PROJECTILE, BASE DETONATING, MK I	OE Scrap
Orion Rd.	ORI051	3	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap

Table 3. Range 30A, UXO and OE Scrap Discovered During Investigations
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Site Number	Grid Number	Depth (Inches)	Quantity	Pounds (LBS)	Ordnance	Status
Orion Rd.	ORI051	6	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI051	3	1		FUZE, PROJECTILE, TIME DETONATING, SUPER QUICK, M54 SERIES	OE Scrap
Orion Rd.	ORI051	8	1		FUZE, PROJECTILE, COMBINATION, M1907	OE Scrap
Orion Rd.	ORI051	4	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI051	0		15	FRAGMENTS, UNKNOWN	Frag
Orion Rd.	ORI050	0		20	FRAGMENTS, UNKNOWN	Frag
Orion Rd.	ORI050	3	1		FUZE, PROJECTILE, POINT DETONATING, M46 SERIES	OE Scrap
Orion Rd.	ORI050	4	1		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
Orion Rd.	ORI050	0		15	FRAGMENTS, UNKNOWN	Frag
Orion Rd.	ORI049	5	1		FUZE, PROJECTILE, COMBINATION, M1914	OE Scrap
Orion Rd.	ORI049	2	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI049	3	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES	OE Scrap
Orion Rd.	ORI049	0		20	FRAGMENTS, UNKNOWN	Frag
Nowhere Rd.	NR126	NA	NA		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR126	NA	NA		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR126	NA	NA		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR126	NA	NA		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR127	NA	NA		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR127	NA	NA		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR129	NA	NA		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR129	NA	NA		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR130	NA	NA		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR130	NA	NA		PROJECTILE, 40mm, PRACTICE, M918 SERIES	OE Scrap
Nowhere Rd.	NR128	NA	NA		PROJECTILE, 75mm, SHRAPNEL, MK I	OE Scrap
OE-15	EVO RD 1-19	-12	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15	EVO RD 1-19	-8	1		PROJECTILE, 37mm, AP-C, M59 EXPENDED	OE Scrap
OE-15	EVO RD 1-19	-3	1		PROJECTILE, 37mm, AP-C, M59 EXPENDED	OE Scrap
OE-15	EVO RD 1-19	-6	1		FUZE, PROJECTILE, POINT DETONATING, M48 SERIES EXPENDED	OE Scrap
OE-15	EVO RD 31-33	-8	1		FUZE, PROJECTILE, COMBINATION, M1907 EXPENDED	OE Scrap
OE-15	EVO RD 31-33	-4	1		PROJECTILE, 37mm, AP-T, M51 SERIES EXPENDED	OE Scrap
OE-15	EVO RD 31-33	-6	2		PROJECTILE, 37mm, AP-T, M51 SERIES EXPENDED	OE Scrap
OE-15	EVO RD 37-39	-6	2		PROJECTILE, 75mm, SHRAPNEL, MK1 EXPENDED	OE Scrap
OE-15	EVO RD 41-43	-3	1		PROJECTILE, 37mm, AP-T, M51 SERIES EXPENDED	OE Scrap
OE-15	EVO RD 51-53	-14	1		PROJECTILE, 75mm, SHRAPNEL, MK1 LIVE	UXO
OE-15	EVO RD 51-53	-8	1		FUZE, PROJECTILE, COMBINATION, M1907 EXPENDED	OE Scrap
OE-15	SPRINGER RD 39-41	-6	1		FUZE, PROJECTILE, POINT DETONATING, M51 EXPENDED	OE Scrap
Surface Removal, Time Critical Removal Action						
OE-15		0	1		PROJECTILE,40mm, HE M381	UXO
OE-15		0	1		PROJECTILE, 4.2 INCH, MORTAR, HE M3A1	UXO
OE-15		0	5		PROJECTILE, 60mm, MORTAR, PRACTICE, M50 SERIES	OE Scrap
OE-15		0	1		PROJECTILE, 75mm, SHRAPNEL, MK1	UXO
OE-15		0	4		PROJECTILE, 81mm, MORTAR, HE, M43, SERIES	UXO
OE-15		0	427		PROJECTILE, 81mm, MORTAR, PRACTICE, M43 SERIES	OE Scrap

Table 4. OE-16, UXO and OE Scrap Discovered During Investigations
Interim Action Ordnance and Exposives Remedial Investigation/Feasibility Study
Former Fort Ord, California
Working Draft 10/4/01

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status	
Fuel Break Clearance						
OE-15 EDCBND	FB W16-01	-8	1	GRENADE, HAND, SMOKE, HC, AN-M8 EXPENDED	OE Scrap	
OE-15 EDCBND	FB 16-01	-6	1	MINE, ANTITANK, PRACTICE, LIGHT, M1 EXPENDED		FALSE
OE-15 EDCBND	FB 16-01	-6	1	MINE, ANTITANK, PRACTICE, LIGHT, M1 EXPENDED		FALSE
OE-15 EDCBND	FB 16-01	-6	1	MINE, ANTITANK, PRACTICE, LIGHT, M1 LIVE		TRUE
OE-15 EDCBND	FB 16-01	-6	1	MINE, ANTITANK, PRACTICE, LIGHT, M1 LIVE		TRUE
OE-15 EDCBND	FB 16-01	-6	12	MINE, ANTITANK, PRACTICE, LIGHT, M1 LIVE		TRUE
OE-15 EDCBND	FB 16-01	-4	1	MINE, ANTITANK, PRACTICE, LIGHT, M1 LIVE		TRUE
OE-15 EDCBND	FB 16-01	-6	1	MINE, ANTITANK, PRACTICE, LIGHT, M1 LIVE		TRUE
OE-15 EDCBND	FB 16-01	-4	1	MINE, ANTITANK, PRACTICE, LIGHT, M1 LIVE		TRUE
OE-15 EDCBND	FB 16-01	-6	1	MINE, ANTITANK, PRACTICE, LIGHT, M1 LIVE		TRUE
OE-15 EDCBND	FB 16-01	-6	1	MINE, ANTITANK, PRACTICE, LIGHT, M1 LIVE		TRUE
OE-15 EDCBND	FB 16-01	-6	1	MINE, ANTITANK, PRACTICE, LIGHT, M1 LIVE		TRUE
OE-15 EDCBND	FB 16-01	-4	1	MINE, ANTITANK, PRACTICE, LIGHT, M1 LIVE		TRUE
OE-15 EDCBND	FB 16-01	-4	1	MINE, ANTITANK, PRACTICE, LIGHT, M1 LIVE		TRUE
OE-15 EDCBND	FB 16-02	-6	1	MINE, ANTITANK, PRACTICE, LIGHT, M1 LIVE		TRUE
OE-15 EDCBND	FB 16-02	-6	1	MINE, ANTITANK, PRACTICE, LIGHT, M1 LIVE		TRUE
OE-15 EDCBND	FB 16-02	-2	1	FUZE, GRENADE, HAND, M204 EXPENDED		FALSE
OE-15 EDCBND	FB 16-02	-2	1	MINE, ANTITANK, PRACTICE, LIGHT, M1 LIVE		TRUE
OE-15 EDCBND	FB 16-02	-2	1	FUZE, GRENADE, HAND, M204 EXPENDED		FALSE
OE-15 EDCBND	FB 16-02	-2	1	FUZE, GRENADE, HAND, M204 EXPENDED		FALSE
OE-15 EDCBND	FB 16-02	-2	1	MINE, ANTITANK, PRACTICE, LIGHT, M1 LIVE		TRUE
OE-15 EDCBND	FB 16-02	-4	1	FUZE, GRENADE, HAND, M204 EXPENDED		FALSE
OE-15 EDCBND	FB 16-02	-2	1	FUZE, GRENADE, HAND, M204 EXPENDED		FALSE
OE-15 EDCBND	FB 16-02	-4	1	FUZE, GRENADE, HAND, M204 EXPENDED		FALSE
OE-15 EDCBND	FB 16-02	-2	1	FUZE, GRENADE, HAND, M204 EXPENDED		FALSE
OE-15 EDCBND	FB 16-05	-4	1	FUZE, GRENADE, HAND, M204 EXPENDED		FALSE
OE-15 EDCBND	FB 16-05	-2	1	FUZE, GRENADE, HAND, M204 EXPENDED		FALSE
OE-15 EDCBND	FB 16-05	-2	1	FUZE, GRENADE, HAND, M204 EXPENDED		FALSE
OE-15 EDCBND	FB 16-05	-2	1	FUZE, GRENADE, HAND, M204 EXPENDED		FALSE
OE-15 EDCBND	FB 16-05	-6	1	ROCKET, 2.36 INCH, AT, M7 SERIES (MOTOR ONLY) EXPENDED		FALSE
OE-15 EDCBND	FB 16-05	-12	1	GRENADE, RIFLE, PRACTICE, M11A3 EXPENDED		FALSE
OE-15 EDCBND	FB 16-05	-4	1	FUZE, GRENADE, HAND, M204 EXPENDED		FALSE
OE-15 EDCBND	FB 16-05	-2	1	FUZE, GRENADE, HAND, M204 EXPENDED		FALSE
OE-15 EDCBND	FB 16-05	-2	1	FUZE, GRENADE, HAND, M204 EXPENDED		FALSE
OE-15 EDCBND	FB 16-05	-2	1	FUZE, GRENADE, HAND, M204 EXPENDED		FALSE
OE-15 EDCBND	FB 16-07	-7	1	FUZE, GRENADE, HAND, PRACTICE, M228 EXPENDED		FALSE
OE-15 EDCBND	FB 16-07	-6	1	UNKNOWN HEAVY CASE FRAGMENTS EXPENDED		FALSE
OE-15 EDCBND	FB 16-07	-5	2	SIGNALS, ILLUMINATION, GROUND, CLUSTERS, GREEN STAR, M125A1 EXPENDED		FALSE
OE-15 EDCBND	FB 16-07	-10	1	UNKNOWN HEAVY CASE FRAGMENTS EXPENDED		FALSE
OE-15 EDCBND	FB 16-07	-6	1	UNKNOWN HEAVY CASE FRAGMENTS EXPENDED		FALSE
OE-15 EDCBND	FB 16-07	-11	1	UNKNOWN HEAVY CASE FRAGMENTS EXPENDED		FALSE
OE-15 EDCBND	FB 16-08	-24	2	GRENADE, RIFLE, PRACTICE, M11A3 EXPENDED		FALSE

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-15 EDCBND	FB 16-08	-36	1	ROCKET, 2.36 INCH, AT, M6 SERIES EXPENDED	FALSE
OE-15 EDCBND	FB 16-08	-24	2	ROCKET, 2.36 INCH, AT, M7 SERIES (MOTOR ONLY) EXPENDED	FALSE
OE-15 EDCBND	FB 16-10	-6	1	GRENADE, RIFLE, PRACTICE, M11A3 EXPENDED	FALSE
OE-15 EDCBND	FB 16-12	-6	1	GRENADE, RIFLE, PRACTICE, M11A3 EXPENDED	FALSE
OE-15 EDCBND	FB 16-15	-6	1	GRENADE, HAND, SMOKE, HC, AN-M8 LIVE	TRUE
OE-15 EDCBND	FB 16-15	-4	1	FUZE, GRENADE, HAND, M204 EXPENDED	FALSE
OE-15 EDCBND	FB 16-15	-4	1	FUZE, GRENADE, HAND, M204 EXPENDED	FALSE
OE-15 EDCBND	FB 16-15	-2	1	SIGNALS, ILLUMINATION, GROUND, PARACHUTE, GREEN STAR, M19A2 EXPENDED	FALSE
OE-15 EDCBND	FB 16-17	-4	1	ROCKET, AT, 2.36 INCH, M6 SERIES LIVE	TRUE
OE-15 EDCBND	FB 16-19	-6	1	ROCKET, 2.36 INCH, AT, M6 SERIES EXPENDED	FALSE
OE-15 EDCBND	FB 16-19	-4	1	ROCKET, 2.36 INCH, AT, M6 SERIES EXPENDED	FALSE
OE-15 EDCBND	FB 16-19	-4	1	ROCKET, 2.36 INCH, AT, M6 SERIES EXPENDED	FALSE
OE-15 EDCBND	FB 16-20	-4	1	ROCKET, 2.36 INCH, AT, M6 SERIES EXPENDED	FALSE
OE-15 EDCBND	FB 16-20	-4	1	ROCKET, 2.36 INCH, AT, M6 SERIES EXPENDED	FALSE
OE-15 EDCBND	FB 16-20	-4	1	ROCKET, 2.36 INCH, AT, M6 SERIES EXPENDED	FALSE
OE-15 EDCBND	FB 16-20	-4	1	ROCKET, 2.36 INCH, AT, M6 SERIES EXPENDED	FALSE
OE-15 EDCBND	FB 16-20	-4	1	ROCKET, 2.36 INCH, AT, M6 SERIES EXPENDED	FALSE
OE-15 EDCBND	FB 16-21	-12	1	ROCKET, 2.36 INCH, AT, M6 SERIES LIVE	TRUE
OE-15 EDCBND	FB 16-21	-2	1	ROCKET, 2.36 INCH, AT, M6 SERIES LIVE	TRUE
OE-15 EDCBND	FB 16-21	-2	1	ROCKET, 2.36 INCH, AT, M6 SERIES EXPENDED	FALSE
OE-15 EDCBND	FB 16-21	-4	1	ROCKET, 2.36 INCH, AT, M6 SERIES EXPENDED	FALSE
OE-15 EDCBND	FB 16-21	-4	1	ROCKET, 2.36 INCH, AT, M6 SERIES EXPENDED	FALSE
OE-15 EDCBND	FB 16-21	-2	1	ROCKET, 2.36 INCH, AT, M6 SERIES EXPENDED	FALSE
OE-15 EDCBND	FB 16-23	-24	1	ROCKET, 2.36 INCH, AT, M6 SERIES LIVE	TRUE
OE-15 EDCBND	FB 16-25	-5	2	ROCKET, 2.36 INCH, AT, M6 SERIES LIVE	TRUE
OE-15 EDCBND	FB 16-25	-4	6	ROCKET, 2.36 INCH, PRACTICE, M7 SERIES EXPENDED	FALSE
OE-15 EDCBND	FB 16-25	-3	1	ROCKET, 2.36 INCH, PRACTICE, M7 SERIES EXPENDED	FALSE
OE-15 EDCBND	FB 16-25	-4	1	ROCKET, 2.36 INCH, PRACTICE, M7 SERIES EXPENDED	FALSE
OE-15 EDCBND	FB 16-26	-18	3	ROCKET, 2.36 INCH, AT, M6 SERIES LIVE	TRUE
OE-15 EDCBND	FB 16-26	-4	2	ROCKET, 2.36 INCH, AT, M6 SERIES LIVE	TRUE
OE-15 EDCBND	FB 16-26	-4	2	ROCKET, 2.36 INCH, PRACTICE, M7 SERIES EXPENDED	FALSE
OE-15 EDCBND	FB 16-28	-3	1	ROCKET, 2.36 INCH, AT, M6 SERIES LIVE	TRUE
OE-15 EDCBND	FB 16-29	-1	1	ROCKET, 2.36 INCH, AT, M6 SERIES LIVE	TRUE
OE-15 EDCBND	FB 16-29	-1	1	PROJECTILE, 37mm, TP, M63 LIVE	TRUE
OE-15 EDCBND	FB 16-31	-8	6	ROCKET, 2.36 INCH, AT, M6 SERIES LIVE	TRUE
OE-15 EDCBND	FB 16-31	-12	2	ROCKET, 2.36 INCH, AT, M6 SERIES LIVE	TRUE
OE-15 EDCBND	FB 16-31	-6	1	GRENADE, RIFLE, SMOKE, GREEN, RED, VIOLET OR YELLOW, M22 SERIES LIVE	TRUE
OE-15 EDCBND	FB 16-31	-12	9	ROCKET, 2.36 INCH, AT, M6 SERIES LIVE	TRUE
OE-15 EDCBND	FB 16-31	-6	11	GRENADE, RIFLE, SMOKE, GREEN, RED, VIOLET OR YELLOW, M22 SERIES EXPENDED	FALSE
OE-15 EDCBND	FB 16-31	-12	3	ROCKET, 2.36 INCH, AT, M6 SERIES EXPENDED	FALSE
OE-15 EDCBND	FB 16-31	-15	3	ROCKET, 2.36 INCH, AT, M6 SERIES LIVE	TRUE
OE-15 EDCBND	FB 16-31	-12	3	ROCKET, 2.36 INCH, AT, M6 SERIES LIVE	TRUE
OE-15 EDCBND	FB 16-33	-6	1	MINE, ANTITANK, PRACTICE, LIGHT, M1 LIVE	TRUE
OE-15 EDCBND	FB 16-33	-6	12	MINE, ANTITANK, PRACTICE, LIGHT, M1 LIVE	TRUE

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-15 EDCBND	FB 16-33	-4	1	ROCKET, 2.36 INCH, AT, M6 SERIES EXPENDED	FALSE
OE-15 EDCBND	FB 16-33	-6	1	GRENADE, RIFLE, AT, M9 & M9A1 EXPENDED	FALSE
OE-15 EDCBND	FB W16-05	-6	1	PROJECTILE, 37mm, HE, MK II LIVE	TRUE
OE-15 EDCBND	FB W16-05	-2	1	GRENADE, HAND, RIOT, CS, M7A3 EXPENDED	FALSE
ODDS Field Trial, Site OE-16					
OE-16 ODDS	FT4-01	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-01	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-01	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-01	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-01	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-01	NA	1	Fuze, Grenade, Hand, Practice, M228	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-01	NA	1	Fuze, Grenade, Hand, Practice, M228	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-01	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-01	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Hand, Practice, MK2	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Simulator, Explosive, Booby Trap, Flash, M118	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Simulator, Explosive, Booby Trap, Flash, M118	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, Practice, M11	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, AT, M9 Series (Tail Boom Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-02	NA	1	Grenade, Rifle, Practice, M11 (Tail Boom)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	11	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	6	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	7	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	4	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	4	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, AT, M6 Series	UXO (Live)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	34	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	5	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)

Table 4. OE-16, UXO and OE Scrap Discovered During Investigations
Interim Action Ordnance and Exposives Remedial Investigation/Feasibility Study
Former Fort Ord, California
Working Draft 10/4/01

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	7	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Grenade, Rifle, Practice, M11	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Grenade, Rifle, AT, M9 Series	UXO (Live)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)

Table 4. OE-16, UXO and OE Scrap Discovered During Investigations
Interim Action Ordnance and Exposives Remedial Investigation/Feasibility Study
Former Fort Ord, California
Working Draft 10/4/01

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Grenade, Hand, Smoke, M18	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Grenade, Rifle, Practice, M11	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Fuze, Grenade, Rifle, AT, M9	UXO (Live)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (W/H Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (W/H Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (W/H Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Grenade, Hand, Practice, MK2	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	4	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	4	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	9	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	5	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	5	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	13	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	4	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	40	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	4	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	6	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	4	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	4	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Grenade, Rifle, AT, M9 Series	UXO (Live)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (W/H Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	5	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	5	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	4	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (W/H Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)

Table 4. OE-16, UXO and OE Scrap Discovered During Investigations
Interim Action Ordnance and Exposives Remedial Investigation/Feasibility Study
Former Fort Ord, California
Working Draft 10/4/01

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	5	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	15	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, AT, M6 Series (Fuze)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	4	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	4	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Fuze, Grenade, Rifle, AT, M9	UXO (Live)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Grenade, Rifle, AT, M9 Series	UXO (Live)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	12	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)

Table 4. OE-16, UXO and OE Scrap Discovered During Investigations
Interim Action Ordnance and Exposives Remedial Investigation/Feasibility Study
Former Fort Ord, California
Working Draft 10/4/01

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 3.5 Inch, Practice, M29 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 3.5 Inch, Practice, M29 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-03	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series (Motor Only)	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	4	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	3	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)

Table 4. OE-16, UXO and OE Scrap Discovered During Investigations
Interim Action Ordnance and Exposives Remedial Investigation/Feasibility Study
Former Fort Ord, California
Working Draft 10/4/01

Site Number	Grid Number	Depth (inches)	Quantity	Ordnance	Status
OE-16 ODDS	FT4-04	NA	2	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	1	Rocket Motor, 2.36 Inch, Practice, M7 Series	OES-E (Scrap, Expended)
OE-16 ODDS	FT4-04	NA	4	Rocket Motor, 2.36 Inch, Practice, M7 Series (PIT)	OES-E (Scrap, Expended)
Surface Removal, Time Critical Removal Action					
OE-16		0	2	SIMULATOR, LAUNCHING, ANTITANK MISSLE, M22	UXO
OE-16		0	1	ROCKET, 2.36 INCH, AT, HE, M6	UXO
OE-16		0	2	ROCKET, 2.36 INCH, PRACTICE, M7	OE Scrap
OE-16		0	1	ROCKET, 35mm, PRACTICE, SUBCALIBER, M73	UXO
OE-16		0	1	SIMULATOR, FLASH, ARTILLERY, M110	UXO

Table 5. Potential Applicable or Relevant and Appropriate Requirements (ARARS)
Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord, California

Source or Authority	Requirement, Standard, Or Criterion	Type	Description	Remarks
			Federal ARARs and TBCs	
Endangered Species Act (16 USC §§ 1531–1543)	16 USC § 1536 (a) and (c); 16 USC § 1538 (a)(1)	Applicable (1,2,3)* / Location	Federal agencies are required under Section 7 of the ESA to insure that their actions do not jeopardize the continued existence of a listed species or result in destruction of adverse modification of its critical habitat (16 USC § 1536). If the proposed action may affect the listed species or its critical habitat, consultation with the USFWS and/or California Fish and Game may be required (50 CFR § 402.14). Additionally, Section 9 of the ESA prohibits the illegal taking of a listed species (16 USC§ 1538(a)(1).	The requirement includes specific standards of control. It also includes non-substantive procedural and administrative provisions with which the Army, under CERCLA, is not required to comply. The Army has completed an endangered species, Section 7 consultation, and the USFWS has issued a Biological Opinion for the Army disposal and reuse actions at Fort Ord. Endangered plant and animal species and critical habitats occur at Fort Ord. Each OE site will be screened for potential impacts to any endangered species identified in the April 1997 Habitat Management Plan for the former Fort Ord. The report recommends measures to ensure compliance with this ARAR.
Migratory Bird Treaty Act (MBTA)	16 U.S.C. §§703-712	Applicable (1,2,3) / Location	The statute sections prohibit the taking, possession of, buying, selling, purchasing, or bartering of any migratory bird, including feathers or other parts, nest eggs, or products, except as allowed by regulations.	The requirement includes specific standards of control.
Hazardous Materials & Transportation Act	49 CFR Part 172.101	Applicable (3) / Chemical and Action	These regulations impose procedures and controls on the transportation of hazardous materials.	The regulations include specific standards of control and substantive requirements, criteria and limitations that may apply to the transport of detonation materials and selected recyclable ordnance materials.
U.S. EPA	Interim Air Quality Policy on Wildland and Prescribed Fires	TBC (1)	Applies to Wildland and Prescribed Fires managed to achieve resource benefits. Provides guidance to land managers and others regarding smoke management plans and other procedural provisions.	The policy provides planning guidance that may pertain to site preparation and clearance.
Federal Resource Conservation and Recovery Act (RCRA), Subpart M (Military Munitions Rule)	40 CFR Parts 266 and 270	Relevant and Appropriate (2, 3) / Chemical and Action	The regulations identify when military munitions become a solid waste, and if these wastes are hazardous, the management standards that apply.	The rule is not applicable; however, it will be evaluated to determine whether it is relevant or appropriate with respect to the proposed remedial alternative.
			Other Federal Regulations, Statutes, etc., considered and eliminated during the identification of ARARs and TBCs	
Fish and Wildlife Coordination Act 16 USC §661-666(c)	(16 USC §§661 et seq.; 662, 663)		The statute sections provide that Federal agencies should consult with the appropriate agency and state personnel to develop protective measures for affected fish and wildlife.	Not an ARAR. The statute sections do not define a specific standard of control or a substantive requirement, criterion or limitation.
National Historic Preservation Act, as amended (16 USC §36 CFR 470(a-w).	36 CFR §800.3(a)(1); 36 CFR §800.5(a); 36 CFR §800.2(c) 36 CFR §800.2(a)(4); 36 CFR §800.3(c); E.O. 11593(TBC)		The statute sections apply to undertakings (actions) that will impact historic properties on or eligible to be on the National Register of Historic Places.	Not an ARAR. The scale and approach of the IA are such that historic properties are not expected to be encountered.

Source or Authority	Requirement, Standard, Or Criterion	Type	Description	Remarks
			Other Federal Regulations, Statutes, etc., considered and eliminated during the identification of ARARs and TBCs (cont'd)	
Archaeological and Historic Preservation Act	16 USC §469-469a-2		The statute sections provide for the preservation of historical and archaeological data that would be lost due to alterations of the terrain.	Not an ARAR. The statute sections do not define a specific standard of control or a substantive requirement, criterion or limitation. Further, the scale and approach of the IA are such that historical and archaeological resources are not expected to be encountered.
Archaeological Resources Protection Act of 1979 as amended (16 USC §470)	32 CFR §229.4(a) 32 CFR §229.5(b)		The regulations provide that the excavation, removal, damage, altering or defacing of archaeological resources is prohibited unless by permit or exception; requires Phase II archaeological investigation prior to actions taking place at discovered site.	Not an ARAR. The regulations do not define a specific standard of control or a substantive requirement, criterion or limitation. Further, the scale and approach of the IA are such that archaeological resources are not expected to be encountered.
Clean Water Act	33 U.S.C. 1151 et seq., 1251 et seq.		The statute sections establish programs, policies and objectives governing all untreated waters including marine, estuarine, fresh surface water, and groundwater.	Not an ARAR. The scale and approach of the IA are such that waters of the United States are not expected to be affected.
Clean Water Act, §404(b)(1)	40 CFR Part 230.10		These requirements provide for a permit from the Army for construction activities in wetlands and alternative analysis to ensure selection of the least damaging practicable alternative.	Not an ARAR. Consists of non-substantive procedural and administrative requirements with which the Army, under CERCLA, is not required to comply.
Executive Order 11990 "Protection of Wetlands"	EO 11990		Action must be taken to minimize adverse impacts on wetlands.	Not an ARAR. The scale and approach of the IA is such that waters of the United States are not expected to be affected.
Federal Clean Air Act	42 U.S.C. 7401 et seq.; 40 CFR Part 50 et seq.		These requirements establish primary and secondary air quality standards necessary to protect health, welfare, and plant and animal life.	Not an ARAR. As ambient standards, the extent of contribution, if any, of IA activities to meeting or exceeding the standards' concentrations versus the contributions of area or regional sources cannot be determined. The standards themselves do not apply to individual sources.
Hazard Communication	29 CFR Part 1910.1200		This regulation specifies that the hazards associated with all chemicals produced or imported be evaluated, and that information concerning their hazards be transmitted to employers and employees.	Not an ARAR. This regulation is not promulgated under environmental or facility siting laws.
			State of California ARARs and TBCs	
California Endangered Species Act	Fish and Game Code §§ 2051 et seq.; §2080.	Applicable (1,2,3) / Location	The statute sections provide a declaration of policy and definitions. Section 2080 provides that no person shall take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the commission determines to be an endangered species or a threatened species, or attempt any of those acts.	Section 2080 includes specific standards of control with respect to the taking of endangered or threatened species. Under CERCLA, the Army is not required to comply with non-substantive policy, procedural and administrative provisions of §2051.
California Fish and Game Code	§3005	Applicable (1,2,3) / Location	The statute section prohibits the taking of birds or mammals, except non-game mammals, with any net, pound, cage, trap, set line or wire, or poisonous substance. Included in the term "taking" is the killing of birds or mammals by poison.	The requirement includes specific standards of control.

Table 5. Potential Applicable or Relevant and Appropriate Requirements (ARARS)
Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord, California

Source or Authority	Requirement, Standard, Or Criterion	Type	Description	Remarks
			State of California ARARs and TBCs (cont'd)	
California Fish and Game Code	§3511	Applicable (1,2,3) / Location	This statute section prohibits taking or possessing fully protected birds or parts thereof, listed as: (a) American peregrine falcon (Falco peregrinus anatum) (b) Brown pelican (c) California black rail (Laterallus jamaicensis coturniculus) (d) California clapper rail (Rallus longirostris obsoletus) (e) California condor (Gymnogyps californianus) (f) California least tern (Sterna albifrons browni) (g) Golden eagle (h) Greater sandhill crane (Grus canadensis tabida) (i) Light-footed clapper rail (Rallus longirostris levipes) (j) Southern bald eagle (Haliaeetus leucocephalus leucocephalus) (k) Trumpeter swan (Cygnus buccinator) (l) White-tailed kite (Elanus leucurus) (m) Yuma clapper rail (Rallus longirostris yumanensis)	The requirement includes specific standards of control that may apply to the American peregrine falcon (some possibility), golden eagle (slight possibility), brown pelican (not likely but possible), and California least tern (not likely but possible).
California Fish and Game Code	§3513	Applicable (1,2,3) / Location	This statute section declares that it is unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Treaty Act.	The requirement includes specific standards of control.
California Fish and Game Code	§3503.5	Applicable (1,2,3) / Location	This statute section prohibits the take, possession or destruction of any birds in the orders of Falconiformes or Strigiformes, or to take, possess, or destroy the nest or eggs of any such bird, except as provided in the code.	The requirement includes specific standards of control that may apply to vultures, hawks, ospreys, falcons and owls.
California Fish and Game Code	§4000 et. seq.	Applicable (1,2,3) / Location	This statute section provides that a fur-bearing mammal may be taken only with a trap, firearm, bow and arrow, poison under a proper permit, or with the use of dogs.	The requirement includes specific standards of control.
California Fish and Game Code	Title 14, CCR §472	Applicable (1,2,3) / Location	This regulation limits the taking of nongame birds and mammals except for specified species.	The requirement includes specific standards of control that may affect American crows.
California Fish and Game Code	§4800 et. seq.	Applicable (1,2,3) / Location	This statute section declares that it is unlawful to take, injure, possess, transport or sell any mountain lion.	The requirement includes specific standards of control.
California Fish and Game Code	Title 14, CCR §§40-42	Applicable (1,2,3) / Location	These regulations make it unlawful to take, possess, purchase, propagate, sell, transport, import, or export any native reptile or amphibian, unless under special permit	The requirement includes specific standards of control that may apply to California tiger salamander, western spadefoot, black legless lizard, and coast horned lizard.
California Fish and Game Code	Title 14, CCR §460	Applicable (1,2,3) / Location	This regulation makes it unlawful to take Fisher, marten, river otter, desert kit fox and red fox.	The requirement includes specific standards of control that may affect red fox.
California Clean Air Act (Health and Safety Code)	Monterey Bay Unified Air Pollution Control District Rule 407	Applicable (1,2,3) / Action	This rule provides substantive limitations regarding materials to be burned. The rule also includes procedural requirements, such as, the prohibition of burning poison oak, where in the opinion of the APCO, the smoke could adversely affect nearby residences.	The rule includes specific substantive limitations. It also includes non-substantive procedural and administrative provisions with which the Army, under CERCLA, is not required to comply.

Source or Authority	Requirement, Standard, Or Criterion	Type	Description	Remarks
			State of California ARARs and TBCs (cont'd)	
California Clean Air Act (Health and Safety Code)	Monterey Bay Unified Air Pollution Control District Rule 432	Applicable (1) / Action	The prohibitory rule describes permit requirements, allowable days for burning, and restrictions. The rule includes both substantive and procedural requirements regarding open burning.	The rule includes specific standards of control. It also includes non-substantive procedural and administrative provisions with which the Army, under CERCLA, is not required to comply.
California Clean Air Act	Health and Safety Code §41701	Applicable (1,2,3) / Location	This statute section prohibits the discharge into the atmosphere from any source whatsoever any air contaminant for a period or periods aggregated more than three minutes in any one hour which is dark or darker than No. 2 on the Ringelmann Chart or obscures the view to a degree equal to or greater than smoke.	The statute section includes specific standards of control.
California Health and Safety Code, Division 20	Title 22, CCR Division 4.5	Applicable (1,2,3) / Chemical and Action	The statute and regulations provide for identification of hazardous waste in §§66261. If a material is a hazardous waste, Division 4.5 provisions further regulate hazardous waste generators, transporters, and treatment, storage, and disposal facilities.	Standard would become applicable to the management of the material if the material is determined to be hazardous pursuant to the regulation.
California Health and Safety Code	Title 22, CCR §66264.601-603; §66264.553	Applicable (3) / Chemical and Action	These regulations apply to hazardous waste treatment which is conducted in a device that does not meet the definition of a "container" in 22 CCR 66260.10 is characterized as a "Miscellaneous Unit" subject to the provisions of 22 CCR 66264.601-603. For activities where detonations are in a device that meet the 22 CCR 66260.10 definition of a container, the requirements for "temporary units," as set forth in 22 CCR 66264.553 apply.	Standard would become applicable to the management of the material if the material is determined to be hazardous pursuant to the regulation.
California Fish and Game Code	§1900 et. seq.	Relevant and Appropriate (1,2,3)/ Action	These statute sections sets forth programmatic and administrative provisions, and in §1908, provides that no person shall import into the state, or take, possess, or sell within this state, except as incident to the possession or sale of the real property on which the plant is growing, any native plant, or any part or product thereof, that the commission determines to be an endangered native plant or rare native plant	Although the definition of "person" in the statute does not apply to the Army, the standards of control are relevant and appropriate, and the citation is therefore considered an ARAR.
California Fish and Game Code	Title 14, CCR §783 et. seq.	Relevant and Appropriate (1,2,3)/ Action	These regulations provide that no person shall import into the State, export out of the State or take, possess, purchase, or sell within the State, any endangered species, threatened species, or part or product thereof, or attempt any of those acts, except as otherwise provided in the California Endangered Species Act, Fish and Game Code Section 2050, et seq. ("CESA"), the Native Plant Protection Act, the Natural Community Conservation Planning Act, the California Desert Native Plants Act, or as authorized under this article in an incidental take permit. The regulations also provide programmatic and administrative procedures for incidental take permits.	The Section includes specific standards of control with respect to taking rare or endangered plants. Although the definition of "person" in the statute does not apply to the Army, the standards of control are relevant and appropriate, and the citation is therefore considered an ARAR.

Source or Authority	Requirement, Standard, Or Criterion	Type	Description	Remarks
			State of California ARARs and TBCs (cont'd)	
California Clean Air Act (Health and Safety Code)	Title 17, CCR §80100 et. seq.	Relevant and Appropriate (1)/ Action	The regulations provide guidelines, programs and agency procedures for smoke management plans.	The regulations are considered relevant and appropriate. The Army will comply with substantive elements of the regulations. Under CERCLA, the Army is not required to comply with procedural and administrative provisions; however those elements will be addressed as part of the interim remedial design/remedial action process.
			Other State Regulations, Statutes, etc., considered and eliminated during the identification of ARARs and TBCs	
California Fish and Game Code	§711.7		This statute section designates the Department of Fish and Game as the trustee agency over California's fish and wildlife resources. It also concerns the payment of state filing an permit fees by persons engaging in projects or activities under federal licenses, contract or permit.	Not an ARAR. The statute section does not define a specific standard of control or a substantive requirement, criterion or limitation.
California Public Resources Code	§10005 and §21089		These code sections provide for requiring various filing fees.	Not an ARAR. The statute sections do not define a specific standard of control or a substantive requirement, criterion or limitation.

Source or Authority	Requirement, Standard, Or Criterion	Type	Description	Remarks
			Other State Regulations, Statutes, etc., considered and eliminated during the identification of ARARs and TBCs (cont'd)	
California Fish and Game Code	§5650 (a), (b) and (f)		These code sections provide: In §5650 (a), that it is unlawful to deposit in, permit to pass into, or place where it can pass into the waters of this state any of the following: (1) Any petroleum, acid, coal or oil tar, lampblack, aniline, asphalt, bitumen, or residuary product of petroleum, or carbonaceous material or substance. (2) Any refuse, liquid or solid, from any refinery, gas house, tannery, distillery, chemical works, mill, or factory of any kind. (3) Any sawdust, shavings, slabs, or edgings. (4) Any factory refuse, lime, or slag. (5) Any cocculus indicus. (6) Any substance or material deleterious to fish, plant life, or bird life. In §5650(b), that among other things, this section does not apply to a discharge or a release that is expressly authorized pursuant to, and in compliance with, the terms and conditions of a waste discharge requirement pursuant to Section 13263 of the Water Code or a waiver issued pursuant to subdivision (a) of Section 13269 of the Water Code issued by the State Water Resources Control Board or a regional water quality control board after a public hearing, or that is expressly authorized pursuant to, and in compliance with, the terms conditions of a federal permit for which the State Water Resources Control Board or a regional water quality control board has, after a public hearing, issued a water quality certification pursuant to Section 13160 of the Water Code. In §5650(f), that the affirmative defense in subdivision (c) does not apply and may not be raised by the defendant in any case in which a district attorney, city attorney, or Attorney General alleges, and the court finds, that the defendant acted willfully.	Not an ARAR. The scale and approach of the IA are such that waters of the State are not expected to be affected. Further, paragraph (6) does not define a specific standard of control or a substantive requirement, criterion or limitation. Not an ARAR. This section does not define a specific standard of control or a substantive requirement, criterion or limitation. Not an ARAR. This section does not define a specific standard of control or a substantive requirement, criterion or limitation.

Source or Authority	Requirement, Standard, Or Criterion	Type	Description	Remarks
			Other State Regulations, Statutes, etc., considered and eliminated during the identification of ARARs and TBCs (cont'd)	
California Fish and Game Code	§1600, 1601 and 1602		These code sections provide: In §1600, that the protection and conservation of the fish and wildlife resources of this state are declared to be of utmost public interest. Fish and wildlife are the property of the people and provide a major contribution to the economy of the state as well as providing a significant part of the people's food supply and therefore their conservation is a proper responsibility of the state. In §1601, that general plans sufficient to indicate the nature of a project for construction by, or on behalf of, any state or local governmental agency or any public utility shall be submitted to the department if the project will (1) divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake designated by the department in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit, (2) use material from the streambeds designated by the department, or (3) result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake designated by the department. The section provides also for consultation and approval procedures. In §1602, in addition to the provisions of Section 1601, the department, following submission of the modifications referred to in Section 1601, shall by mutual agreement with any state agency proposing such project, establish such procedures that the parties deem necessary to provide adequate review of the proposed modifications and consideration of alternative conditions designed to protect existing fish and wildlife resources. If no agreement can be reached between the department and the state agency proposing the project, the procedures for arbitration specified in Section 1601 shall then apply.	Not an ARAR. This section does not define a specific standard of control or a substantive requirement, criterion or limitation. Not an ARAR. This section does not define a specific standard of control or a substantive requirement, criterion or limitation. Further, this section does not apply to the Army, but rather to state or local agencies or public utilities. Not an ARAR. This section does not define a specific standard of control or a substantive requirement, criterion or limitation. Further, this section does not apply to the Army, but rather to state or local agencies or public utilities.

Source or Authority	Requirement, Standard, Or Criterion	Type	Description	Remarks
			Other State Regulations, Statutes, etc., considered and eliminated during the identification of ARARs and TBCs (cont'd)	
California Fish and Game Code	§1603		This statute section declares that it is unlawful for any person to substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the department, or use any material from the streambeds, without first notifying the department of that activity, except when the department has been notified pursuant to Section 1601. The section provides also for consultation and approval procedures.	Not an ARAR. The statute section does not define a specific standard of control or a substantive requirement, criterion or limitation.
California Fish and Game Code	§2014		This statute section declares that it is the policy of the State to conserve its natural resources. It allows the State to recover damages in a civil action against any person or local agency which unlawfully or negligently takes or destroys any bird, mammal, fish, reptile or amphibian protected by the laws of the State.	Not an ARAR. The statute section does not define a specific standard of control or a substantive requirement, criterion or limitation.
California Fish and Game Code	§2050-2068, 2070-2079		These statute sections provide declarations of policy, definitions and programmatic procedures.	Not an ARAR. The statute sections do not define a specific standard of control or a substantive requirement, criterion or limitation.
California Fish and Game Code	Title 14, CCR §670.2		This regulation lists the plants that are endangered, threatened or rare.	Not an ARAR. The rule does not define a specific standard of control or a substantive requirement, criterion or limitation.
California Fish and Game Code	Title 14, CCR §670.5		This regulation lists the animals that are endangered or threatened.	Not an ARAR. The rule does not define a specific standard of control or a substantive requirement, criterion or limitation.
Fish and Game Commission Wetlands Policy			The policy seeks to provide for the protection, preservation, restoration, enhancement and expansion of wetland habitat.	Not an ARAR or TBC. The scale and approach of the IA are such that wetlands are not expected to be affected.
California Fish and Game Code	§5050		This statute section declares that fully protected reptiles and amphibians or parts thereof may not be taken or possessed at any time. The following are fully protected reptiles and amphibians: (a) Blunt-nosed leopard lizard (Crotaphytus wislizenii silus) (b) San Francisco garter snake (Thamnophis sirtalis tetrataenia) (c) Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum) (d) Limestone salamander (Hydromantes brunus) (e) Black toad (Bufo boreas exsul)	Not an ARAR. The scale and approach of the IA are such that the listed species are not expected to be encountered.
California Fish and Game Code	§3800		This statute section prohibits the taking of nongame birds, except in accordance with the regulations of the commission.	Not an ARAR. Compliance with "the regulations of the commission" does not define a specific standard of control or a substantive requirement, criterion or limitation.
California Fish and Game Code	§4150		This statute section provides that nongame mammals may not be taken or possessed except as provided in the code or in accordance with regulations adopted by the commission.	Not an ARAR. Compliance with "the regulations of the commission" does not define a specific standard of control or a substantive requirement, criterion or limitation.

Table 5. Potential Applicable or Relevant and Appropriate Requirements (ARARS)
Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord, California

Source or Authority	Requirement, Standard, Or Criterion	Type	Description	Remarks
			Other State Regulations, Statutes, etc., considered and eliminated during the identification of ARARs and TBCs (cont'd)	
California Fish and Game Code	Title 14, CCR §475		This regulation provides that birds and nongame mammals may be taken in any manner except by poison or by recorded or amplified calls or sounds.	Not an ARAR. The scale and approach of the IA are such that the taking of the birds and nongame mammals covered by the regulation is not expected.
California Fish and Game Code	Title 14, CCR Chapter 4		This chapter provides for procedural regulations for implementing the California Environmental Quality Act.	Not an ARAR. The regulations set forth procedural and administrative provisions which do not qualify as ARARs.
California Fish and Game Code	§5515		This statutory section prohibits the take or possession of listed fully protected fish.	Not an ARAR. The scale and approach of the IA are such that the listed species are not expected to be encountered.
California Clean Air Act (Health and Safety Code)	Title 17, CCR §70200 and §70200.5		This rule establishes ambient standards for air quality.	Not an ARAR. As ambient standards, the extent of contribution, if any, of IA activities to meeting or exceeding the standards' concentrations versus the contributions of area or regional sources cannot be determined. 17 CCR 70101 states that the standards "provide a basis for preventing or abating the effects of air pollution." The standards themselves do not apply to individual sources.
California Clean Air Act (Health and Safety Code)	California Health and Safety Code §41700		This statute section prohibits discharge of air contaminants, which cause injury, detriment, nuisance or annoyance.	Not an ARAR. The statute section does not define a specific standard of control or a substantive requirement, criterion or limitation.
California Clean Air Act (Health and Safety Code)	California Health and Safety Code §41800		This statute section prohibits the use of open outdoor fires for the purpose of disposal or burning of various waste materials.	Not an ARAR. The intent of prescribed burning within the context of the IA is to remove vegetation and not to burn waste.
California Clean Air Act (Health and Safety Code)	California Health and Safety Code §41865		This statute section provides that no burning shall be conducted for the improvement of land for wildlife or game habitat until the person desiring to conduct such burning obtains from the Department of Fish and Game a written statement certifying that the burning is desirable and proper for the improvement of land for wildlife or game habitat and such statement is filed with the air pollution control officer having jurisdiction in the area in which the burning is to take place.	Not an ARAR. The approach of the IA is such that burning will not be conducted for the express purpose of improving land for wildlife or game habitat.
California Clean Air Act (Health and Safety Code)	AB 2595 & subsequent amendments (codified in Health and Safety Code)		This enabling legislation establishes programs and procedures for air toxics hotspot management.	Not an ARAR. The legislation does not define a specific standard of control or a substantive requirement, criterion or limitation.
California Clean Air Act (Health and Safety Code)	Monterey Bay Unified Air Pollution Control District Rule 402		This rule prohibits discharge of air contaminants, which cause injury, detriment, nuisance or annoyance.	Not an ARAR. The rule does not define a specific standard of control or a substantive requirement, criterion or limitation.

Source or Authority	Requirement, Standard, Or Criterion	Type	Description	Remarks
			Other State Regulations, Statutes, etc., considered and eliminated during the identification of ARARs and TBCs (cont'd)	
California Clean Air Act (Health and Safety Code)	Monterey Bay Unified Air Pollution Control District Rule 410		This rule is to establish requirements for range improvement burning. Applies to all persons who set or maintain fires used for range improvement burning.	Not an ARAR. The rule pertains to removal of vegetation for a wildlife, game or livestock habitat or for the initial establishment of an agricultural practice on previously uncultivated land, and does not pertain to IA measures.
California Integrated Waste Management Board Solid Waste Regulations Title 27, Division 2, Subdivision 1, Chapter 3, Subchapter 2, Article 2	27 CCR §20210		The regulation requires that designated wastes be discharged into Class I or Class II waste management units.	Not an ARAR. The scale and approach of the IA are such that designated wastes would not be generated.
California Integrated Waste Management Board Solid Waste Regulations Title 27, Division 2, Subdivision 1, Chapter 3, Subchapter 2, Article 2	27 CCR §20220		This regulation requires non-hazardous solid wastes (which are not defined as designated) to be discharged into a classified landfill (Class I, II or III).	Not an ARAR. The scale and approach of the IA are such that non-hazardous solid wastes would not need to be disposed.
OE Waste Identification	Draft DA Memorandum		Adopts criterion of 10% explosive content as a measure of contaminated soil reactivity to differentiate between hazardous waste or secondary explosives	Not an ARAR or TBC. Soil sampling/removal/treatment is not anticipated as part of potential remedial actions.
DOD Ammunition and Explosives Safety Standards, Safety Practices and Disposal	DOD 6055.9-STD		Requires specialized personnel for detection, clearance, and disposal of OE; stipulates required safety precautions and procedures.	Not an ARAR or TBC. This standard is not promulgated under environmental or facility siting laws.
California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65)	Health and Safety Code 25249.5 and §25249.6; and 22 CCR §§12000 et. seq.		These requirements prohibit the discharge of contaminants into groundwater or surface water. If such discharge is to occur a clear and reasonable warning must be given.	Not an ARAR. The scale and approach of the IA are such that waters of the State are not expected to be affected.
Porter-Cologne Water Quality Control Act	§13271 and §13304 of the California Water Code		These statute sections require the cleanup of the discharge of waste into groundwater and surface water.	Not an ARAR. The scale and approach of the IA are such that waters of the State are not expected to be affected.

Table 5. Potential Applicable or Relevant and Appropriate Requirements (ARARS)
Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord, California

Source or Authority	Requirement, Standard, Or Criterion	Type	Description	Remarks
			Other State Regulations, Statutes, etc., considered and eliminated during the identification of ARARs and TBCs (cont'd)	
Porter-Cologne Water Quality Control Act	§§13000, 13304, 13240, 12341, 13242, 13243 of the California Water Code		This statute establishes and describes policy for investigation and remediation of contaminated sites. Also includes implementation actions for setting groundwater and soil cleanup standard. Cleanup standards for water should be equal to backyard concentrations unless such levels are technically and economically infeasible to achieve. In such cases, cleanup standards should not exceed applicable water quality objectives.	Not an ARAR. The scale and approach of the IA are such that waters of the State are not expected to be affected.
Porter-Cologne Water Quality Control Act	§§13140, 13263 of the California Water Code; State Water Resources Control Board Resolution No. 68-16 ("Anti-degradation Policy".)		This statute requires that high quality surface and ground waters be maintained to the maximum extent possible. Degradation of waters will be allowed only if it is consistent with the maximum benefit to the people of the state, does not unreasonably affect present and anticipated beneficial uses, and does not result in water quality less than that prescribed in RWQCB and SWRCB policies. If degradation is allowed, the discharge must meet best practicable treatment or control, which must prevent pollution or nuisance and result in the highest water quality consistent with maximum benefit to the people of the state.	Not an ARAR. The scale and approach of the IA are such that waters of the State are not expected to be affected.
Porter-Cologne Water Quality Control Act	§§13260, 13267, 13307 of the California Water Code; State Water Resources Control Board Resolution No. 92-49 (As amended April 21, 1994.)		These requirements regulate the investigation, cleanup and abatement of discharges. Among other requirements, dischargers must clean up and abate effects of discharges in a manner that promotes the attainment of either background water quality, or the best water quality that is reasonable if background water quality cannot be restored. Requires the application of 23 CCR 2550.4, requirements for cleanups.	Not an ARAR. The scale and approach of the IA are such that waters of the State are not expected to be affected.
Porter-Cologne Water Quality Control Act	California Storm Water Permit for Industrial Activities, State Water Resources Control Board Order#97-03-DWQ		This requirement regulates pollutants in discharge of storm water associated with hazardous waste treatment, land application sites. Requirements to ensure storm water discharges do no contribute to violation of surface water quality standards.	Not an ARAR. The scale and approach of the IA are such that waters of the State are not expected to be affected.
Children's Environmental Health Protection Act	SB25 (1999)		This law requires the state to: review ambient standards for adequacy, identify up to 5 toxic air contaminants that may cause infants and children to be ill, revise control measures to reduce exposure, and adhere to other procedural provisions.	Not an ARAR. This legislation does not define a specific standard of control or a substantive requirement, criterion or limitation.

1= Site Preparation & Clearance; 2=OE Remedial Action; 3=Detonation of OE

Table 6. Summary and Comparison of Interim Action Alternatives Evaluation – Ranges 43-48
Interim Action OE Remedial Investigation/Feasibility Study
Former Fort Ord, California

Evaluation Criteria	Interim Action Alternatives									
	Vegetation Clearance Alternatives				OE Remedial Action Alternatives			OE Detonation Alternatives		
	No Action	Prescribed Burning	Mechanical Methods	Manual Methods	No Action with Existing Site Security Measures	Enhanced Site Security Measures	Subsurface OE Removal	No Action	Detonation w/Engr Controls	Detonation Chamber & Detonation w/Engr Controls
Effectiveness *(Includes Overall Protection of Human Health and the Environment, Compliance with ARARs, Short-Term Effectiveness, Long-Term Effectiveness and Permanence, Reduction of Toxicity, Mobility or Volume Through Treatment)*	Not effective in short or long term because it takes no action to address the need for vegetation clearance if Subsurface Removal of OE is selected as the OE Remedial Action alternative. Effective if No Action w/ Existing Site Security or Enhanced Site Security is selected as OE Remedial Action alternative because vegetation clearance would not be required. Reduction of toxicity, mobility or volume criteria is not applicable to vegetation clearance.	Very effective in short term at clearing vegetation quickly over large areas; effective as a long term because it has beneficial effects on the regrowth and long term health of CMC vegetation. Would comply with ARARs and be protective of human health and the environment (with mitigation measures such as smoke management and relocation of affected residents during burning). Reduction of toxicity, mobility or volume criteria is not applicable to vegetation clearance.	Effective in short term at clearing vegetation; however, could only be used in limited areas of 50 acres in size due to HMP requirements, and would not clear vegetation as thoroughly as burning. Not effective in the long term because it would have detrimental effects on the regrowth and long term health of CMC vegetation. Would not comply with ARARs if used for more than 50 acres of IA site, would not be protective of human health in terms of worker direct exposure to OE while clearing, and would not be protective of the environment. Reduction of toxicity, mobility or volume criteria is not applicable to vegetation clearance.	Effective in short term at clearing vegetation; however, could only be used in limited areas of 50 acres in size due to HMP requirements, and would not clear vegetation as thoroughly as burning. Not effective in the long term because it would have detrimental effects on the regrowth and long term health of CMC vegetation. Would not comply with ARARs if used for more than 50 acres of IA site, would not be protective of human health in terms of worker direct exposure to OE while clearing, and would not be protective of the environment. Reduction of toxicity, mobility or volume criteria is not applicable to vegetation clearance.	Not effective in short term or long term at reducing OE hazards because it takes no action beyond maintaining existing site security measures such as fencing, warning signs, and security patrols which have been breached by trespassers in the past. Would not be protective of human health or the environment if no action is taken to mitigate OE hazards. Would not reduce toxicity, mobility or volume of OE.	Not effective in short term or long term at reducing OE hazards because it takes no action beyond enhancing existing site security measures such as fencing, warning signs, and security patrols which could still be breached by trespassers. Would not be as protective of human health or the environment since it does not reduce toxicity, mobility or volume of OE.	Very effective in short term and long term at reducing OE hazards because it removes all OE to depths consistent with planned reuse of IA site. Would comply with ARARs and be protective of human health and the environment by removing OE hazards. Would reduce mobility and volume of OE.	Not effective in short term or long term because it takes no action to address OE hazards. Would not be protective of human health or the environment. Would not reduce toxicity, mobility or volume of OE.	Very effective in short term and long term for 100% of OE items in reducing OE-related hazards through detonation. Would comply with ARARs and be protective of human health and the environment. Would reduce hazards associated with OE.	<u>Detonation Chamber</u> Effective for 5% of OE items that can be safely transported to temporary chamber location. Requires additional handling of OE to place in chamber. Would comply with ARARs and be protective of human health and the environment. Effective in short and long term and would reduce hazards associated with OE. <u>Engineering Controls</u> Very effective for 100% of OE items as previously described.

Table 6. Summary and Comparison of Interim Action Alternatives Evaluation – Ranges 43-48
Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord, California

Evaluation Criteria	Interim Action Alternatives									
	Vegetation Clearance Alternatives				OE Remedial Action Alternatives			OE Detonation Alternatives		
	No Action	Prescribed Burning	Mechanical Methods	Manual Methods	No Action with Existing Site Security Measures	Enhanced Site Security Measures	Subsurface OE Removal	No Action	Detonation with Engineering Controls	Detonation Chamber and Detonation with Engineering Controls
Implementability *(Includes State & Community Acceptance)*	Easy to implement because it takes no action to clear vegetation. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Easy to implement to clear vegetation quickly ; would take approximately 1 month to coordinate burn and clear vegetation. Equipment and personnel readily available. Must be conducted in close coordination with agencies and public to address concerns about smoke and fire danger. Would require prior public notification, smoke management while conducting the burn, and temporary relocation of individuals from areas affected by smoke to unaffected areas to minimize impacts of smoke and emissions. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Difficult to implement to clear vegetation quickly; would take several months to clear vegetation over entire IA site and would require close coordination with OE remedial workers. Equipment and personnel readily available. However, cannot be used to clear vegetation over entire IA site due to HMP requirements that limit its use to 50 acres or less over the 483 acres of CMC habitat found at the IA site. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Difficult to implement to clear vegetation quickly; would take several months to clear vegetation over entire IA site and would require close coordination with OE remedial workers. Equipment and personnel readily available. However, cannot be used to clear vegetation over entire IA site due to HMP requirements that limit its use to 50 acres or less over the 483 acres of CMC habitat found at the IA site. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Easy to implement because it takes no additional action beyond maintaining existing site security measures such as fencing, warning signs, and security patrols for an interim period of 5 years while final long term O&M measures are decided in the basewide OE RI/FS. Equipment and personnel are readily available. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Moderately easy to implement because it takes no additional action beyond enhancing existing site security measures such as fencing, warning signs, and security patrols and maintaining new measures for an interim period of 5 years while final long term O&M measures are decided in the basewide OE RI/FS. Equipment and personnel are readily available. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Difficult to implement over large areas, but equipment and personnel are readily available. Performed for many years at Fort Ord. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Easy to implement because it takes no action to detonate UXO found during OE Remedial Action. Difficult to implement from an administrative perspective because detonation of UXO would be required to eliminate OE hazards once found. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Easy to implement; performed during OE removal activities at Fort Ord for many years. Equipment and personnel readily available. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	<u>Detonation Chamber</u> Difficult to implement because it requires additional handling of OE to place in chamber and chambers cannot be moved over 483 acres of IA site. A chamber could be temporarily located at each of five access gates to the IA site, but OE would still have to carried over hundreds of acres and stockpiled at the temporary locations to be detonated in the chamber, increasing the potential for accidental detonation. Based on site-specific surface OE removal data, 5% of OE items would be eligible for detonation in the chamber. State and Community Acceptance would be addressed after the IA RI/FS Proposed Plan in the ROD. <u>Engineering Controls</u> Can be used for 100% of OE items and implementable as previously described.
Cost	No Cost	Capital: $1.7 million O&M: $213,000 (5 years) TOTAL: $1.9 million	Capital: $1.4 million O&M: $213,000 (5 years) TOTAL: $1.6 million	Capital: $2.5 million O&M: $213,000 (5 years) TOTAL: $2.8 million	Capital: None O&M: $235,000 (5 years) TOTAL: $235,000	Capital: $1.1 million O&M: $3.3 million (5 years) TOTAL: $4.5 million	Capital: *$10.6 - 11.2 million O&M: None TOTAL: *$10.6 - 11.2 million	No Cost	Capital: $1.1 million O&M: None TOTAL: $1.1 million	Capital: $1.1 million O&M: None TOTAL: $1.1 million

* Range of Costs for Subsurface OE Removal based on estimated costs for 1 ft. to 4 ft. depth of removal.
ARAR Applicable or relevant and appropriate requirements.
HMP Habitat Management Plan.
OE Ordnance and Explosives.
O&M Operations and Maintenance.
UXO Unexploded Ordnance.

Table 7. Summary and Comparison of Interim Action Alternatives Evaluation – Range 30A
Interim Action OE Remedial Investigation/Feasibility Study
Former Fort Ord, California

Evaluation Criteria	Interim Action Alternatives									
	Vegetation Clearance Alternatives				OE Remedial Action Alternatives			OE Detonation Alternatives		
	No Action	Prescribed Burning	Mechanical Methods	Manual Methods	No Action with Existing Site Security Measures	Enhanced Site Security Measures	Subsurface OE Removal	No Action	Detonation w/Engr Controls	Detonation Chamber & Detonation w/Engr Controls
Effectiveness *(Includes Overall Protection of Human Health and the Environment, Compliance with ARARs, Short-Term Effectiveness, Long-Term Effectiveness and Permanence, Reduction of Toxicity, Mobility or Volume Through Treatment)*	Not effective in short or long term because it takes no action to address the need for vegetation clearance if Subsurface Removal of OE is selected as the OE Remedial Action alternative. Effective if No Action w/ Existing Site Security or Enhanced Site Security is selected as OE Remedial Action alternative because vegetation clearance would not be required. Reduction of toxicity, mobility or volume criteria is not applicable to vegetation clearance.	Very effective in short term at clearing vegetation quickly over large areas; effective as a long term because it has beneficial effects on the regrowth and long term health of CMC vegetation. Would comply with ARARs and be protective of human health and the environment (with mitigation measures such as smoke management and relocation of affected residents during burning). Reduction of toxicity, mobility or volume criteria is not applicable to vegetation clearance.	Effective in short term at clearing vegetation; however, could only be used in limited areas of 50 acres in size due to HMP requirements, and would not clear vegetation as thoroughly as burning. Not effective in the long term because it would have detrimental effects on the regrowth and long term health of CMC vegetation. Would not comply with ARARs if used for more than 50 acres of IA site, would not be protective of human health in terms of worker direct exposure to OE while clearing, and would not be protective of the environment. Reduction of toxicity, mobility or volume criteria is not applicable to vegetation clearance.	Effective in short term at clearing vegetation; however, could only be used in limited areas of 50 acres in size due to HMP requirements, and would not clear vegetation as thoroughly as burning. Not effective in the long term because it would have detrimental effects on the regrowth and long term health of CMC vegetation. Would not comply with ARARs if used for more than 50 acres of IA site, would not be protective of human health in terms of worker direct exposure to OE while clearing, and would not be protective of the environment. Reduction of toxicity, mobility or volume criteria is not applicable to vegetation clearance.	Not effective in short term or long term at reducing OE hazards because it takes no action beyond maintaining existing site security measures such as fencing, warning signs, and security patrols which have been breached by trespassers in the past. Would not be protective of human health or the environment if no action is taken to mitigate OE hazards. Would not reduce toxicity, mobility or volume of OE.	Not effective in short term or long term at reducing OE hazards because it takes no action beyond enhancing existing site security measures such as fencing, warning signs, and security patrols which could still be breached by trespassers. Would not be as protective of human health or the environment since it does not reduce toxicity, mobility or volume of OE.	Very effective in short term and long term at reducing OE hazards because it removes all OE to depths consistent with planned reuse of IA site. Would comply with ARARs and be protective of human health and the environment by removing OE hazards. Would reduce mobility and volume of OE.	Not effective in short term or long term because it takes no action to address OE hazards. Would not be protective of human health or the environment. Would not reduce toxicity, mobility or volume of OE.	Very effective in short term and long term for 100% of OE items in reducing OE-related hazards through detonation. Would comply with ARARs and be protective of human health and the environment. Would reduce hazards associated with OE.	<u>Detonation Chamber</u> Effective for 10% of OE items that can be safely transported to temporary chamber location. Requires additional handling of OE to place in chamber. Would comply with ARARs and be protective of human health and the environment. Effective in short and long term and would reduce hazards associated with OE. <u>Engineering Controls</u> Very effective for 100% of OE items as previously described.

Table 7. Summary and Comparison of Interim Action Alternatives Evaluation – Range 30A
Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord, California

Evaluation Criteria	Interim Action Alternatives									
	Vegetation Clearance Alternatives				OE Remedial Action Alternatives			OE Detonation Alternatives		
	No Action	Prescribed Burning	Mechanical Methods	Manual Methods	No Action with Existing Site Security Measures	Enhanced Site Security Measures	Subsurface OE Removal	No Action	Detonation with Engineering Controls	Detonation Chamber and Detonation with Engineering Controls
Implementability *(Includes State & Community Acceptance)*	Easy to implement because it takes no action to clear vegetation. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Easy to implement to clear vegetation quickly; would take approximately 1 month to coordinate burn and clear vegetation. Equipment and personnel readily available. Must be conducted in close coordination with agencies and public to address concerns about smoke and fire danger. Would require prior public notification, smoke management while conducting the burn, and temporary relocation of individuals from areas affected by smoke to unaffected areas to minimize impacts of smoke and emissions. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Difficult to implement to clear vegetation quickly; would take several months to clear vegetation over entire IA site and would require close coordination with OE remedial workers. Equipment and personnel readily available. However, cannot be used to clear vegetation over entire IA site due to HMP requirements that limit its use to 50 acres or less over the 388 acres of CMC habitat found at the IA site. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Difficult to implement to clear vegetation quickly; would take several months to clear vegetation over entire IA site and would require close coordination with OE remedial workers. Equipment and personnel readily available. However, cannot be used to clear vegetation over entire IA site due to HMP requirements that limit its use to 50 acres or less over the 388 acres of CMC habitat found at the IA site. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Easy to implement because it takes no additional action beyond maintaining existing site security measures such as fencing, warning signs, and security patrols for an interim period of 5 years while final long term O&M measures are decided in the basewide OE RI/FS. Equipment and personnel are readily available. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Moderately easy to implement because it takes no additional action beyond enhancing existing site security measures such as fencing, warning signs, and security patrols and maintaining new measures for an interim period of 5 years while final long term O&M measures are decided in the basewide OE RI/FS. Equipment and personnel are readily available. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Difficult to implement over large areas, but equipment and personnel are readily available. Performed for many years at Fort Ord. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Easy to implement because it takes no action to detonate UXO found during OE Remedial Action. Difficult to implement from an administrative perspective because detonation of UXO would be required to eliminate OE hazards once found. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Easy to implement; performed during OE removal activities at Fort Ord for many years. Equipment and personnel readily available. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	<u>Detonation Chamber</u> Difficult to implement because it requires additional handling of OE to place in chamber and chambers cannot be moved over the 388 acres IA site. A chamber could be temporarily located at each of five access gates to the IA site, but OE would still have to carried over hundreds of acres and stockpiled at the temporary locations to be detonated in the chamber, increasing the potential for accidental detonation. Based on site-specific surface OE removal data, 10% of OE items would be eligible for detonation in the chamber. State and Community Acceptance would be addressed after the IA RI/FS Proposed Plan in the ROD. <u>Engineering Controls</u> Can be used for 100% of OE items and implementable as previously described.
Cost	No Cost	Capital: $1.4 million O&M: $149,000 (5 years) TOTAL: $1.5 million	Capital: $1.8 million O&M: $149,000 (5 years) TOTAL: $1.9 million	Capital: $2.0 million O&M: $149,000 (5 years) TOTAL: $2.1 million	Capital: None O&M: $164,000 (5 years) TOTAL: $164,000	Capital: $1.0 O&M: $3.2 million (5 years) TOTAL: $4.2 million	Capital: *$.6.8 to $7.7 million O&M: None TOTAL: *$6.8 to $7.7 million	No Cost	Capital: $124,000 O&M: None TOTAL: $124,000	Capital: $136,000 O&M: None TOTAL: $136,000

* Range of Costs for Subsurface OE Removal based on estimated costs for 1 ft. to 4 ft. depth of removal.
ARAR Applicable or relevant and appropriate requirements.
HMP Habitat Management Plan.
OE Ordnance and Explosives.
O&M Operations and Maintenance.
UXO Unexploded Ordnance.

Table 8. Summary and Comparison of Interim Action Alternatives Evaluation – Site OE-16
Interim Action OE Remedial Investigation/Feasibility Study
Former Fort Ord, California

Evaluation Criteria	Interim Action Alternatives									
	Vegetation Clearance Alternatives				OE Remedial Action Alternatives			OE Detonation Alternatives		
	No Action	Prescribed Burning	Mechanical Methods	Manual Methods	No Action with Existing Site Security Measures	Enhanced Site Security Measures	Subsurface OE Removal	No Action	Detonation w/Engr Controls	Detonation Chamber & Detonation w/Engr Controls
Effectiveness *(Includes Overall Protection of Human Health and the Environment, Compliance with ARARs, Short-Term Effectiveness, Long-Term Effectiveness and Permanence, Reduction of Toxicity, Mobility or Volume Through Treatment)*	Not effective in short or long term because it takes no action to address the need for vegetation clearance if Subsurface Removal of OE is selected as the OE Remedial Action alternative. Effective if No Action w/ Existing Site Security or Enhanced Site Security is selected as OE Remedial Action alternative because vegetation clearance would not be required. Reduction of toxicity, mobility or volume criteria is not applicable to vegetation clearance.	Very effective in short term at clearing vegetation quickly over large areas; effective as a long term because it has beneficial effects on the regrowth and long term health of CMC vegetation. Would comply with ARARs and be protective of human health and the environment (with mitigation measures such as smoke management and relocation of affected residents during burning). Reduction of toxicity, mobility or volume criteria is not applicable to vegetation clearance.	Effective in short term at clearing vegetation; however, could only be used in limited areas of 50 acres in size due to HMP requirements, and would not clear vegetation as thoroughly as burning. Not effective in the long term because it would have detrimental effects on the regrowth and long term health of CMC vegetation. Would not comply with ARARs if used for more than 50 acres of IA site, would not be protective of human health in terms of worker direct exposure to OE while clearing, and would not be protective of the environment. Reduction of toxicity, mobility or volume criteria is not applicable to vegetation clearance.	Effective in short term at clearing vegetation; however, could only be used in limited areas of 50 acres in size due to HMP requirements, and would not clear vegetation as thoroughly as burning. Not effective in the long term because it would have detrimental effects on the regrowth and long term health of CMC vegetation. Would not comply with ARARs if used for more than 50 acres of IA site, would not be protective of human health in terms of worker direct exposure to OE while clearing, and would not be protective of the environment. Reduction of toxicity, mobility or volume criteria is not applicable to vegetation clearance.	Not effective in short term or long term at reducing OE hazards because it takes no action beyond maintaining existing site security measures such as fencing, warning signs, and security patrols which have been breached by trespassers in the past. Would not be protective of human health or the environment if no action is taken to mitigate OE hazards. Would not reduce toxicity, mobility or volume of OE.	Not effective in short term or long term at reducing OE hazards because it takes no action beyond enhancing existing site security measures such as fencing, warning signs, and security patrols which could still be breached by trespassers. Would not be as protective of human health or the environment since it does not reduce toxicity, mobility or volume of OE.	Very effective in short term and long term at reducing OE hazards because it removes all OE to depths consistent with planned reuse of IA site. Would comply with ARARs and be protective of human health and the environment by removing OE hazards. Would reduce mobility and volume of OE.	Not effective in short term or long term because it takes no action to address OE hazards. Would not be protective of human health or the environment. Would not reduce toxicity, mobility or volume of OE.	Very effective in short term and long term for 100% of OE items in reducing OE-related hazards through detonation. Would comply with ARARs and be protective of human health and the environment. Would reduce hazards associated with OE.	<u>Detonation Chamber</u> Effective for 10% of OE items that can be safely transported to temporary chamber location. Requires additional handling of OE to place in chamber. Would comply with ARARs and be protective of human health and the environment. Effective in short and long term and would reduce hazards associated with OE. <u>Engineering Controls</u> Very effective for 100% of OE items as previously described.

Table 8. Summary and Comparison of Interim Action Alternatives Evaluation – Site OE-16
Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord, California

Evaluation Criteria	Interim Action Alternatives									
	Vegetation Clearance Alternatives				OE Remedial Action Alternatives			OE Detonation Alternatives		
	No Action	Prescribed Burning	Mechanical Methods	Manual Methods	No Action with Existing Site Security Measures	Enhanced Site Security Measures	Subsurface OE Removal	No Action	Detonation with Engineering Controls	Detonation Chamber and Detonation with Engineering Controls
Implementability *(Includes State & Community Acceptance)*	Easy to implement because it takes no action to clear vegetation. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Easy to implement to clear vegetation quickly; would take approximately 1 month to coordinate burn and clear vegetation. Equipment and personnel readily available. Must be conducted in close coordination with agencies and public to address concerns about smoke and fire danger. Would require prior public notification, smoke management while conducting the burn, and temporary relocation of individuals from areas affected by smoke to unaffected areas to minimize impacts of smoke and emissions. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Difficult to implement to clear vegetation quickly; would take several months to clear vegetation over entire IA site and would require close coordination with OE remedial workers. Equipment and personnel readily available. However, cannot be used to clear vegetation over entire IA site due to HMP requirements that limit its use to 50 acres or less over the 80 acres of CMC habitat found at the IA site. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Difficult to implement to clear vegetation quickly; would take several months to clear vegetation over entire IA site and would require close coordination with OE remedial workers. Equipment and personnel readily available. However, cannot be used to clear vegetation over entire IA site due to HMP requirements that limit its use to 50 acres or less over the 80 acres of CMC habitat found at the IA site. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Easy to implement because it takes no additional action beyond maintaining existing site security measures such as fencing, warning signs, and security patrols for an interim period of 5 years while final long term O&M measures are decided in the basewide OE RI/FS. Equipment and personnel are readily available. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Moderately easy to implement because it takes no additional action beyond enhancing existing site security measures such as fencing, warning signs, and security patrols and maintaining new measures for an interim period of 5 years while final long term O&M measures are decided in the basewide OE RI/FS. Equipment and personnel are readily available. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Difficult to implement over large areas, but equipment and personnel are readily available. Performed for many years at Fort Ord. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Easy to implement because it takes no action to detonate UXO found during OE Remedial Action. Difficult to implement from an administrative perspective because detonation of UXO would be required to eliminate OE hazards once found. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Easy to implement; performed during OE removal activities at Fort Ord for many years. Equipment and personnel readily available. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	<u>Detonation Chamber</u> Difficult to implement because it requires additional handling of OE to place in chamber and chambers cannot be moved over 80 acres of IA site. A chamber could be temporarily located at each of five access gates to the IA site, but OE would still have to carried over many acres and stockpiled at the temporary locations to be detonated in the chamber, increasing the potential for accidental detonation. Based on site-specific surface OE removal data, 10% of OE items would be eligible for detonation in the chamber. State and Community Acceptance would be addressed after the IA RI/FS Proposed Plan in the ROD. <u>Engineering Controls</u> Can be used for 100% of OE items and implementable as previously described.
Cost	No Cost	Capital: $288,000 O&M: $30,000 (5 years) TOTAL: $318,000	Capital: $228,000 O&M: $30,000 (5 years) TOTAL: $258,000	Capital: $411,000 O&M: $30,000 (5 years) TOTAL: $441,000	Capital: None O&M: $35,000 (5 years) TOTAL: $35,000	Capital: $412,000 O&M: $1.4 million (5 years) TOTAL: $1.8 million	Capital: *$1.29 - $1.3 million O&M: None TOTAL: *$1.29 - $1.3 million	No Cost	Capital: $13,000 O&M: None TOTAL: $13,000	Capital: $28,000 O&M: None TOTAL: $28,000

* Range of Costs for Subsurface OE Removal based on estimated costs for 1 ft. to 4 ft. depth of removal.
ARAR Applicable or relevant and appropriate requirements.
HMP Habitat Management Plan.
OE Ordnance and Explosives.
O&M Operatio ns and Maintenance.
UXO Unexploded Ordnance.

Table 9. Summary of the Preliminarily Identified Preferred Interim Action Alternatives Evaluation – Ranges 43-48
Interim Action OE Remedial Investigation/Feasibility Study, Former Fort Ord, California

Evaluation Criteria	Preliminarily Identified Preferred Interim Action Alternatives		
	Vegetation Clearance Alternative	**OE Remedial Action Alternative**	**OE Detonation Alternative**
	Prescribed Burning	**Subsurface OE Removal**	**Detonation w/Engr Controls**
Effectiveness *(Includes Overall Protection of Human Health and the Environment, Compliance with ARARs, Short-Term Effectiveness, Long-Term Effectiveness and Permanence, Reduction of Toxicity, Mobility and Volume Through Treatment)*	Very effective in short term at clearing vegetation quickly over large areas; effective as a long term because it has beneficial effects on the regrowth and long term health of CMC vegetation. Would comply with ARARs and be protective of human health and the environment (with mitigation measures such as smoke management and relocation of affected residents during burning). Reduction of toxicity, mobility or volume criteria is not applicable to vegetation clearance.	Very effective in short term and long term at reducing OE hazards because it removes all OE to depths consistent with planned reuse of IA site. Would comply with ARARs and be protective of human health and the environment by removing OE hazards. Would reduce mobility and volume of OE.	Very effective in short term and long term for 100% of OE items in reducing OE-related hazards through detonation. Would comply with ARARs and be protective of human health and the environment. Would reduce hazards associated with OE.
Implementability *(Includes State and Community Acceptance, which will be evaluated in the IA RI/FS Proposed Plan and ROD)*	Easy to implement to clear vegetation quickly; would take approximately 1 month to coordinate burn and clear vegetation. Equipment and personnel readily available. Must be conducted in close coordination with agencies and public to address concerns about smoke and fire danger. Would require prior public notification, smoke management while conducting the burn, and temporary relocation of individuals from areas affected by smoke to unaffected areas to minimize impacts of smoke and emissions. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Difficult to implement over large areas, but equipment and personnel are readily available. Performed for many years at Fort Ord. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Easy to implement; performed during OE removal activities at Fort Ord for many years. Equipment and personnel readily available. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.
Cost	Capital: $1.7 million O&M: 213,000 $ (5 years) TOTAL COST: $1.9 million	Capital: *$10.6 to $11.2 million O&M: None TOTAL COST: $10.6 to $11.2 million	Capital: $1.1 million O&M: None TOTAL COST: $1.1 million
Total Preliminarily Identified Preferred Alternative Cost	Capital: *$13.4 to $14.0 million O&M: $213,000 TOTAL: *$13.6 - $14.2 million		

* Range of Costs for Subsurface OE Removal based on estimated costs for 1 ft. to 4 ft. depth of removal.

ARAR Applicable or relevant and appropriate requirements.
HMP Habitat Management Plan.
OE Ordnance and Explosives.
O&M Operations and Maintenance.
UXO Unexploded Ordnance.

Table 10. Summary of the Preliminarily Identified Preferred Interim Action Alternatives Evaluation – Range 30A
Interim Action OE Remedial Investigation/Feasibility Study, Former Fort Ord, California

Evaluation Criteria	Preliminarily Identified Preferred Interim Action Alternatives		
	Vegetation Clearance Alternative	**OE Remedial Action Alternative**	**OE Detonation Alternative**
	Prescribed Burning	**Subsurface OE Removal**	**Detonation w/Engr Controls**
Effectiveness *(Includes Overall Protection of Human Health and the Environment, Compliance with ARARs, Short-Term Effectiveness, Long-Term Effectiveness and Permanence, Reduction of Toxicity, Mobility and Volume Through Treatment)*	Very effective in short term at clearing vegetation quickly over large areas; effective as a long term because it has beneficial effects on the regrowth and long term health of CMC vegetation. Would comply with ARARs and be protective of human health and the environment (with mitigation measures such as smoke management and relocation of affected residents during burning). Reduction of toxicity, mobility or volume criteria is not applicable to vegetation clearance.	Very effective in short term and long term at reducing OE hazards because it removes all OE to depths consistent with planned reuse of IA site. Would comply with ARARs and be protective of human health and the environment by removing OE hazards. Would reduce mobility and volume of OE.	Very effective in short term and long term for 100% of OE items in reducing OE-related hazards through detonation. Would comply with ARARs and be protective of human health and the environment. Would reduce hazards associated with OE.
Implementability *(Includes State and Community Acceptance, which will be evaluated in the IA RI/FS Proposed Plan and ROD)*	Easy to implement to clear vegetation quickly; would take approximately 1 month to coordinate burn and clear vegetation. Equipment and personnel readily available. Must be conducted in close coordination with agencies and public to address concerns about smoke and fire danger. Would require prior public notification, smoke management while conducting the burn, and temporary relocation of individuals from areas affected by smoke to unaffected areas to minimize impacts of smoke and emissions. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Difficult to implement over large areas, but equipment and personnel are readily available. Performed for many years at Fort Ord. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Easy to implement; performed during OE removal activities at Fort Ord for many years. Equipment and personnel readily available. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received
Cost	Capital: $1.4 million O&M: 149,000 $ (5 years) TOTAL COST: $1.5 million	Capital: *$6.8 to $7.7 million O&M: None TOTAL COST: $6.7 to $7.7 million	Capital: $124,000 O&M: None TOTAL COST: $124,000
Total Preliminarily Identified Preferred Alternative Cost	Capital: *$8.2 to $9.2 million O&M: $149,000 TOTAL: *$8.3 to $9.3 million		

* Range of Costs for Subsurface OE Removal based on estimated costs for 1 ft. to 4 ft. depth of removal.

ARAR Applicable or relevant and appropriate requirements.
HMP Habitat Management Plan.
OE Ordnance and Explosives.
O&M Operations and Maintenance.
UXO Unexploded Ordnance.

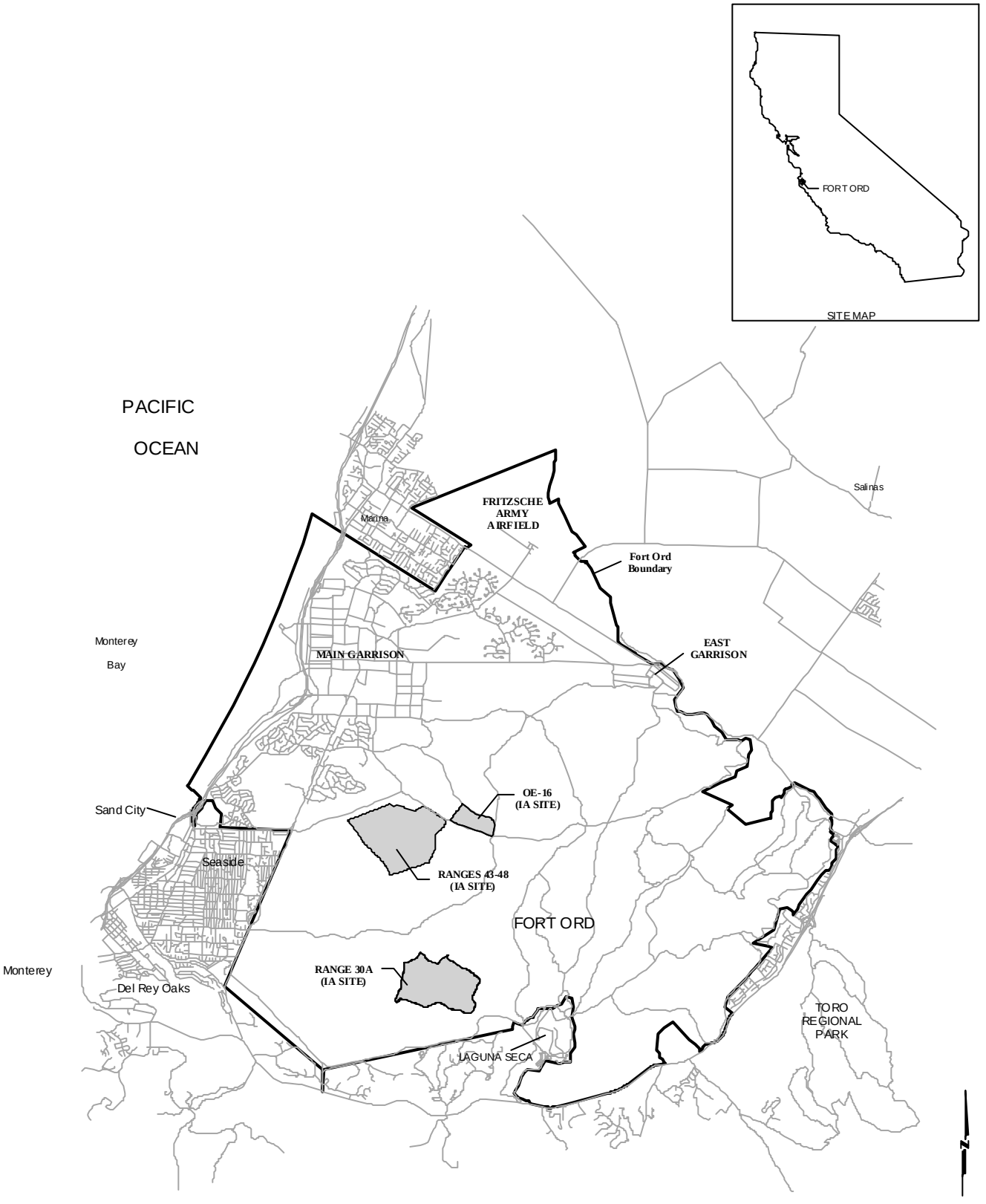
Table 11. Summary of the Preliminarily Identified Preferred Interim Action Alternatives Evaluation – Site OE-16
Interim Action OE Remedial Investigation/Feasibility Study, Former Fort Ord, California

Evaluation Criteria	Preliminarily Identified Preferred Interim Action Alternatives		
	Vegetation Clearance Alternative	**OE Remedial Action Alternative**	**OE Detonation Alternative**
	Prescribed Burning	**Subsurface OE Removal**	**Detonation w/Engr Controls**
Effectiveness *(Includes Overall Protection of Human Health and the Environment, Compliance with ARARs, Short-Term Effectiveness, Long-Term Effectiveness and Permanence, Reduction of Toxicity, Mobility and Volume Through Treatment)*	Very effective in short term at clearing vegetation quickly over large areas; effective as a long term because it has beneficial effects on the regrowth and long term health of CMC vegetation. Would comply with ARARs and be protective of human health and the environment (with mitigation measures such as smoke management and relocation of affected residents during burning). Reduction of toxicity, mobility or volume criteria is not applicable to vegetation clearance.	Very effective in short term and long term at reducing OE hazards because it removes all OE to depths consistent with planned reuse of IA site. Would comply with ARARs and be protective of human health and the environment by removing OE hazards. Would reduce mobility and volume of OE.	Very effective in short term and long term for 100% of OE items in reducing OE-related hazards through detonation. Would comply with ARARs and be protective of human health and the environment. Would reduce hazards associated with OE.
Implementability *(Includes State and Community Acceptance, which will be evaluated in the IA RI/FS Proposed Plan and ROD)*	Easy to implement to clear vegetation quickly; would take approximately 1 month to coordinate burn and clear vegetation. Equipment and personnel readily available. Must be conducted in close coordination with agencies and public to address concerns about smoke and fire danger. Would require prior public notification, smoke management while conducting the burn, and temporary relocation of individuals from areas affected by smoke to unaffected areas to minimize impacts of smoke and emissions. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Difficult to implement over large areas, but equipment and personnel are readily available. Performed for many years at Fort Ord. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received.	Easy to implement; performed during OE removal activities at Fort Ord for many years. Equipment and personnel readily available. State and Community Acceptance will be addressed in the IA RI/FS ROD once comments on the IA RI/FS report and Proposed Plan have been received
Cost	Capital: $288,000 O&M: 30,000 $ (5 years) TOTAL COST: $318,000	Capital: *$1.29 to $1.3 million O&M: None TOTAL COST: $1.29 to $1.3 million	Capital: $13,000 O&M: None TOTAL COST: $13,000
Total Preliminarily Identified Preferred Alternative Cost	Capital: *$1.59 to $1.6 million O&M: $30,000 TOTAL: *$1.62 to $1.63 million		

* Range of Costs for Subsurface OE Removal based on estimated costs for 1 ft. to 4 ft. depth of removal.

ARAR Applicable or relevant and appropriate requirements.
HMP Habitat Management Plan.
OE Ordnance and Explosives.
O&M Operations and Maintenance.
UXO Unexploded Ordnance.

PLATES

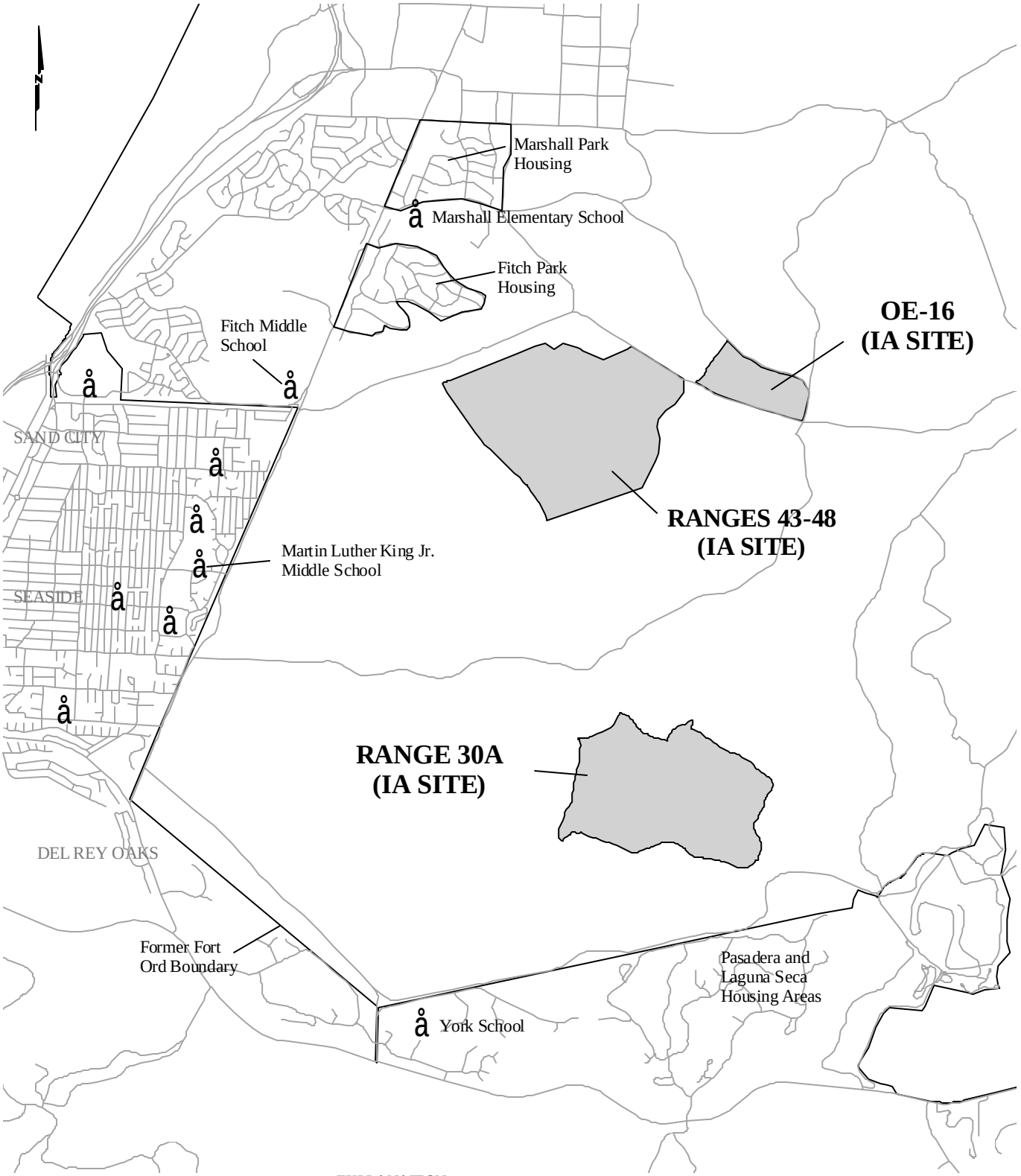


Site Location
Interim Action Ordnance and Explosives
Remedial Investigation/Feasibility Study
Former Fort Ord
Monterey County, California

PLATE
1

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
JCB	46310 001715		10/01	1/02

ia_rifs.sgr - SiteLocation Plate 1 Layout - 10/15/01



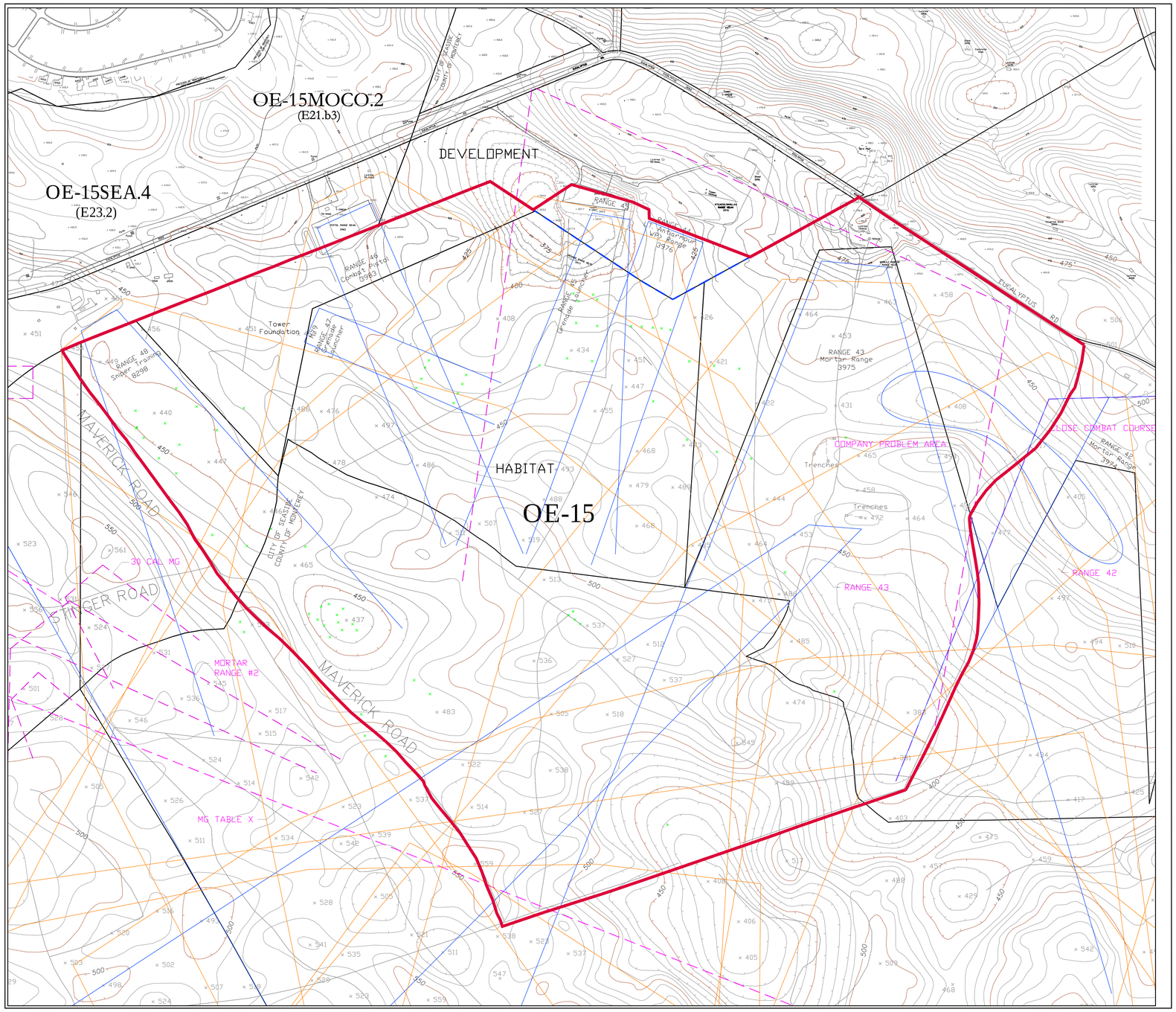
Site Location Relative to Neighboring Communities

Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord, Monterey County, California

PLATE 2

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
JCB	46310 001715		10/01	1/02

ia_rifs.apr - SiteLocation Plate 2 Layout - 10/15/01



0 300 600
SCALE IN FEET

Removal Area Boundary

[For illustrative purpose only. Actual limits of removal area will be delineated in the site specific work plan(s)].

Contours

Spot Elevation

× 336.9

Building or Facility With ID Number

T-3941

Parcel Boundary

Approximate Range Fan Position at Base Closure

Historical Range Fans 1945

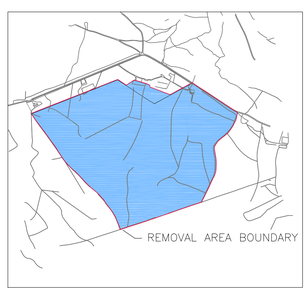
Historical Range Fans 1984

Approximate Target Location

×

Boundary Between Development and Habitat Areas

INSET SCALE 1" = 2000'



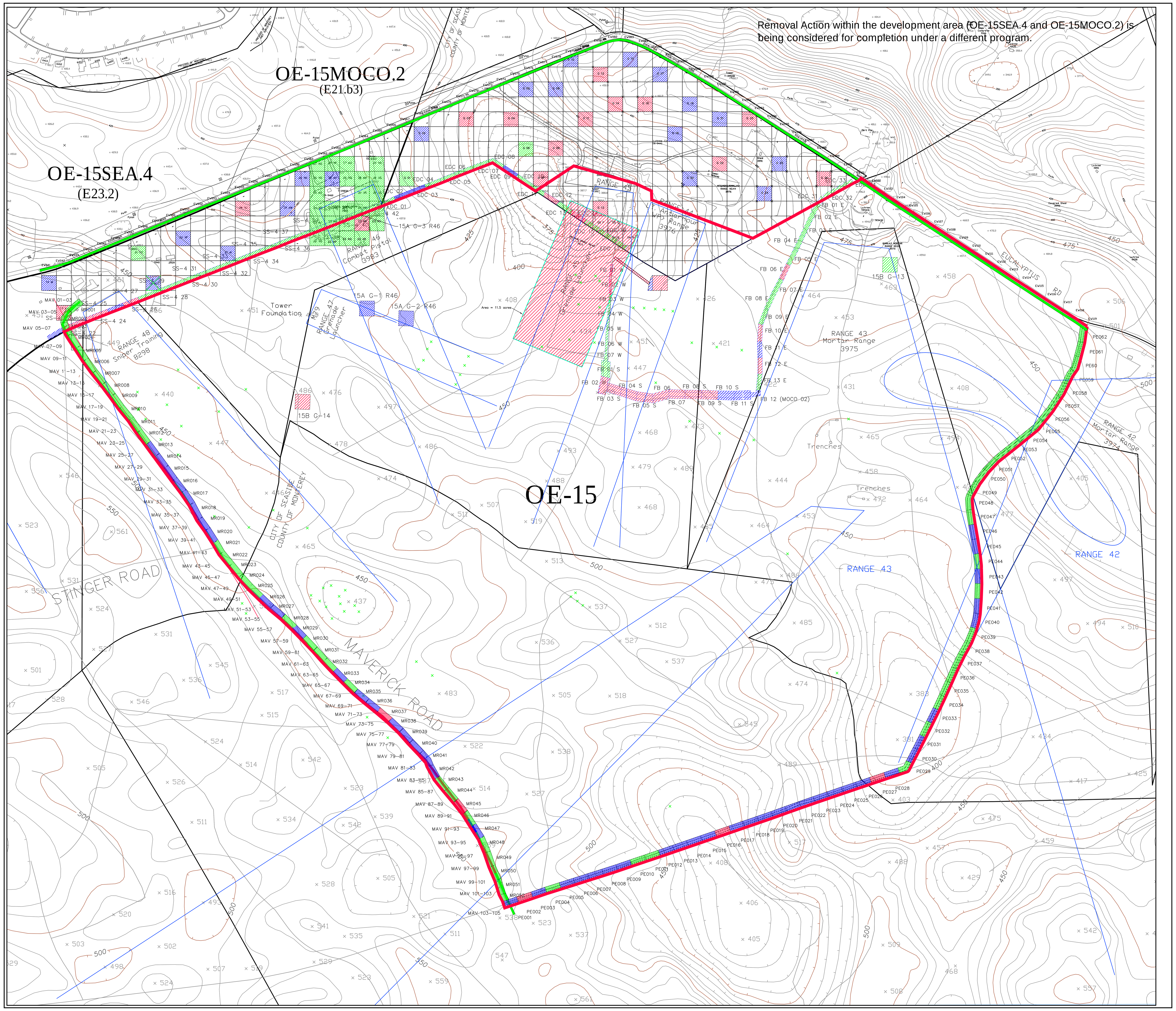
NO.	DATE	REVISIONS	HLA FILE NO.	PROJECT NO.	APPROVED	APPROVAL DATE	DRAWN BY
1	10/17/01	DRAFT	46310007	46310 001715			MEK
2	1/02	DRAFT FINAL					

Harding ESE
A MACTEC Company

Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study Former Fort Ord, California

Ranges 43 through 48
Historical Range Features

PLATE: 3



Removal Area Boundary

[For illustrative purpose only. Actual limits of removal area will be delineated in the site specific work plan(s)].

Parcel Boundary

Contours

Spot Elev.

× 336.9

Building or Facility With ID Number

T-3941

UXO Swept Fuel Break

UXO Live

Ordnance Scrap

No UXO

Approximate Range Fan Position at Base Closure

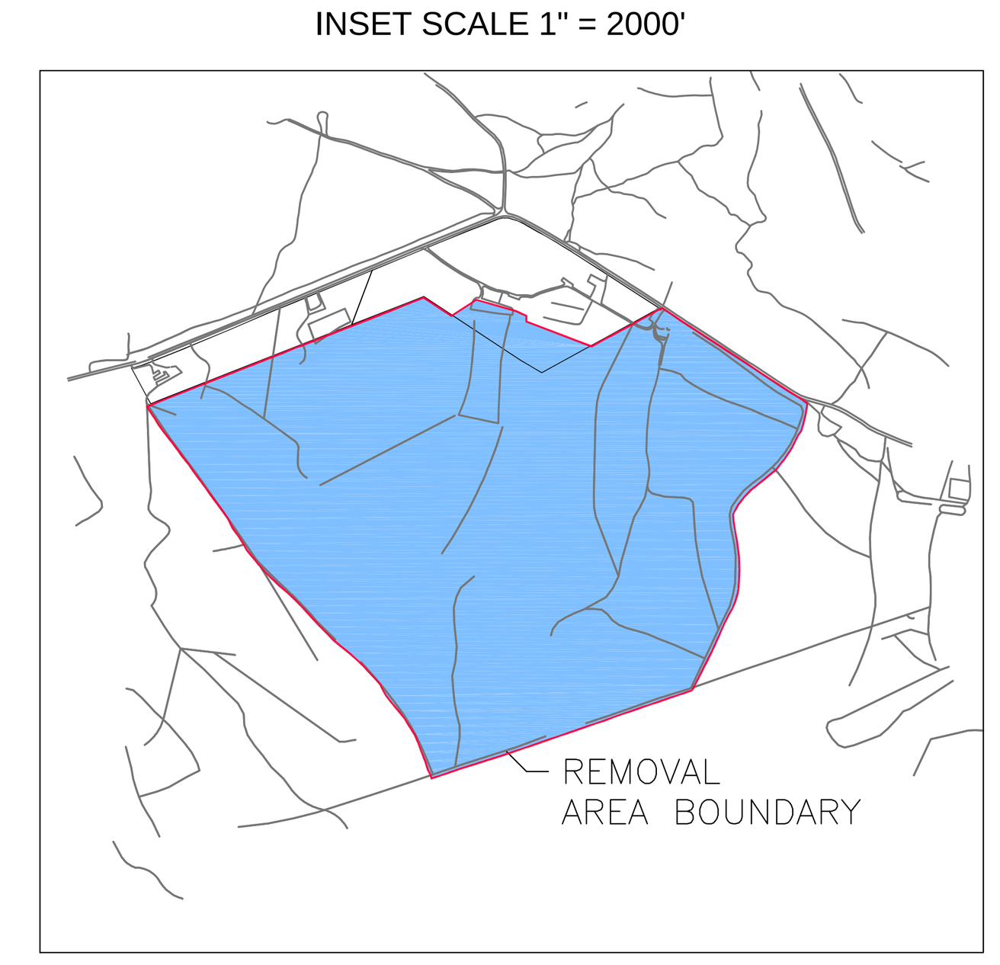
Approximate Target Location

Note:

Pipeline Road grids are labeled PE on this plate. Data corresponding to the interior section of each PE grid are labeled PR in Table 2.

PE004 (Exterior portion of grid)
PR004 (Interior portion of grid)
PE004 (Exterior portion of grid)

INSET SCALE 1" = 2000'



0 300 600

SCALE IN FEET

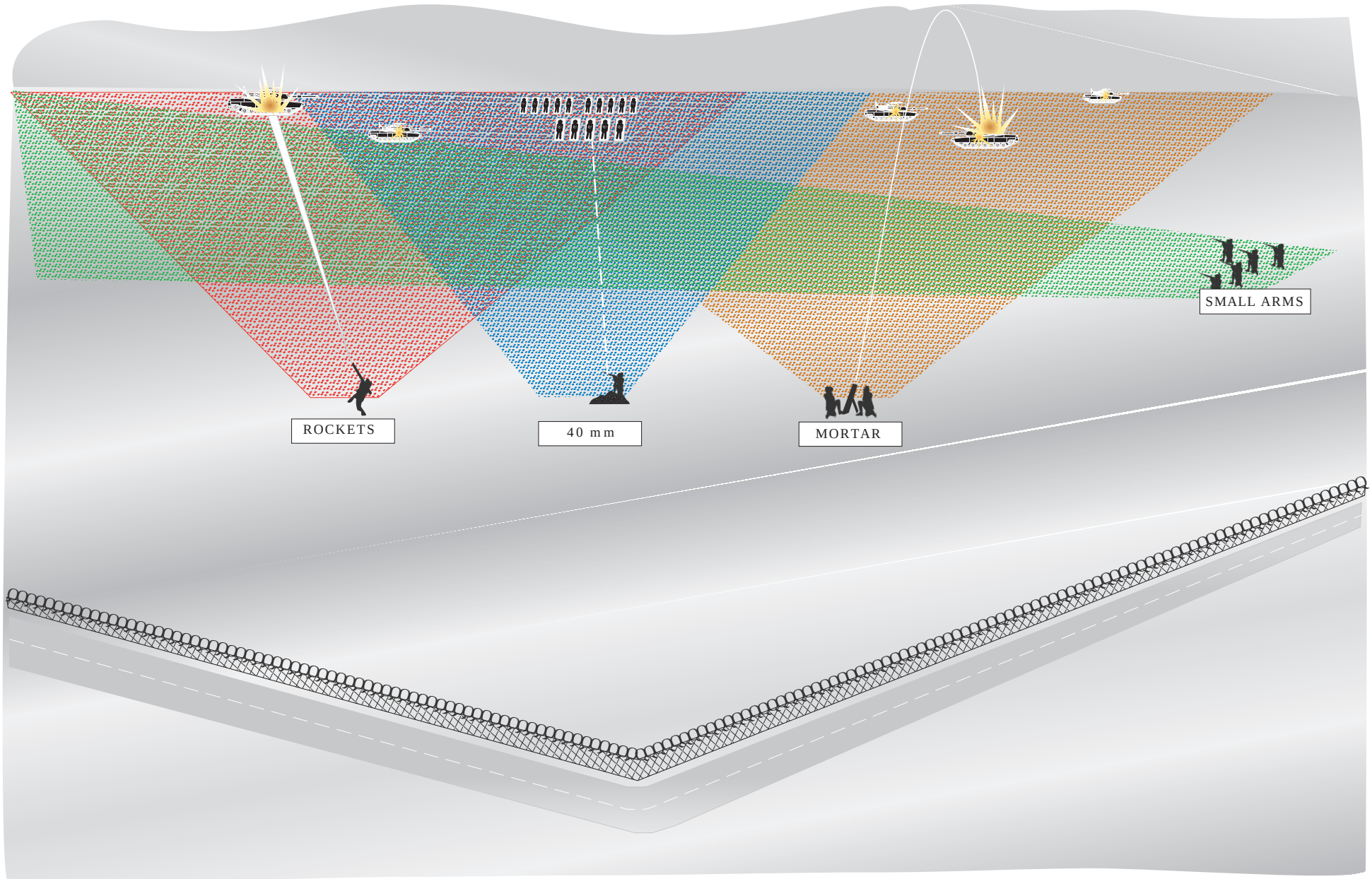
NO.	DATE	REVISIONS	HLA FILE NO.	PROJECT NO.	APPROVED	APPROVAL DATE	DRAWN BY
1	10/16/01	DRAFT	46310008	46310 001715			MEK
2	1/02	DRAFT FINAL					

Harding ESE
A MACTEC Company

Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord, California

Ranges 43 through 48
Sample Grid Locations

PLATE:
4



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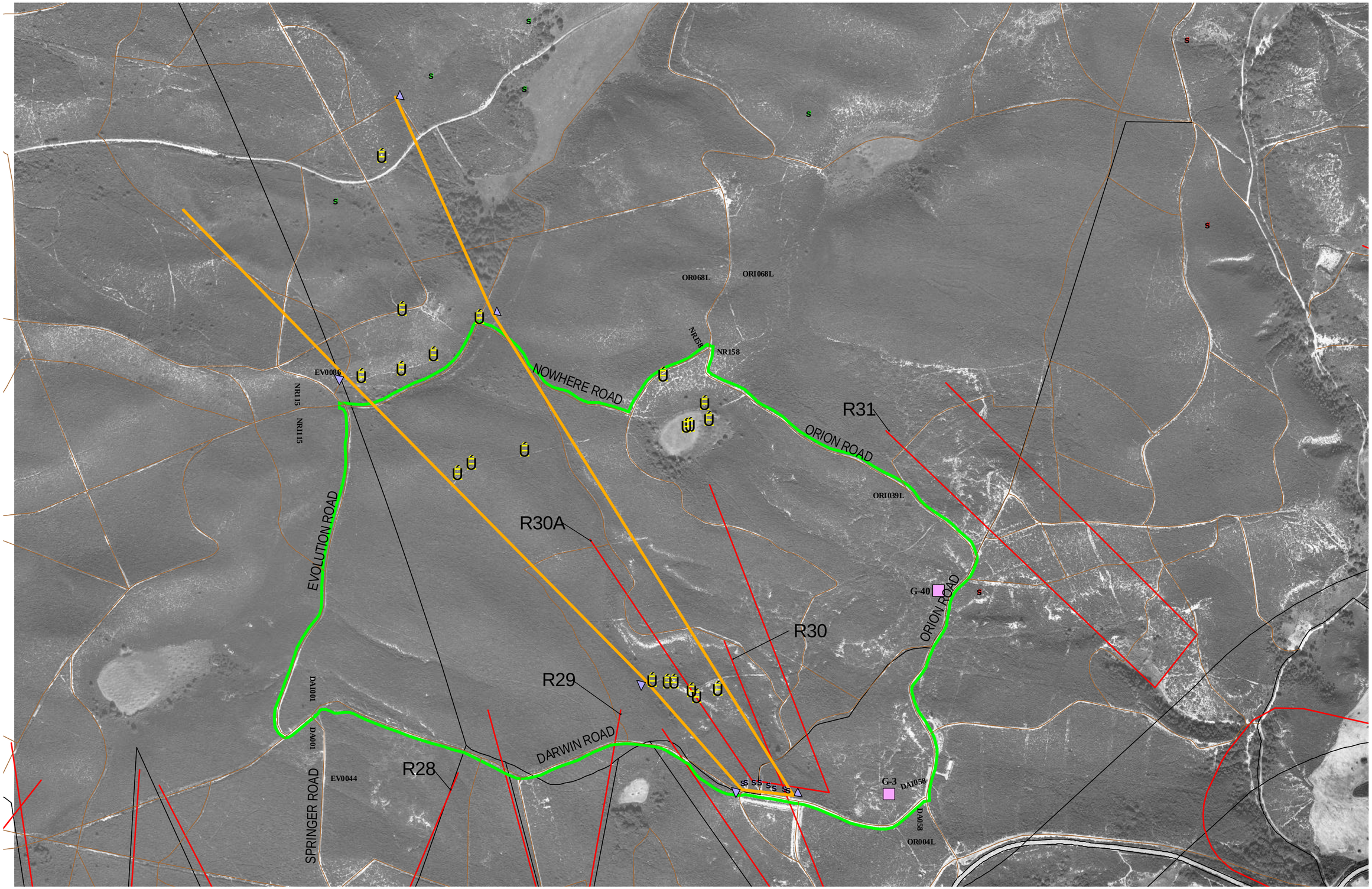
Ranges 43 through 48 Conceptual Site Model
Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord
Monterey, California

PLATE
5

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED
LK	46310 001715		10/01	1/02



EXPLANATION

- Range 30A Fuel Break Boundary
- Base Ranges Interpreted from Historical Maps
- Approximate Range 30A Limits based on ground evidence (targets and range markers)
- Reuse Parcels
- Trails
- MRA Sampling Grids
- Targets
- Firing Points
- Range Limit Markers
- Helicopter Fire Point
- Helicopter Target

Note: DAI001, NR115, OR1039L, etc, indicate grid identification labels. These labels are endpoint grids along fuel breaks. This information is provided for reference.

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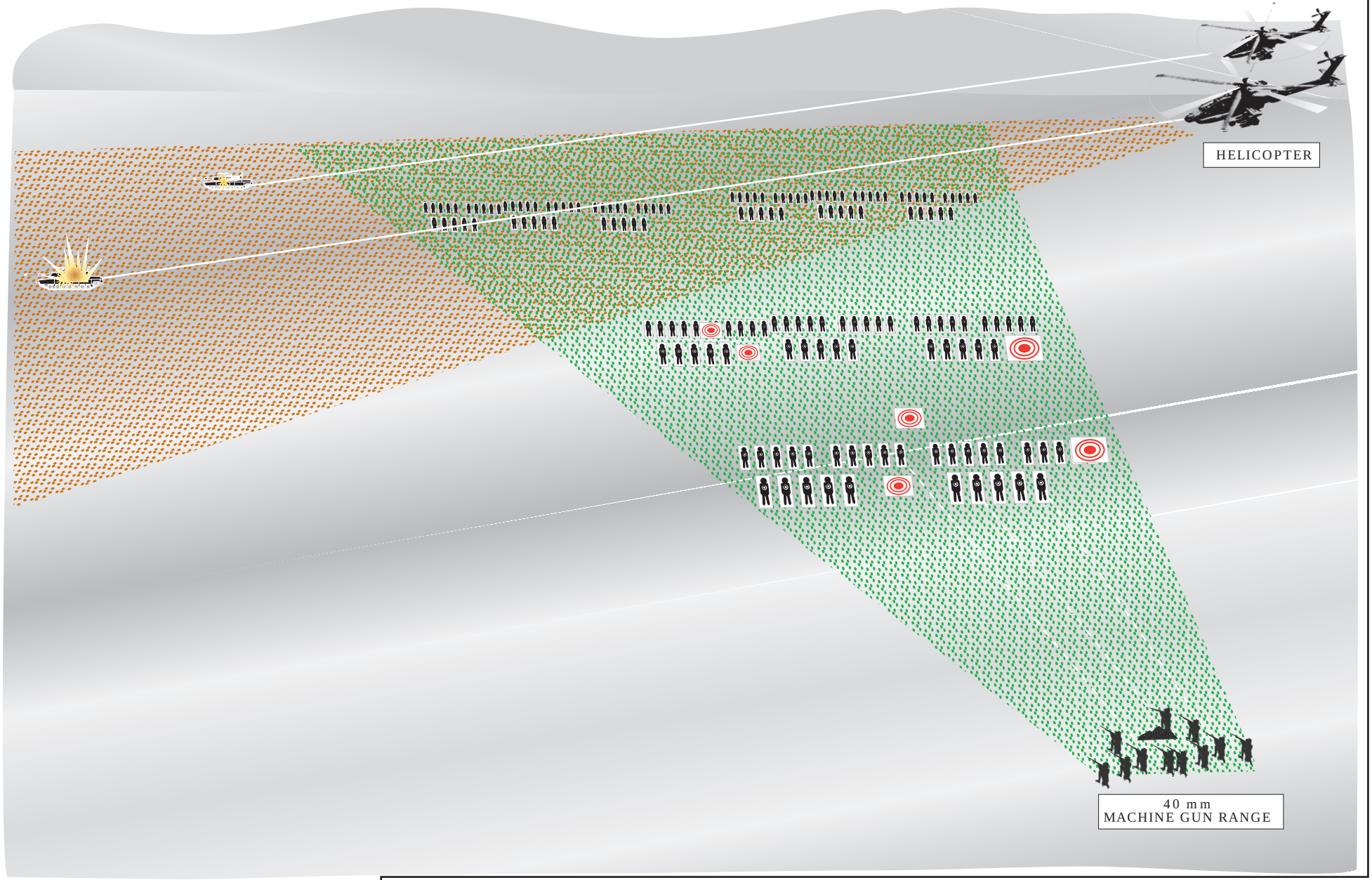
Range 30A, Historical Features with 1999 Aerial Photograph

Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord
Monterey County, California

PLATE 6

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
JCB	46310 001715		9/01	

ia_rifs.apr - Fort Ord GIS - 9/18/01



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Range 30A Conceptual Site Model
Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord
Monterey, California

PLATE
7

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED
LK	46310 001715		10/01	1/02

PARKER FLATS

WATKINS GATE

EUCALYPTUS

Bazooka Practice

Possible Targets

Possible Firing Points

FB 01 FB 02 FB 03 FB 04 FB 05 FB 06 FB 07 FB 08 FB 09 FB 10 FB 11 FB 12 FB 13 FB 14 FB 15 FB 16 FB 17 FB 18 FB 19 FB 20 FB 21 FB 22 FB 23 FB 24 FB 25 FB 26 FB 27 FB 28 FB 29 FB 30 FB 31 FB 32 FB 33 FB 34

FB W01 FB W02 FB W03 FB W04 FB W05

S

N

200 0 200 Feet

EXPLANATION

- S — UXO Encountered During Fuel Break Clearance
- Squad Tactics Training Area (1956)
- Ordnance Detection and Discrimination Study Investigation Area
- Fuel Break Clearance Area
- Bazooka Practice Area (1945)
- Site OE-16 Interim Action Boundary and Fence
- Site OE-16 Boundary from the Archive Search Report

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Site OE-16, Historical Range and Training Site
Features with 1949 Aerial Photograph
Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord
Monterey County, California

PLATE 8

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
JCB	46310 001715		10/01	

ia_riffs.apr - Fort Ord GIS - 10/15/01

EXPLANATION

- s — UXO Encountered During Fuel Break Clearance
- Ordnance Detection and Discrimination Study Investigation Area
- Fuel Break Clearance Area
- Recoilless Rifle Training Area (RRTA) (1967)
- Training Facilities (1984)
- Site OE-16 Interim Action Boundary and Fence
- Site OE-16 Boundary from the Archive Search Report

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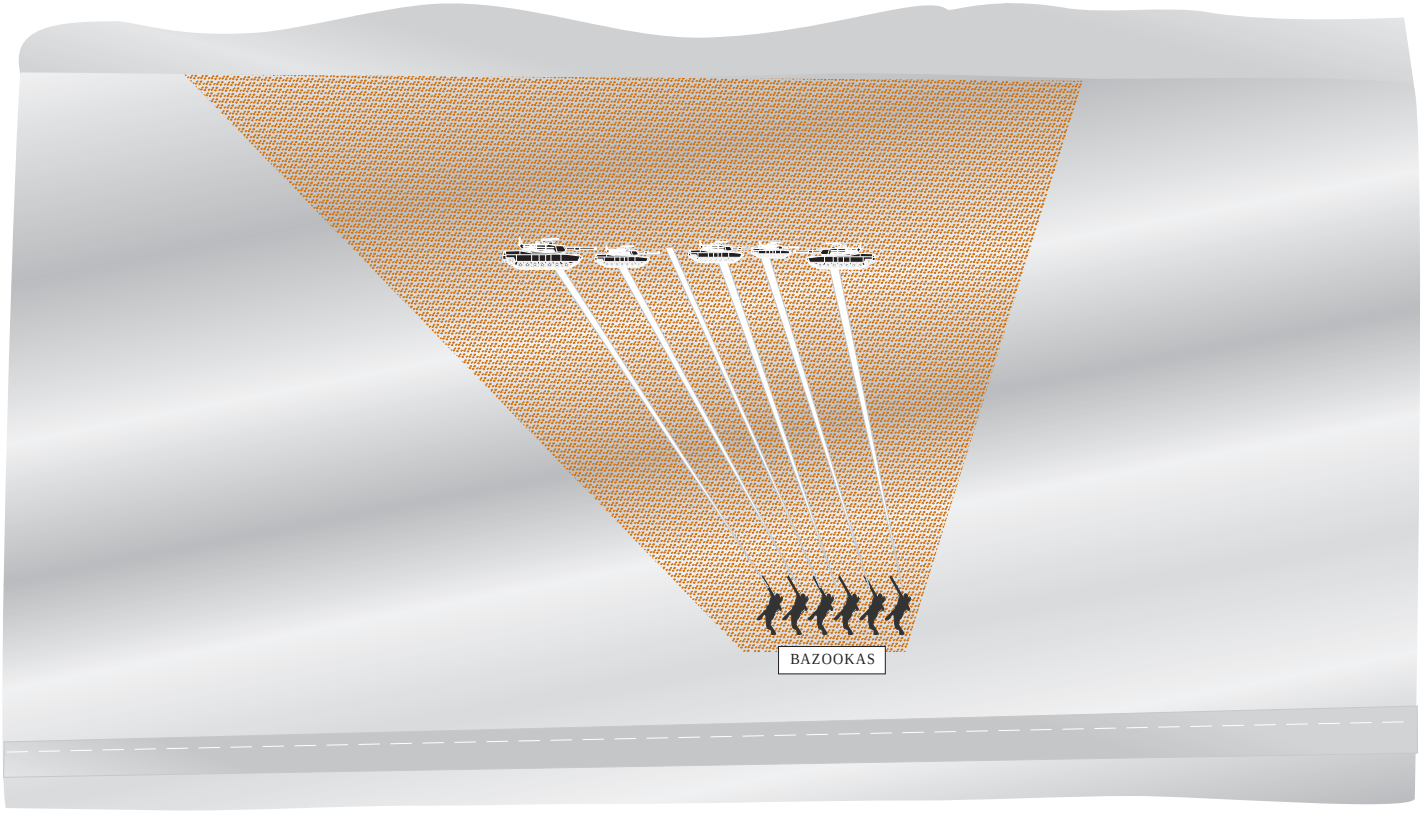
Site OE-16, Historical Range and Training Site Features with 1989 Aerial Photograph
Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord
Monterey County, California

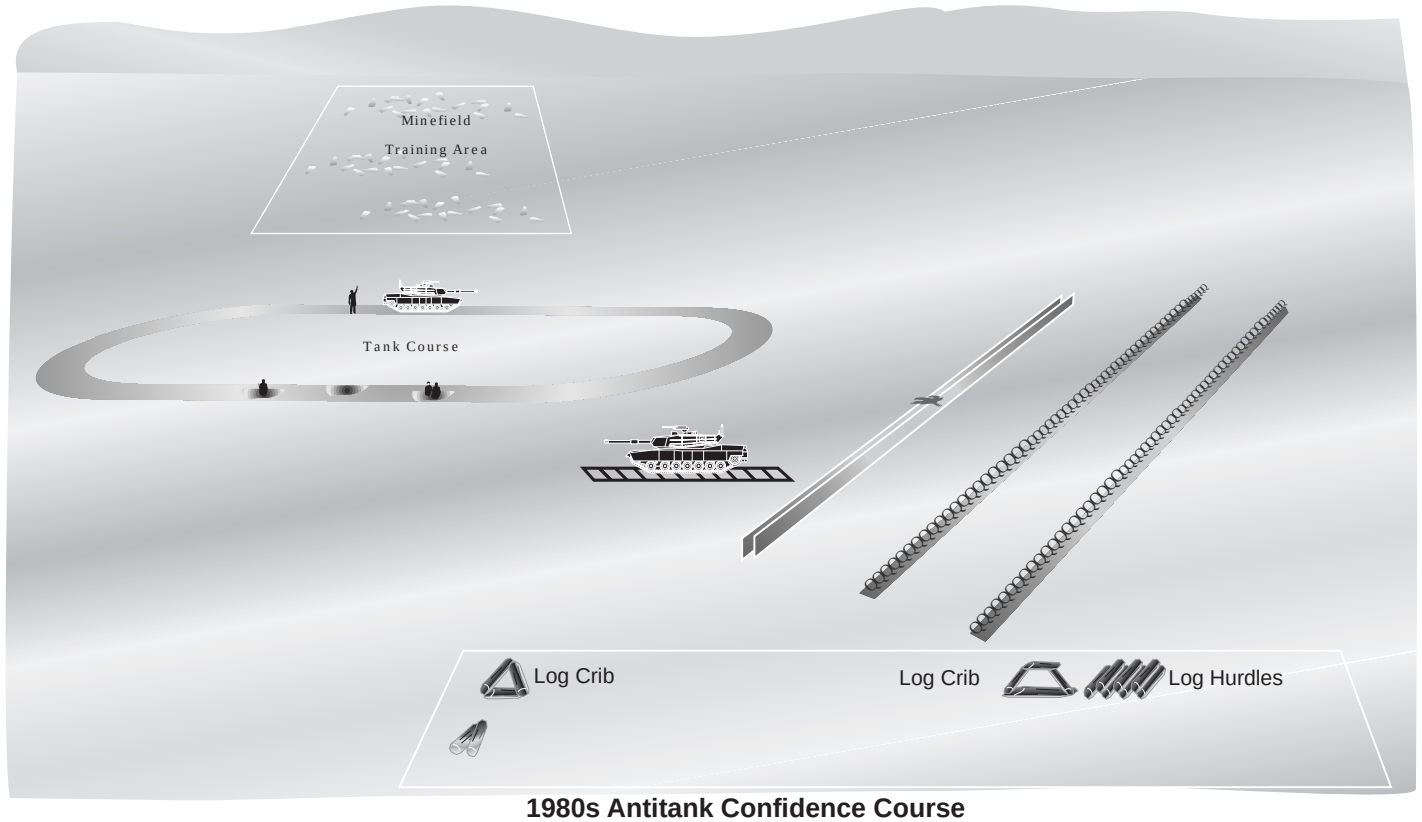
PLATE 9

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
JCB	46310 001715		10/01	

ia_rifs.apr - Fort Ord GIS - 10/15/01



1945 Bazooka Practice Range



1980s Antitank Confidence Course

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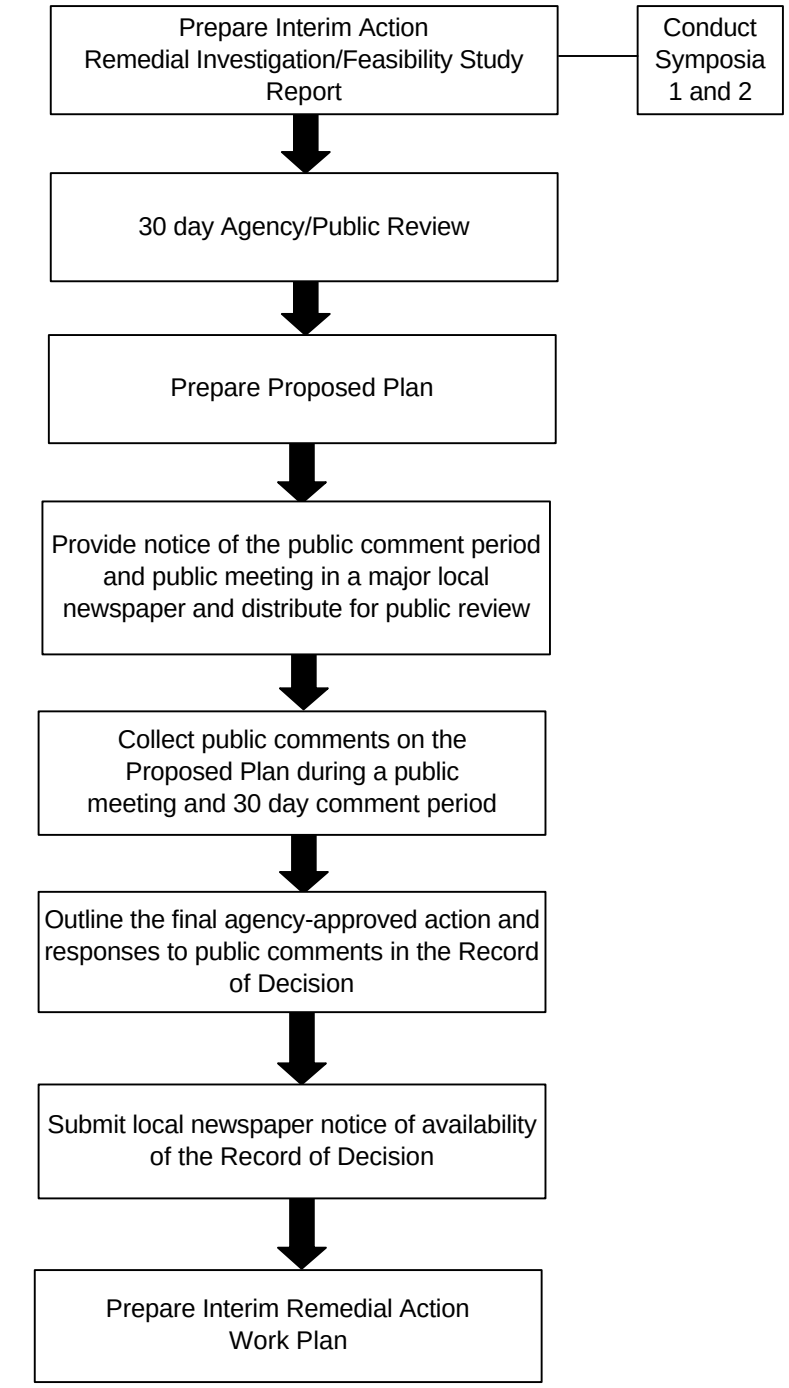
Site OE-16, Conceptual Site Models, 1945 and 1980s
Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord
Monterey, California

PLATE
10

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED
LK	46310 001715		10/01	1/02



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Implementation Process Flow Chart for Interim Action
Interim Action Ordnance and Explosives
Remedial Investigation/Feasibility Study
Former Fort Ord, California

PLATE
11

DRAWN	PROJECT NUMBER	APPROVED BY	DATE	DATE REVISED
LK	46310 001715		10/01	

APPENDIX A

SCREENING EVALUATION OF VEGETATION CLEARANCE METHODS

APPENDIX A

TABLE OF CONTENTS

TABLE

APPENDIX A
SCREENING EVALUATION OF VEGETATION CLEARANCE METHODS

A1.0 INTRODUCTION

This Screening Evaluation of Vegetation Clearance Methods (Evaluation) identifies, evaluates and screens applicable vegetation clearance methods suitable for use during Interim Actions being considered under the accompanying *Ordnance and Explosives Interim Action Remedial Investigation/Feasibility Study, For Ranges 43-48, Range 30A, and Site OE-16 [IA sites] at Former Fort Ord, California [IA RI/FS]*. Due to the type of unexploded ordnance (UXO) present at these IA sites, their close proximity to residential areas, and the history of trespassing incidents at these sites, remedial actions are being evaluated for these IA sites. Vegetation clearance must be performed prior to conducting remedial action to improve visual identification of UXO on the ground surface; therefore, the objectives of this Evaluation are to:

1. Identify vegetation clearance methods that can clear vegetation to bare ground or approximately 6 inches above ground surface to allow for proper operation of UXO detection equipment and provide the required ground surface visibility for OE remedial workers, without causing unacceptable impacts to human health or the environment.

2. Evaluate a range of methods and select alternatives for analysis in the accompanying IA RI/FS that are the most effective, implementable and cost effective at clearing vegetation to allow OE remedial workers to then safely locate and remove UXO from the IA sites.

This Evaluation is organized as follows:

A1.0 Introduction

Presents the objectives of this Evaluation.

A2.0 Identification and Description of Vegetation Clearance Methods

Identifies and describes the vegetation clearance methods that are potentially applicable for each of the IA sites based on a variety of important site-specific parameters.

A3.0 Screening of Vegetation Clearance Methods and Evaluation of Alternatives

Evaluates each of the methods based on the Screening criteria, provides the rationale for elimination of methods that do not meet the criteria, and presents the evaluation of the alternatives that were retained for further consideration.

A4.0 References

Provides a list of references cited in this Appendix.

A2.0 IDENTIFICATION AND DESCRIPTION OF VEGETATION CLEARANCE METHODS

A range of vegetation clearance methods identified as potentially applicable for clearing vegetation at the IA sites are evaluated herein: (1) No Action, (2) Manual, Mechanical, and Remotely-Operated Mechanical Clearing, (3) Prescribed Burning, (4) Animal Grazing, and (5) Herbicide Application. This section presents a description of each method, and a discussion of the following parameters:

1. How the Method is Carried Out in the Field
2. Worker Exposure to UXO
3. Accidental Detonation of UXO
4. Duration of the Vegetation Clearance Method
5. Air Emissions
6. Erosion
7. Impacts to Protected and Other Natural Resources
8. Use at Fort Ord or Other Sites and Under What Conditions
9. Availability of Equipment and Personnel
10. Deposition of Vegetation
11. Visibility of Ground Surface
12. Regrowth of Vegetation and Maintenance Requirements
13. Level of Effort in Terms of Personnel.

The general descriptions of vegetation clearance methods presented below are applicable to all three IA sites because the terrain and vegetation are similar at these sites and the methods are potentially applicable to any type of vegetation clearance at Fort Ord. In instances where there is a difference in site-specific conditions between the IA sites when discussing the above parameters, however, site-specific characteristics will be described for each of the IA sites.

A2.1 No Action

Taking No Action would not clear vegetation from the IA sites prior to OE Remedial Actions and is only considered as a baseline against which to compare other methods as required under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

A2.2 Manual, Mechanical, and Remotely-Operated Mechanical Vegetation Clearance

These methods are grouped together because they all physically cut the vegetation; however, they differ from one another in terms of the level of safety during implementation, their applicability under site-specific conditions, and impacts to human health and the environment associated with their use. These methods include vegetation clearance by a human operator using hand tools or mechanized equipment, either by direct or remote operation. The purpose of these methods is to cut vegetation that will allow access to the IA sites by OE workers. The distinction between each of these methods is a function of the labor involved in operating the equipment and the degree of potential worker exposure to UXO during clearing activities.

- Manual Clearing is conducted by an operator that is on foot and in the work area being cleared while operating the equipment. Examples would be a worker using pruning shears or a hand held trimmer fitted with a brush blade.

- Mechanical Clearing is conducted by an operator situated on self-propelled equipment in the work area being cleared. An example would be a worker operating a tractor from inside the cab.

- Remotely-Operated Mechanical Clearing is conducted by an operator situated at a remote location away from the work area while operating self-propelled equipment within the work area. An example would be the worker operating heavy equipment such as a Tractor-Accessorized Zeirreisst (TAZ) unit via radio control from a distance of 100 feet away.

The ease of use of each of these vegetation clearance methods is in part a function of slope angle, and the height and density of vegetation. The terrain at the IA sites in some areas slopes slightly to moderately with angles ranging from 0 to less than 20 percent (0 to 10 degrees); therefore, the slope angle is not steep enough to affect the performance of the mechanized equipment. Vegetation clearance performed as part of previous removal actions at Fort Ord were mostly concentrated in the northern portion of the base where manual and mechanized clearance methods were used in designated development areas where surface UXO was not present.

Descriptions of each method, including how they are performed, their applicability at the IA sites, and the degree to which the method affects human health, worker safety, and the environment are presented below. Each of the three cutting methods are described based on the parameters listed above.

A2.2.1 Manual Clearance

How the Method is Carried Out in the Field

This method involves cutting and clearing of vegetation using motorized chainsaws, power chippers, mowers, weed eaters and non-motorized hand tools such as clippers and loppers. Small diameter or short shrubs could be cut and hand-carried to a staging or stockpiling area for chipping or disposal. Large diameter shrubs and trees could be "limbed up" to allow access under the canopy by OE workers. This method is effective at selectively removing vegetation.

Worker Exposure to UXO

Manually cutting vegetation would expose workers to UXO that is present in areas being cleared, which if accidentally detonated, could cause serious injury or death. Proper worker awareness, protective equipment and care could reduce worker exposure to injury. The type of UXO present at the IA sites is extremely sensitive and highly dangerous, and could potentially be suspended in the branches of the vegetation being cleared, where it could cause serious injury or death to workers.

Accidental Detonation of UXO

In the case of accidental detonation of UXO, manual cutting would expose workers to flying fragments or blast debris depending on the distance to, and the type and size of the UXO. In general, the possibility exists for any vegetation clearance method applied at the IA sites to detonate UXO. Manual cutting has a high likelihood of causing serious injury or death of workers. Mitigation of potential public exposure to flying fragments or blast debris from accidental detonation of UXO during vegetation clearance activities would be addressed in the site health and safety plan for individual areas. In addition, a community safety plan would be provided to present information regarding accidental and intentional detonation of UXO. In general, potential public exposure would be prevented by: (1) conducting a pre-field analysis of the type, size and orientation of the UXO known or expected to be present in a given area and its proximity to the public, (2) calculation of the maximum distance flying fragments or blast debris would travel based on the type and size of UXO, and (3) implementation of mitigation measures if necessary to prevent public exposure.

Duration of the Vegetation Clearance Method

Manual vegetation clearance at the IA sites using two 6-person crews operating at 2 acres per day would take approximately 40 weeks (10 months) for the 483 acres at Ranges 43-48; approximately 28 weeks (7 months) for the 388 acres at Range 30A; and approximately 6 weeks (1.5 months) for the 80 acres at Site OE-16.

Air Emissions

Air emissions from manual clearing and potential emissions from accidentally detonated UXO are believed to be insignificant with regards to impacts to human health, the environment and worker safety.

Erosion

Manual vegetation clearance could be used on slopes where equipment access is not possible or safe to operate. Manual clearance would cause a minimum of surface disturbance in the short term and would remove only plant material that interferes with visibility and access to UXO; however, cutting vegetation could cause erosion in the long term because this method is likely to result in lower diversity and abundance of vegetation.

Impacts to Protected and Other Natural Resources

Cutting would have adverse impacts on rare, threatened, endangered, and native plant species present at the IA sites during and after implementation of cutting because it cannot be applied selectively to non-threatened or endangered plants and species (Table 1 of the accompanying IA RI/FS). If cutting were used to clear Central Maritime Chaparral (CMC) vegetation, natural re-vegetation of the area would likely be less diverse and abundant and contain fewer threatened, endangered, and native plant species than present in vegetation communities prior to cutting. Cutting may result in converting existing high quality CMC habitat to a more common and lower quality habitat type. Thus, cutting would not be protective of current environmental conditions in terms of the presence of habitat containing threatened, endangered, and native plant species. These anticipated results are based on preliminary observations made during monitoring of habitat recovery after vegetation clearance at Fort Ord conducted under the HMP monitoring program, which indicated the following:

- Seedlings of HMP shrubs were rarely observed in cut areas after clearance activities. A preliminary evaluation indicated HMP shrub regeneration of only 29 seedlings per acre occurred after cutting as compared to 3,000 seedlings per acre after burning.
- Species diversity was generally lower in cut areas.
- Fewer native herbaceous species were observed in cut areas.

Cutting and placing cut vegetation in windrows and mulch piles on the ground surface appeared to interfere with natural chaparral re-vegetation by occupying habitat and shading the under-story and reducing germination by shrub and herbaceous species.

In addition, because CMC habitat contains protected species at these sites, resource management measures are required by United States Department of the Interior, Fish and Wildlife Service (USFWS). Implementation of cutting in areas greater than 50 acres in size would not be consistent with the Biological and Conference Opinion (*USFWS, 1993; 1997*) issued by USFWS in accordance with the Endangered Species Act.

Use at Fort Ord or Other Sites and Under What Conditions

Manual vegetation clearance has been used extensively in development areas and on a limited basis in designated CMC habitat reserve areas at the former Fort Ord under special circumstances where burns cannot be conducted

or terrain is extremely steep. OE contractors typically use a manual brush clearance team consisting of a UXO supervisor and several laborers. Vegetation would be trimmed only to the extent necessary to allow safe access for OE workers.

Availability of Equipment and Personnel

Equipment necessary for manual cutting may be available; however, two 6-person crews would have to be available to work full time for approximately 40 weeks (10 months) to clear Ranges 43-48, 28 weeks (7 months) to clear Range 30A, and 6 weeks (1.5 months) of vegetation.

Deposition of Vegetation

Vegetation that is cut would typically be hauled to a staging area onsite where it would be chipped or shredded, which would require these areas first be cleared of vegetation and UXO. Recovery of many rare, threatened, or endangered species could be inhibited by a thick layer of woody cuttings, thus inhibiting germination.

Visibility of Ground Surface

Safety procedures require the vegetation be cleared to bare ground or approximately 6 inches above ground surface to allow for proper operation of UXO detection equipment and prevent the accidental detonation of UXO on the surface while providing clear enough ground surface visibility for OE workers. This level of clearance could be achieved using manual methods; however, the smaller cuttings generally fall to the ground where they may obscure or cover UXO. The larger cuttings could be gathered and hauled to a staging area for chipping or disposal.

Regrowth of Vegetation and Maintenance Requirements

Vegetation cleared by manual methods would not likely require additional cutting if each area has an OE Remedial Action immediately following vegetation clearance; however, standards for long term maintenance of manually cleared vegetation are not known and have not been established.

Level of Effort in Terms of Personnel

Manual clearance would require coordination of labor crews accompanied by UXO specialists working with vegetation clearance workers at a rate of 2 acres per day using two 6-person crews over a period of 40 weeks (10 months) for the 483 acres at Ranges 43-48, 28 weeks (7 months) for the 388 acres at Range 30A, and 6 weeks (1.5 months) for the 80 acres at Site OE-16.

A2.2.2 Mechanical Vegetation Clearance

How the Method is Carried Out in the Field

This method consists of using human-operated equipment in 3 basic configurations to cut vegetation: Tractor pulled, track-carriers with booms and skid-steer. These types of equipment have been given product names such as the Brush hog, Hydro-Ax, TAZ, and Brontosaurus and are described below. Equipment operators maneuver the equipment onto the OE sites to clear the vegetation.

Worker Exposure to UXO

Mechanically cutting vegetation would expose workers to UXO that is potentially present in areas being cleared, which if accidentally detonated, could cause serious injury or death. Although the machinery being operated could potentially separate the workers from direct contact with UXO and proper worker awareness, protective equipment and care could reduce worker exposure to injury, the type of UXO present at the IA sites is extremely sensitive and in some cases, high explosive antitank (HEAT) armor piercing ammunition which is designed to destroy heavy equipment may be present.

Accidental Detonation of UXO

In the case of accidental detonation of UXO, mechanical cutting would directly expose the

equipment operator or other workers to flying fragments or blast debris depending on distance to, and the type and size of the UXO. In general, the possibility exists for any vegetation clearance method applied at the IA sites to detonate UXO. Mechanical cutting has a high likelihood of causing serious injury or death of workers because they would only be separated from direct contact by heavy equipment, and some types of UXO such as high explosive antitank (HEAT) armor piercing ammunition is designed specifically to destroy heavy equipment. Mitigation of potential public exposure to flying fragments or blast debris from accidental detonation of UXO during vegetation clearance activities would be addressed in the site health and safety plan for individual areas. In addition, a community safety plan would be provided to present information regarding accidental and intentional detonation of UXO. In general, potential public exposure would be prevented by: (1) conducting a pre-field analysis of the type, size and orientation of the UXO known or expected to be present in a given area and its proximity to the public,
(2) calculation of the maximum distance flying fragments or blast debris would travel based on the type and size of UXO, and
(3) implementation of mitigation measures if necessary to prevent public exposure.

Duration of the Vegetation Clearance Method

Mechanical vegetation clearance at a rate of 2.5 acres per day (two passes at 5 acres per day; one pass to clear to 2 feet and a second pass to clear to bare ground or approximately 6 inches above ground surface) would take approximately 32 weeks (8 months) for the 483 acres at Ranges 43-48, 22 weeks (5.5 months) for the 388 acres at Range 30A, and 5 weeks (1.25 months) for the 80 acres at Site OE-16.

Air Emissions

Potential emissions from mechanically operated equipment or accidentally detonated UXO are believed to be insignificant with regards to impacts to human health, the environment and worker safety.

Erosion

Mechanical vegetation clearance has the potential to cause surface disturbance and erosion in the short term due to cutting equipment scalping the surface and equipment tires or tracks that could create ruts that lead to erosion. Mechanically cutting vegetation could also cause erosion in the long term because this method is likely to result in lower diversity and abundance of vegetation.

Impacts to Protected and Other Natural Resources

Cutting would have adverse impacts on threatened, endangered, and native plant species present at the IA sites during and after implementation of cutting because it cannot be applied selectively to non-threatened or endangered plants and species (Table 1 of the accompanying IA RI/FS). If CMC vegetation is cleared by herbicide application, it likely will not grow back as diverse or as abundant and may result in converting CMC habitat to a more common habitat type. If cutting were used to clear CMC vegetation, natural re-vegetation of the area would likely be less diverse and abundant and contain fewer threatened, endangered, and native plant species than present in vegetation communities prior to cutting. Cutting may result in converting existing high quality CMC habitat to a more common and lower quality habitat type. Thus, cutting would not be protective of current environmental conditions in terms of the presence of habitat containing threatened, endangered, and native plant species. These anticipated results are based on preliminary observations made during monitoring of habitat recovery after vegetation clearance at Fort Ord conducted under the HMP monitoring program, which indicated the following:

- Seedlings of HMP shrubs were rarely observed in cut areas after clearance activities. A preliminary evaluation indicated HMP shrub regeneration of only 29 seedlings per acre occurred after cutting

as compared to 3,000 seedlings per acre after burning.

- Species diversity was generally lower in cut areas.
- Fewer native herbaceous species were observed in cut areas.

Cutting and placing cut vegetation in windrows and mulch piles on the ground surface appeared to interfere with natural chaparral re-vegetation by occupying habitat and shading the under-story and reducing germination by shrub and herbaceous species.

In addition, some mechanical methods cause damage to the soil topography by creating ruts and increasing the threat of erosion and are likely to result in lower diversity and abundance of vegetation. If CMC vegetation is cleared by cutting, it likely will not grow back as diverse or as abundant and may result in converting CMC habitat to a more common habitat type. In addition, because CMC habitat contains protected species at the IA sites, resource management measures are required by USFWS. Implementation of cutting in areas greater than 50 acres in size would not be consistent with the Biological and Conference Opinion (*USFWS, 1993; 1997*) issued by USFWS in accordance with the Endangered Species Act.

Use at Fort Ord or Other Sites and Under What Conditions

Mechanical vegetation clearance has been used extensively at the former Fort Ord in development areas and on a limited basis where burning cannot be conducted. Mechanical vegetation clearance was used previously in limited areas behind the firing lines only, to support OE investigation. Two mechanized methods that have been used at Fort Ord include the Brush Hog and TAZ as described below. Vegetation would be trimmed only to the extent necessary to allow safe access for OE workers.

Availability of Equipment and Personnel

Equipment necessary for mechanical cutting may be readily available; however, operators would have to be available to work full time for approximately 32 weeks (8 months) to clear vegetation over the 483 acres at Ranges 43-48, 22 weeks (5.5 months) to clear vegetation over the 388 acres at Range 30A, and 5 weeks (1.25 months) to clear vegetation over the 80 acres at Site OE-16.

Deposition of Vegetation

Vegetation that is cut would chipped or shredded would fall onto the ground, covering UXO and reducing visibility. Recovery of many rare, threatened, or endangered species could be inhibited by a thick layer of woody cuttings, thus inhibiting germination.

Visibility of Ground Surface

Safety procedures require the vegetation be cleared to bare ground or approximately 6 inches above ground surface to allow for proper operation of UXO detection equipment and prevent the accidental detonation of UXO on the surface. This level of clearance may be achievable using mechanical methods; however, the cuttings generally fall to the ground where they could obscure or cover UXO.

Regrowth of Vegetation and Maintenance Requirements

Vegetation cleared by mechanical methods would not likely require additional cutting if each area has an OE Remedial Action immediately following vegetation clearance; however, standards for long term maintenance of mechanically cleared vegetation are not known and have not been established. Recovery of vegetation would be inhibited because the ground would be covered preventing germination of threatened or endangered species.

Level of Effort in Terms of Personnel

Mechanical clearance would require coordination of labor crews and UXO specialists working with vegetation clearance workers at a rate of 2.5 acres per day per crew over a period of approximately 32 weeks (8 months) to clear vegetation over the 483 acres at Ranges 43-48, 22 weeks (5.5 months) to clear vegetation over the 388 acres at Range 30A, and 5 weeks (1.25 months) to clear vegetation over the 80 acres at Site OE-16.

A description of the types of mechanical equipment available for vegetation clearance is presented below.

A2.2.2.1 Mechanical Equipment

Brush Hog

The term "Brush Hog" is used generically to include a range of proprietary, tractor-pulled, brush-cutting/mulching devices. In general, the device is either side- or rear-mounted and works by cutting and recutting material inside of a casing and gravity distribution of cuttings. The cutting apparatus consist of flails, knives, or a rotary cutter that works by either being driven into or lowered onto the vegetation. The implement could be attached to range of tracked or wheeled tractors. The cut material varies in size, depending on the residence time in the cutter chamber.

This method is effective in removing top growth of vegetation up to a size (stem diameter) that varies by manufacturer and type of equipment. In general, plant material up to 5 inches stem diameter could be effectively reduced to mulch. However, growth greater than 5 feet in height can cause problems with equipment operation.

This method involves introduction of equipment and workers into the area to be cleared and requires workers to be in close proximity to a potentially dangerous machine. Brush hog-type equipment tends to generate dust and noise, limiting visibility and communication between the operator and OE workers and observers. The brush hog could be used on a range of slopes, depending on the specifications of the tractor on which the implement is mounted. It is limited by vegetation height however; and can cause 'scalping' of soil and disturbance of surface UXO.

There are two well known brush hog manufacturers; the Loftness and Brown Tree Cutter are described below.

Loftness

Manufacturer of various orchard/brush shredders that come in 6, 7, and 8-foot sizes with a 3-point rear-mount or a hydraulic-driven skid steep-mount. This machinery is both pull behind and push operated.

Brown Tree Cutter

The 2000 series folding deck model allows two distinct types of mowing operations while providing maximum safety. With the deck raised, it could back into and cut standing trees up to 8 inches in diameter; with the folding deck down, it could cut and grind materials that the tractor has already driven over with virtually no discharge. The model 2000 series open deck incorporates a newly designed twin coil pressure bar assembly to give added strength, durability, and better operation. It also reduces the amount of discharged debris.

Tractor-Accessorized Zeirreisst (TAZ)

The TAZ is a mulching head implement mounted on a track carrier. The head consists of a series of hinged flails on a rotating drum inside of a chamber suspended by a boom. It is operated from the cab of the tracklayer. The TAZ works by making a series of passes over the standing vegetation. The flails cut through the vegetation, leaving a coarse mulch. This method has been used at the former Fort Ord. This method appears to be effective at removing vegetation with stem diameter up to 8 inches to a desired height. Field observations indicate that the TAZ could cut to a height of 8 to 12 inches or could cut to ground level. In some areas,

completely uprooted burls of chamise and shaggy bark manzanita have been observed. The tracklayer could cause ruts to form on loose sandy soil.

Similar to the TAZ are the Slashbuster and the Brontosaurus products, described below.

Slashbuster

This rig is an excavator mounted brush cutting attachment. They attach onto larger (20,000 to 100,000 lb.) excavators with long booms and thus are not limited to vegetation height. The Model HD 420B can cut and mulch trees to 14" in diameter and has a 46" cutting swath. There are other models, such as the 480HD, used for a time at Fort Ord that cut larger swaths and have a variety of rotating heads and safety shrouds.

Brontosaurus

This rig has been designed by John Brown & Sons to be used in brush cutting, mowing and snow blowing for right of way work. It is similar in size and capability to the Slashbuster.

Bull Hog/Hydro-Ax

A third configuration, a skid steer arrangement consists of a cutting tool mounted on the front of the carrier. The carrier typically is a rubber-tired propelled, and articulating piece of heavy equipment. One model, the Bull Hog, is designed by Fecon Resource Recovery Equipment & Systems, and can shred brush, undergrowth, trees, stumps, roots, yard waste, logging scraps, and slash at a rate of 50 to 80 cubic yards per hour. It's designer claims that, "there are no limits to the size or quantity of material that can be processed." The cutting tool has cutter teeth that rotate on a revolving drum. The largest model (BH-250) is capable of cutting trees to 16 inches in diameter and clearing brush to well over 10 feet in height. It has been used extensively in Texas to clear sage and mesquite growth from housing developments and along railroad and pipeline corridors.

A2.2.3 Remotely-Operated Mechanical Vegetation Clearance

This is a category of approaches to vegetation clearance that adapt standard mechanical equipment (e.g., those methods described above) via remote control. Although several types of remotely-operated vegetation clearance equipment are currently being researched, they are still in the development stages and are not available. The equipment types can be broken into two basic sub-categories: machines that are designed to only clear vegetation, and machines that are designed to clear surface and subsurface OE (primarily practice mines) and are outfitted with attachments to cut vegetation. In addition, there are firms (OAO Robotics, Applied Research Associates, Inc.) that specialize in rigging any type of equipment for remote operation.

While the precise operating characteristics of each machine have not been observed, general statements can be made.

How the Method is Carried Out in the Field

This method consists of equipment typically operated remotely via radio controls such as the brush hog, Hydro-Ax, Trackless Land Clearance (TLC) machines, modified Bobcat, Tractor-accessorized Chipping Device (Brontosaurus and TAZ) and Track Hoes. Equipment operators maneuver the equipment into areas to clear the vegetation using hand held radio equipment. In some instances, visual surveillance of the area being cleared is conducted using a remote video camera, which may not have the same degree of accuracy in visually identifying and avoiding UXO.

Worker Exposure to UXO

Remotely-operated mechanical cutting of vegetation is intended to isolate workers from direct exposure to UXO that is present in areas being cleared. Although the machinery being operated remotely would separate the workers from direct contact with UXO (from 100 to

3,000 feet depending on type of equipment and manufacturer), the type of UXO present at the IA sites is extremely sensitive and in some cases the fragmentation distance may be greater than the separation distance. In addition, high explosive antitank (HEAT) armor piercing ammunition that is designed to destroy heavy equipment may be present. Although the equipment is designed with sacrificial parts that could be replaced if UXO causes damage that renders the equipment inoperable and some types of remotely-operated equipment have armored undercarriages that may provide some protection against small munitions, certain types of UXO such as the 66mm M72 Light Antitank Weapon (LAW) are designed to penetrate armored undercarriages up to 11 inches thick. Proper worker awareness, protective equipment and care could reduce worker exposure to injury. The type of UXO present at the IA sites is extremely sensitive and highly dangerous, and could potentially be suspended in the branches of the vegetation being cleared, where it could cause serious injury or death to workers.

Accidental Detonation of UXO

In the case of accidental detonation of UXO, remotely-operated mechanical cutting would separate workers from potential exposure to flying fragments or blast debris depending on distance to, and the type and size of the UXO. In general, the possibility exists for any vegetation clearance method applied at the IA sites to detonate UXO. Remotely-operated mechanical cutting would minimize this possibility, although some types of UXO such as high explosive antitank (HEAT) armor piercing ammunition is designed specifically to destroy heavy equipment, which has a high likelihood of causing serious injury or death of workers. Mitigation of potential public exposure to flying fragments or blast debris from accidental detonation of UXO during vegetation clearance activities would be addressed in the site health and safety plan for individual areas. In addition, a community safety plan would be provided to present information regarding accidental and intentional detonation of UXO. In general, potential public exposure would be prevented by: (1) conducting a pre-field analysis of the type, size and orientation of the UXO known or expected to be present in a given area and its proximity to the public, (2) calculation of the maximum distance flying fragments or blast debris would travel based on the type and size of UXO, and (3) implementation of mitigation measures if necessary to prevent public exposure.

Duration of the Vegetation Clearance Method

Remotely-operated mechanical vegetation clearance at a rate of 2 acres per day would take approximately 40 weeks (10 months) over the 483 acres at Ranges 43-48, 28 weeks (7 months) to clear vegetation over the 388 acres at Range 30A, and 6 weeks (1.5 months) to clear vegetation over the 80 acres at Site OE-16. In addition, although remotely-operated equipment would be expected to be capable of operating in similar terrain as standard mechanical equipment, it would likely be somewhat slower because the operator would be relying on video input from the machine to receive topographic conditions, the size of vegetation, obstacles, and other factors. This information would have to be evaluated, and commands for action then relayed to the machine.

Air Emissions

Potential emissions from mechanically operated equipment and accidentally detonated UXO are believed to be insignificant with regards to impacts to human health, the environment and worker safety.

Erosion

Remotely-operated mechanical vegetation clearance has the potential to cause surface disturbance and erosion in the short term due to cutting equipment scalping the surface and equipment tires or tracks could create ruts that lead to erosion. Mechanically cutting vegetation could also cause erosion in the long term because this method is likely to result in lower diversity and abundance of vegetation.

Impacts to Protected and Other Natural Resources

Cutting would have adverse impacts on threatened, endangered, and native plant species present at the IA sites during and after implementation of cutting because it cannot be applied selectively to non-threatened or endangered plants and species (Table 1 of the accompanying IA RI/FS). If CMC vegetation is cleared by herbicide application, it likely will not grow back as diverse or as abundant and may result in converting CMC habitat to a more common habitat type. If cutting were used to clear CMC vegetation, natural re-vegetation of the area would likely be less diverse and abundant and contain fewer threatened, endangered, and native plant species than present in vegetation communities prior to cutting. Cutting may result in converting existing high quality CMC habitat to a more common and lower quality habitat type. Thus, cutting would not be protective of current environmental conditions in terms of the presence of habitat containing threatened, endangered, and native plant species. These anticipated results are based on preliminary observations made during monitoring of habitat recovery after vegetation clearance at Fort Ord conducted under the HMP monitoring program, which indicated the following:

- Seedlings of HMP shrubs were rarely observed in cut areas after clearance activities. A preliminary evaluation indicated HMP shrub regeneration of only 29 seedlings per acre occurred after cutting as compared to 3,000 seedlings per acre after burning.
- Species diversity was generally lower in cut areas
- Fewer native herbaceous species were observed in cut areas.

Cutting and placing cut vegetation in windrows and mulch piles on the ground surface appeared to interfere with natural chaparral re-vegetation by occupying habitat and shading the under-story and reducing germination by shrub and herbaceous species.

In addition, some mechanical methods cause damage to the soil topography by creating ruts and increasing the threat of erosion and are likely to result in lower diversity and abundance of vegetation. If CMC vegetation is cleared by cutting, it likely will not grow back as diverse or as abundant and may result in converting CMC habitat to a more common habitat type. In addition, because CMC habitat contains protected species at these IA sites, resource management measures are required by USFWS. Implementation of cutting in areas greater than 50 acres in size would not be consistent with the Biological and Conference Opinion (*USFWS, 1993; 1997*) issued by USFWS in accordance with the Endangered Species Act.

Use at Fort Ord or Other Sites and Under What Conditions

Remotely-operated mechanical vegetation clearance has not been used at the former Fort Ord and is still in research and development elsewhere. Initial field studies have been performed in grassy areas and their application in the vegetation found in CMC habitat is unknown.

Availability of Equipment and Personnel

Because remotely-operated mechanical vegetation clearance has not been used at the former Fort Ord and is still in research and development elsewhere, it would not be available for use at the IA sites under the stringent time constraints associated with a high priority OE Remedial Action.

Deposition of Vegetation

Vegetation that is cut, chipped or shredded would fall onto the ground, covering UXO and reducing visibility. Recovery of many rare, threatened, or endangered species could be inhibited by a thick layer of woody cuttings, thus inhibiting germination.

Visibility of Ground Surface

Safety procedures require the vegetation be cleared to bare ground or approximately 6 inches above ground surface to allow for proper operation of UXO detection equipment and prevent the accidental detonation of UXO on the surface. This level of clearance may be achievable using remotely-operated mechanical methods; however, the cuttings would generally fall to the ground where they could obscure or cover UXO.

Regrowth of Vegetation and Maintenance Requirements

Vegetation cleared by remotely-operated mechanical methods would not likely require additional cutting if each area has an OE Remedial Action immediately following vegetation clearance; however, standards for long term maintenance of mechanically cleared vegetation are not known and have not been established. Recovery of vegetation would be inhibited because the ground would be covered preventing germination of threatened or endangered species.

Level of Effort in Terms of Personnel

Remotely-operated mechanical clearance would require coordination of labor crews accompanied by UXO specialists and personnel trained in the use of this developmental type of equipment working with vegetation clearance workers at a rate of 2 acres per day per crew over a period of 40 weeks (10 months) for the 483 acres at Ranges 43-48, 28 weeks (7 months) for the 388 acres at Range 30A, and 6 weeks (1.5 months) for the 80 acres at Site OE-16.

A description of the types of remotely-operated mechanical equipment potentially available for vegetation clearance is presented below.

Mine Clearing Equipment

This group includes several machines that have been designed to trigger anti-personnel and/or antitank mines. OAO corporation has developed a Tele-operated Ordnance Disposal System (TODS) unit in collaboration with the US Army in their Humanitarian De-Mining Technology Development Program. It is a reconfigured Bobcat rubber-tired skid steer system that has been retrofitted with armor and GPS guidance control. It can accept vegetation cutting implements as well as backhoe buckets. Another development under this program is the Tempest, a relatively small (4 feet x 12 feet) robotic machine that has been used in Europe and Asia to clear vegetation and trip wires as a pre-cursor to more intensive manual clearance. The Tempest is rated as capable of clearing up to a 200-square-meter area of light vegetation; it can cut through a 10-cm diameter stem (about 4 inches) in three-to-four minutes.

Remotely-Operated Vegetation Clearance Machines

Several remotely-operated machines dedicated to vegetation clearance were identified. With retrofitting for remote operation, it may be possible to operate any mechanical vegetation clearance equipment without having personnel in the immediate area.

The All-Purpose Remote Transport System (ARTS) machine was used on the Balboa West Bombing and Gunnery Range (an Air Force installation in Panama) to clear vegetation, primarily thick, 10-foot tall Elephant grass. It allowed EOD personnel to clear UXO in its path. It is essentially a track carrier with a front end Brush Hog attachment that was able to travel at 7 to 8 miles per hour. It was designed by Vertak/ARA and 15 similar units are being built for use at other Air Force installations.

The Mechanically-Assisted Manual De-Mining System (MgM MaM-System) is a vegetation mulcher mounted on a 360-degree, 6-meter boom, on a vehicle hardened against explosives. It appears to operate on a principle similar to the TAZ, but is rubber-tire propelled.

The TAZ is similar in principle to the one described in the previous section. The difference is that because the machine is "sacrificial," most of the components are

recycled or reused. An operator can operate this equipment via radio control from up to 3,500 feet from the work location. This equipment is still under design.

A2.3 Prescribed Burning

Prescribed burning is the use of fire under a specific set of conditions to burn vegetation. Prescribed burning is used in a large number of plant communities in California to achieve a range of objectives. Most commonly, the objectives for which a prescription is developed are one or more of the following: fuel hazard reduction and control; range improvement; agricultural land clearing; commercial forest stand improvements; slash reduction or removal (tree cutting operations); and habitat maintenance or enhancement. Also considered are two pre-burn site preparation methods that could be used to optimize burn conditions and effectiveness by reducing the moisture content in vegetation before initiating a burn. Preparation methods that could be implemented prior to conducting a prescribed burn include Pre-Crushing (Mechanical Crushing) and Browning (Herbicide Application). Implementation of either of these methods would cause the vegetation to die off or wilt, which would reduce the moisture content and result in a more complete burn. These methods are described below and discussed as a preparatory component of Prescribed Burning in the following sections.

Prescribed Burning Preparation Methods

The extent to which woody material would be consumed by prescribed burning is directly related to fuel moisture and ambient conditions at the time of the burn:

- Under relatively cool, moist conditions, it is possible that very little woody material would be consumed
- Under relatively warm, low-humidity, low-fuel moisture conditions, the majority of woody vegetation up to 2 inches in diameter may be consumed.

Although the timing of prescribed burning can be targeted for low-fuel moisture conditions during seasonally dry periods, it is possible to extend the period during which these conditions are present by preparing the vegetation prior to burning to minimize the fuel moisture by one of the following methods:

1. Pre-Crushing (Mechanical Crushing)
2. Browning (Herbicide Application).

In both cases, the leaves and stems of the vegetation would be damaged and within a short period of time would become desiccated, thereby reducing the moisture of the fuel and the amount of smoke generated. In addition, conducting the prescribed burn on low moisture fuel would create a hotter burning fire, which would: (1) increase the height of the smoke convection column and dispersal of the smoke, (2) create a differential in moisture content between the burn area and surrounding areas, making escape into higher moisture areas less likely. For these reasons, herbicide application and pre-crushing will be considered as preparatory components of Prescribed Burning in the following sections.

The following parameters would be associated with conducting prescribed burning for purposes of vegetation clearance.

How the Method is Carried Out in the Field

Prescribed Burning Preparation Methods

The major elements of each of the preparation methods for purposes of lowering fuel moisture prior to prescribed burning include the following:

- Pre-Crushing (Mechanical Crushing)– Crushing vegetation via mechanical methods within the prescribed burn area as described for the mechanical clearance methods above in Section A2.2.2.
- Browning (Herbicide Application) – Aerial spraying of herbicides (via helicopter) over

the prescribed burn area as described for herbicide application below in Section A2.5.

The major elements of prescribed burning for purposes of vegetation clearance include the following:

- Preparation of a burn prescription/burn plan, outlining the objectives of the burn, the burn area, and the range of environmental conditions (temperature, humidity, wind speed/direction, fuel load, and fuel moisture) under which the burn will be conducted. The burn plan also describes the manpower and equipment resources required to ignite, manage, and contain the fire and establishes the communication procedures for the fire crew and to the public and other affected agencies.

- Site preparation, including establishment and maintenance of primary, secondary, and tertiary containment lines, staging areas, and escape routes.

- Conducting the burn within the window of environmental conditions established in the burn prescription.

- Follow-up operations to ensure the fire is fully contained and does not escape the perimeter of the burn area.

Worker Exposure to UXO

Worker exposure to UXO as it relates to Pre-Crushing and Browning preparation methods is described in Section A2.2 (Mechanical Vegetation Clearance Methods) and Section A2.5 (Herbicide Application), respectively. For Pre-Crushing, worker exposure to UXO would be somewhat less likely than for Mechanical Vegetation Clearance because the vegetation would be crushed rather than wholly removed, and would be left in place to dry and create fuel for burning rather than being removed by workers to expose UXO. For Browning, worker exposure would be the same as for Herbicide Application, because both methods would likely be conducted aerially (via helicopter) and would not expose workers to UXO.

Prescribed burning of vegetation would be conducted using aerial methods (e.g., via helicopter), which would isolate workers from direct exposure to UXO that is potentially present in areas being cleared. Although workers clearing vegetation in fuel break areas would potentially be exposed to UXO, their exposure would be limited to a small percentage of the total acreage at the IA sites. Although some ground crews would be present in fuel break areas and air sampling or meteorological stations that have that have been previously cleared of UXO, proper worker awareness, protective equipment and care would reduce worker exposure to injury.

Accidental Detonation of UXO

Accidental detonation of UXO as it relates to Pre-Crushing and Browning preparation methods is described in Section A2.2.2 (Mechanical Vegetation Clearance Methods) and Section A2.5 (Herbicide Application), respectively. In the case of accidental detonation of UXO during Pre-Crushing, workers would likely be exposed to flying fragments or blast debris depending on distance to, and the type and size of UXO. Accidental detonation of UXO would likely not expose the Herbicide Application worker to flying fragments or blast debris depending on distance to, and the type and size of UXO.

Prescribed burn workers are not likely to be exposed to flying fragments or blast debris depending on distance to, and the type and size of the UXO. In general, the possibility exists for any vegetation clearance method applied at the IA sites to detonate UXO. The burn would be conducted by personnel located outside the burn area containing UXO, which would minimize exposure. Mitigation of potential public exposure to flying fragments or blast debris from accidental detonation of UXO during vegetation clearance activities would be addressed in the site health and safety plan for individual areas. In addition, a community safety plan would be

provided to present information regarding accidental and intentional detonation of UXO. In general, potential public exposure would be prevented by: (1) conducting a pre-field analysis of the type, size and orientation of the UXO known or expected to be present in a given area and its proximity to the public,
(2) calculation of the maximum distance flying fragments or blast debris would travel based on the type and size of UXO, and
(3) implementation of mitigation measures if necessary to prevent public exposure.

Duration of the Vegetation Clearance Method

Durations of the Pre-Crushing and Browning preparation methods are described in Section A2.2.2 (Mechanical Vegetation Clearance Methods) and Section A2.5 (Herbicide Application), respectively. For Pre-Crushing, several months of preparation activities would be added to the duration of vegetation clearance of conducted prior to prescribed burning. For Browning, several days of preparation activities would be added to the duration of vegetation clearance of conducted prior to prescribed burning.

Vegetation clearance using prescribed burning would take approximately 1 week for each of the IA sites, including preparation and relocation (3 days) conducting the burn (2 days), and allowing the smoke to clear and continue air sampling and monitoring (2 days).

Air Emissions

Air emissions as they relate to Pre-Crushing and Browning preparation methods would be the same as described in Section A2.2.2 (Mechanical Vegetation Clearance Methods) and Section A2.5 (Herbicide Application), respectively. Air emissions from prescribed burning with pre-crushing may be somewhat less than from burning without pre-crushing, because pre-crushing would produce a drier fuel and hotter fire, which would typically generate fewer emissions. Air emissions from prescribed burning with browning may be somewhat less than from burning without browning, because browning would produce a drier fuel and hotter fire, which would typically generate fewer emissions. However, there is a potential for the herbicide applied to the area to be emitted during burning of the treated vegetation.

During prescribed burning, smoke would be generated for 2 days and residual smoke from burning may remain in the air for several days thereafter. However, prior public notification, smoke management while conducting the burn, and temporary relocation of individuals from areas affected by smoke to unaffected areas would minimize potential impacts of the emissions. Potential emissions from detonated UXO are expected to be insignificant and not of concern in terms of human health, the environment, and worker safety. The Army conducted an assessment of OE-related air emissions that may be associated with conducting a burn. The results are presented in the Technical Memorandum, Air Emissions from Incidental Ordnance Detonation During a Prescribed Burn on Ranges 43-48, Former Fort Ord (*Harding ESE, 2001*) (Air Emissions Technical Memorandum) prepared in cooperation with and under review by the regulatory agencies.

The intense fire associated with prescribed burn conditions may result in the detonation of surface or near-surface OE items. Detonation of OE has the potential to release air pollutants to the atmosphere. These air emissions may potentially include combustion products, volatile or semivolatile organic compounds, unburned or incompletely burned energetic material, and particulate metals and metal compounds from chemical components of the OE items. At issue is whether the type or quantity of air emissions from incidental detonation of OE in Ranges 43-48 from prescribed burning of vegetation (biomass) in the same area, or is significant in absolute magnitude.

A Technical Memorandum, Air Emissions from Incidental Ordnance Detonation During a Prescribed Burn on Ranges 43-48, Former Fort Ord (*Harding ESE, 2001*) (Air Emissions Technical Memorandum) was prepared to

(1) quantify a reasonable upper bound estimate of air emissions from incidental detonation of OE in Ranges 43-48, (2) compare those emissions with those expected from burning of biomass, and (3) compare screening level estimates of pollutant concentrations from OE to health-protective regulatory screening values. Data from this investigation may also be used to guide the development of an appropriate ambient air monitoring program to be implemented during a prescribed burn at Ranges 43-48 if such a prescribed burn is performed. The Air Emissions Technical Memorandum does not address the issue of possible human health effects from biomass burning.

The results of this investigation reveal that reasonable upper bound estimates of air emissions from incidental OE detonation for combustion products and volatile organic compounds are much less than 0.1 percent (i.e., one one-thousandth) of the corresponding emissions from biomass burning in Ranges 43-48. The only exception is for dioxin/furan toxicity equivalent emissions for which the reasonable upper bound OE contribution is about 1 percent (i.e., one one-hundredth) of that from biomass. Reasonable upper bound emissions of all particulate metals except Beryllium from incidental OE detonation are equal to or less than 10 percent (i.e., one-tenth) those from biomass burning. For all pollutants evaluated in this investigation, including Beryllium and those pollutants for which there are no corresponding biomass emissions for comparison, screening model estimates of pollutant concentrations are much less than health-protective regulatory screening values.

The conclusion of this investigation is that air pollutant emissions from incidental OE detonation during a prescribed burn in Ranges 43-48 will be minor compared to emissions contributed directly by biomass burning, and will result in pollutant concentrations well below health-protective regulatory screening levels.

Erosion

Erosion as it relates to Pre-Crushing and Browning preparation methods would be the same as described in Section A2.2.2 (Mechanical Vegetation Clearance Methods) and Section A2.5 (Herbicide Application), respectively. Pre-Crushing followed by prescribed burning would likely cause more erosion than prescribed burning alone due to the use of mechanical equipment. Erosion from Browning followed by prescribed burning would be the same as for prescribed burning alone because it would be applied aerially and would not disturb surface soils.

Vegetation clearance using prescribed burning may result in some surface disturbance or erosion on slopes in the short term, since fire reduces most of the vegetation to bare mineral soil. However, revegetation of burned areas is likely to proceed rapidly following the start of the next rain season, thus minimizing further erosion potential. In the long term, burning would have a beneficial impact on the health and growth of the plants and their stability.

Impacts to Protected and Other Natural Resources

Burning would have beneficial impacts on threatened, endangered, and native plants present at the IA sites in the long term because chaparral communities in California are adapted to periodic wildfires and the CMC habitat present at the IA sites has evolved to be dependent on fire for its health and functioning (Table 1 of the accompanying IA RI/FS). Vegetation that is cleared by burning not only recovers, but flourishes and provides a diversity and abundance of native plants. Plants and animals at the IA sites have survived, become dependent on, and adapted to a cycle of occasional fire that recycles nutrients and exposes mineral in the soil while stimulating the germination of seeds that accumulate in between fires. This natural succession allows the plant community to recover to pre-burn conditions and enhances the natural diversity of the unique habitat containing threatened and endangered

plants at the IA sites. The central maritime chaparral community that occurs at Fort Ord is similar to other California chaparral associations, having herbaceous and shrub plant species which are considered dependent on fire for reproduction. Reproductive strategies that relate to the occurrence of fire include the release of dormancy by heating (*Wright, 1931*); and the reduction or alteration of chemicals either on the seed coat or in the soil, which inhibit reproduction (*Muller 1966; Christensen and Muller, 1975*). Several of these plant species are either uncommon or endemic to the Monterey Peninsula, and are subject to management provisions of the HMP.

Preliminary observations made during monitoring of habitat recovery after vegetation clearance at Fort Ord (conducted under the HMP monitoring program) support burning as a favorable method for vegetation clearance for the following reasons:

- Seedlings of HMP shrubs were common in burned areas after clearance activities. A preliminary evaluation indicated HMP shrub regeneration occurred in densities over 3,000 seedlings per acre after burning (as compared to only 29 seedlings per acre occurred after cutting).

- Species diversity is generally higher in burned areas.

- A greater diversity of native herbaceous species were observed in burned areas.

In addition, because CMC habitat contains protected species at these sites, resource management measures are required by USFWS as detailed in the Biological and Conference Opinion, memoranda, and other correspondence between USFWS and the Army (*USFWS, 1993 - 2001*; *Army, 1998 - 2000*) and in accordance with the HMP (*USACE, 1997*). The intent of the USFWS is that "the Army would primarily use prescribed fire to clear vegetation in support of OE removal actions in areas designated as habitat reserves . . . to preserve, protect, and enhance populations and habitat of listed species and to protect candidate and sensitive species to the extent needed to preclude the need for future listings. Consequently, methods of vegetation clearance in maritime chaparral that do not involve burning are not consistent with the habitat and species preservation and protection goals of the HMP" (*USFWS, 2001*).

Pre-Crushing followed by prescribed burning would have beneficial impacts on threatened and endangered plants present at the IA sites, similar to that expected from prescribed burning alone as described in Section A2.3 (Prescribed Burning). Browning would have impacts on threatened and endangered plants present at the IA sites during herbicide application and after the subsequent prescribed burning because the herbicide cannot be applied selectively to non-threatened and non-endangered plants (Table 1 of the accompanying IA RI/FS) as discussed in Section A2.5 (Herbicide Application). If CMC vegetation is cleared by herbicide application, it likely will not grow back as diverse or as abundant and may result in converting CMC habitat to a more common habitat type.

Use at Fort Ord or Other Sites and Under What Conditions

Use at Fort Ord or other sites and under what conditions as it relates to Pre-Crushing and Browning preparation methods would be the same as described in Section A2.2.2 (Mechanical Vegetation Clearance Methods) and Section A2.5 (Herbicide Application), respectively. Although mechanical vegetation clearance methods have been used at Fort Ord, pre-crushing as a site preparation method for prescribed burning has not been used at Fort Ord. Browning as a site preparation method for prescribed burning has not been used at Fort Ord.

Prescribed burning has been used extensively at former Fort Ord for decades because of military training activities, and has also been used to clear CMC vegetation from OE sites similar to the IA sites to support removal actions at the former Fort Ord since 1994. Prescribed burns are conducted in close coordination with federal,

state and local regulatory agencies. Prescribed burns consist of using fire under optimal climatic conditions to clear vegetation from OE Sites, and is the primary vegetation clearance method for extensive use in designated HMP CMC habitat that exists at the IA sites.

Availability of Equipment and Personnel

Availability of equipment and personnel as it relates to Pre-Crushing and Browning preparation methods would be the same as described in Section A2.2.2 (Mechanical Vegetation Clearance Methods) and Section A2.5 (Herbicide Application), respectively.

Prescribed burning has been used extensively at the former Fort Ord and the equipment and personnel necessary to implement burning would be available for use at the IA sites under the stringent time constraints associated with Interim Action.

Deposition of Vegetation

Depending on the provisions of the burn prescription and the occurrence of suitable conditions, the burn would clear or consume the majority of top growth on shrubs, consume the leaf litter, and burn a portion of the standing woody stems. The extent to which woody material would be consumed is directly related to fuel moisture and ambient conditions at the time of the burn. Under relatively cool, moist conditions, very little woody material would be consumed. Under low-humidity, low-fuel moisture conditions, woody vegetation up to 2 inches in diameter may burn. Preparation methods could be used to extend the time period under which these conditions exist as described above.

For Pre-Crushing and Browning, the intent is to deposit the vegetation and let it dry to provide fuel for prescribed burning rather than to remove it to provide visibility of the ground surface as is intended with the vegetation clearance methods. Overall, use of these preparation methods followed by prescribed burning would result in consumption of vegetation similar to prescribed burning under low moisture content conditions.

Visibility of Ground Surface

Safety procedures require the vegetation be cleared to bare ground or approximately 6 inches above ground surface to allow for proper operation of UXO detection equipment and prevent the accidental detonation of UXO on the surface. This level of clearance would be achievable using burning. Fire clears the vegetation and leaves the range in a condition that typically provides OE workers a clear, unobstructed view of the ground surface.

Pre-Crushing and Browning preparation methods for prescribed burning would result in the same ground surface visibility that would be achieved by prescribed burning alone.

Regrowth of Vegetation and Maintenance Requirements

Prescribed burning would consume the majority of the vegetation; however, some additional cutting may be necessary in certain areas to achieve clearance to bare ground or approximately 6 inches above ground surface depending on the fire conditions. Such additional cutting may only occur after a surface clearance of UXO has been conducted. Protocols for the long term maintenance of burned areas have been established in the HMP and include 5 years of monitoring the recovery of the vegetation.

Similar conditions would be expected for Pre-Crushing followed by prescribed burning. Regrowth of vegetation and maintenance requirements as they relate to Browning preparation methods followed by prescribed burning would be as described in Section A2.5 (Herbicide Application).

Level of Effort in Terms of Personnel

Pre-Crushing and Browning activities would add to the level of effort in terms of personnel for prescribed burning as described below. For Pre-Crushing, the level of effort would be

somewhat less than for Mechanical Vegetation Clearance (Section A2.2.2) because the vegetation would be left in place to dry rather than being removed to improve visibility of the ground surface. For Browning, the level of effort would be the same as for Herbicide Application (Section A2.5).

Prior to the burn, Army personnel will coordinate relocation efforts and ensure the public is informed of the planned burn through a notice in a local newspaper, public meetings, and other avenues of communication as appropriate. . In addition, over several months time, vegetation and UXO clearance personnel would clear and maintain fuel breaks surrounding the burn area and forming a containment line. The breaks would be pre-treated immediately before conducting the burn with a fire suppressant foam (3 days). An air sampling and monitoring program would be developed and coordinated by several people and air monitoring stations would be set up. In addition, meteorological profiling would be conducted prior to and during the burn. Prescribed burning would be conducted using an operator to pilot the helicopter equipped with a torch to initiate the burn, and several people located at high elevations outside the burn area observing the burn's progress telescopically. A coordination crew of several people would also be involved in planning and monitoring the burn and assessing meteorological conditions and air samples would be collected and analyzed offsite. Fire suppressant crews would stand by during the burn and emergency fire crews from local jurisdictions would be on notice in case the fire traveled in an unplanned manner. After the burn was completed, air monitoring would continue until after the smoke had cleared (approximately 2 days) and the return of relocated residents would be coordinated.

A2.4 Animal Grazing

This method of vegetation clearance involves introduction of domestic browsing/grazing animals into the areas to be cleared of vegetation. Herbivory for vegetation management is most commonly undertaken with goats, but sheep, horses, and cattle have also been used. If herbivory were to be undertaken as an experimental or applied vegetation clearance method, it is assumed goats would be the most likely animal used. Goats have a broad range of tolerance for food plants and consume leaves and stems of many plant species that other browsers/grazers find unpalatable. Further, goats will clamber onto low branches or raise up on their hind legs to reach browse.

The following parameters would be associated with implementing animal grazing for purposes of vegetation clearance.

How the Method is Carried Out in the Field

The major elements of goat grazing include the following:

- Establishment of an electrically fenced perimeter for the area to be browsed.

Introduction of goats to the site involves transportation to the site and ordinarily requires the presence of one or more goatherders and dogs to manage the goats. Portable housing for the goatherders would also be required. For the purposes of this evaluation, a herd of 350 goats was assumed, although the number of goats introduced to a site varies, with literature review indicating the density ranges from 250 to 350 animals per acre in 1.5- to 2-acre fenced areas (*Stromberg, 1997*). The assumed herd sizes coincide with other successful animal grazing studies; areas of larger size would allow the goats to selectively graze and have not been shown to be effective in clearing vegetation. The goats remain in the area until they have consumed all of the palatable vegetation they can reach.

For the purposes of this evaluation, it was assumed the herd of 350 goats would clear 1.5 acres per day (*Stromberg, 1997*). The goats must be fenced in to a relatively small area to maintain constant browsing pressure on the standing vegetation. Otherwise, goats will tend to wander over a large area searching for the most palatable plant materials. Goats also

require attendance by goat herders and usually dogs to keep the animals from escaping and to move them around within the enclosure. Establishment of fencing and attendance by goat herders would require clearing a perimeter area of vegetation and a frequent or constant presence in OE areas. The enclosure is dismantled, a new fenced perimeter is established, and the goats are rotated out of the first enclosure into the next. This process is repeated until the goats have been rotated into all areas to be browsed. Water and supplemental feed would be provided.

If goats are successful in clearing a large portion of leafy vegetation, they will leave a stand of bare branches or broken stems. This may marginally improve visibility and mobility for OE workers but would not result in adequate clearance of vegetation for OE removals and the rate would be very slow. Reviewed studies indicate that up to 350 goats confined to a 1.5-acre area could clear a significant portion of the herbaceous and palatable shrubby vegetation over a two- to three-day period. This rate would translate to a period of four-to-six months to clear a 100-acre site, assuming that the rate of fence installation and other herd maintenance activities would not introduce delays.

Worker Exposure to UXO

Personnel involved in implementation of animal grazing would be limited to a crew of herders; however, these workers and the animals would have direct exposure to UXO that is present in areas being cleared, which may cause serious injury or death. Crews installing fences would also have potential direct exposure to UXO. Proper worker awareness, protective equipment and care could reduce worker exposure to injury. The type of UXO present at the IA sites is extremely sensitive and highly dangerous, and could potentially be suspended in the branches of the vegetation being cleared, where it could cause serious injury or death to workers.

Accidental Detonation of UXO

In the case of accidental detonation of UXO, goats, shepherds, herd dogs, and water and fence maintenance crews would be exposed to flying fragments or blast debris depending on distance to, and the type and size of the UXO. In general, the possibility exists for any vegetation clearance method applied at the IA sites to detonate UXO. Animal grazing has a high likelihood of causing serious injury or death of workers or animals. Mitigation of potential public exposure to flying fragments or blast debris from accidental detonation of UXO during vegetation clearance activities would be addressed in the site health and safety plan for individual areas. In addition, a community safety plan would be provided to present information regarding accidental and intentional detonation of UXO. In general, potential public exposure would be prevented by: (1) conducting a pre-field analysis of the type, size and orientation of the UXO known or expected to be present in a given area and its proximity to the public, (2) calculation of the maximum distance flying fragments or blast debris would travel based on the type and size of UXO, and (3) implementation of mitigation measures if necessary to prevent public exposure.

Duration of the Vegetation Clearance Method

Vegetation clearance using animal grazing (a herd of 350 goats at a rate of 1.5 acres per day) would take approximately 53 weeks (13 months) over the 483 acres at Ranges 43-48, approximately 37 weeks (9 months) over the 388 acres at Range 30A, and approximately 8 weeks (2 months) over the 80 acres at Site OE-16. Additional clearing using other methods would be required subsequent to grazing, which would increase the duration of these methods.

Air Emissions

Potential emissions from grazing or accidentally detonated UXO are believed to be insignificant with regards to impacts to human health, the environment and worker safety.

Erosion

Vegetation clearance using animal grazing may cause some surface disturbance or erosion in the short term due to the presence of 350 goats grazing and walking over the ground surface. Grazing of vegetation could also cause erosion in the long term because this method is likely to result in lower diversity and abundance of vegetation.

Impacts to Protected and Other Natural Resources

Animal grazing would have impacts on threatened and endangered plants present at the IA sites during and after implementation because the goats would not be selective in their foraging and would feed on threatened and endangered species (Table 1 of the accompanying IA RI/FS). If CMC vegetation is cleared by grazing, it likely will not grow back as diverse or as abundant and may result in converting CMC habitat to a more common habitat type. In addition, because CMC habitat contains protected species at these IA sites, resource management measures are required by USFWS as detailed in the Biological and Conference Opinion , memoranda, and other correspondence between USFWS and the Army (*USFWS, 1993- 2001*; *Army, 1998 through 2000*) and in accordance with the HMP (*USACE, 1997*). The intent of the USFWS is that "the Army would primarily use prescribed fire to clear vegetation in support of OE removal actions in areas designated as habitat reserves . . to preserve, protect, and enhance populations and habitat of listed species and to protect candidate and sensitive species to the extent needed to preclude the need for future listings. Consequently, methods of vegetation clearance in maritime chaparral that do not involve burning are not consistent with the habitat and species preservation and protection goals of the HMP" (*USFWS, 2001*).

Use at Fort Ord or Other Sites and Under What Conditions

Animal grazing has not been used at Fort Ord to clear vegetation specifically in support of OE Remedial Action. The Pebble Beach Company has successfully used goats to reduce vegetation in Monterey Pine Forests on the Monterey Peninsula to reduce the fuel loads and minimize wildfire hazards (*Stromberg, 1997*); however, these areas did not contain the threatened or endangered species present at the IA sites and grazing was conducted on a small scale compared with the total 951 acres (483 acres at Ranges 43-48, 388 acres at Range 30A, and 80 acres at Site OE-16) requiring vegetation clearance at the three IA sites.

Availability of Equipment and Personnel

The use of goats would require installation of temporary, movable electric fences to confine the goats to small parcels until the vegetation is sufficiently reduced. The electric fencing would be relocated each time the goats consumed the vegetation in a given parcel until the vegetation was sufficiently cleared. The approximate herd size would be 350 goats. Goat herders would be required to control herd movements. Additionally, water would need to be trucked into the site daily and portable generators would be required to supply power to the electric fence. Although the fencing and water supply equipment would be available, experienced goat herders and availability of such large herds may be difficult to procure. Fencing and a temporary water supply for the animals would be available, but would be somewhat difficult to install, move and maintain as the herd migrates due to the dense vegetation, rough terrain and presence of UXO.

Deposition of Vegetation

Goats would consume the vegetation they can reach and therefore, it would not be deposited on the ground surface. Goats will stand on their hind legs to reach into shrubs and will bend or break small branches to reach leaves, flowers, and fruits and will debark shrubs and trees to

consume the cambium layer, but would not clear the woody material.

Visibility of Ground Surface

Safety procedures require the vegetation be cleared to bare ground or approximately 6 inches above ground surface to allow for proper operation of UXO detection equipment and prevent the accidental detonation of UXO on the surface. This level of clearance would not be achievable using animal grazing. The goats tend to consume the most palatable vegetation first, proceeding to the next most palatable until they consume plant material in all strata of the vegetation they can reach. Although they will consume young, relatively tender stems of shrubs and trees, goats do not eat woody material; therefore, the vegetation would need to be cleared further by some other method to achieve an clearance to bare ground or approximately 6 inches above ground surface.

Regrowth of Vegetation and Maintenance Requirements

Animal grazing would not clear the majority of the vegetation; therefore, some additional cutting would be necessary to clear vegetation to bare ground or approximately 6 inches above ground surface. Standards for long term maintenance of grazed areas have not been established. High nitrogen release from animal excrement from a herd of 350 goats would act as a fertilizer to exotic and invasive plant species, which could increase their growth and competition with the growth and recovery of threatened or endangered CMC species.

Level of Effort in Terms of Personnel

Several goat herders would be required to control herd movements, and maintain an assumed herd size of 350 goats at a rate of clearance of 1.5 acres per day. The level of effort in terms of personnel would require goat herding and fencing crews to work full time for approximately 53 weeks (13 months) over the 483 acres at Ranges 43-48, approximately 37 weeks (9 months) over the 388 acres at Range 30A, and approximately 8 weeks (2 months) over the 80 acres at Site OE-16. Additional clearing using other methods would be required subsequent to grazing, which would increase the duration of these methods. In addition, water would need to be trucked to the herd location daily, portable generators would need to be maintained to supply power to the electric fence, and the mobile would have to be frequently relocated as the herd finishes grazing each area.

A2.5 Herbicide Application

A number of different chemical formulations of herbicides could be used to kill vegetation at the IA sites. A licensed applicator would need to be consulted to develop the appropriate mixture, application method, and application rate for the treatment areas. Only licensed applicators can apply herbicides on Department of Defense (DoD) property.

Herbicides have the effect of killing the standing vegetation. Products evaluated include:

- Arsenal® (imazapyr)
- Garlon® (triclopyr)
- Finale® (glufosinate-ammonium)
- RoundUp Pro® (glyphosate)
- Krenite® (fosamine-ammonium)
- Tordon® 101 (picloram, 2,4-D)
- Vanquish® (diglycolamine)
- Transline® (clopyralid)
- SpraKil® S-5 (tebuthioron).

All of the products reviewed appeared to have the capability to kill or defoliate standing vegetation. None of the products specifically listed any of the shrub species naturally occurring in CMC at Fort Ord, although plants found in other communities were listed. These products represent a subset of the products

available but are representative of the effects and effectiveness of a range of products. Temporary defoliants were not evaluated. These types of chemicals are primarily used in agriculture on annual plants such as cotton to cause leaf-drop prior to mechanical harvesting. Data on abscission-causing effects on perennial vegetation were not found. If effective, defoliants could cause the temporary (or permanent) loss of leaves from CMC or other types of shrubs. Although this could marginally improve visibility, it would not reduce the volume of standing woody material.

Of the products listed, glyphosate (RoundUp®) is among the most frequently used to control vegetation growth. Glyphosate is non-selective, killing any plants upon which it is applied. Glyphosate is prescribed for terrestrial applications and has a light petroleum distillate as a carrier. For aquatic applications, Rodeo® is used; it contains the same active ingredient with no petroleum carrier. Glyphosate is taken up by plants through the leaves and transported to the roots of plants where it interferes with production of root hairs. Root hairs occur at the very tips of actively growing roots and are the sites where moisture is taken up from the soil. Root hairs persist for only a few days, being constantly replaced at the growing tip. Loss of the ability to take up water from the soil causes the plant to wither. Treated plants may die within a few days or may persist for a few weeks. RoundUp® is considered generally non-toxic to animals. This herbicide binds to soil particles on contact, leaving no residual, active herbicide in the soil. Soil-bound glyphosate is broken down to harmless organic compounds by soil microflora.

The majority of products other than glyphosate have some residual soil activity. Some products kill on contact by chemically burning the leaves; others damage or clog plants' vascular systems, or damage meristematic (growing tips) regions of the plant. Some of the products (imazapyr, tebuthioron) indicate that they will control the re-emergence of plants in treated areas. Use of these products would alter the viability of seeds in the soil following treatment.

A range of herbicides would likely be effective in killing top growth of CMC and other types of vegetation. However, none of these products would break down or clear the standing, dead, woody portions of the plants. Consequently, either mechanical methods or prescribed fire would be required to clear the standing dead material prior to OE removal activities. A second disadvantage is that herbicides would likely kill most or all of the burl-forming shrubs. These shrubs re-sprout quickly after fire or other disturbance and quickly provide ground cover. In general, burl-formers tend to reproduce less frequently from seed that obligate seed-reproducers. Killing all of the standing shrub species would have the effect of setting the community back in terms of the successional process in that all plants would have to return from germinating seedlings. It would likely take many years for the community to return to a species composition that approximates the conditions prior to treatment. The extended period of recovery may render the CMC community vulnerable to invasion by exotic weeds or by coast live oak.

The use of herbicides in CMC would not be effective in reducing vegetation prior to OE removal. The use of herbicides is technically implementable by ground-based or aerial spraying. Administratively, the landscape-level use of herbicides would make this method difficult to implement because it would require extensive coordination with regulatory agencies to address potential air quality effects and to address potential impacts to the structure of CMC and management requirements provided for in the HMP.

The following parameters would be associated with implementing herbicide application for purposes of vegetation clearance.

How the Method is Carried Out in the Field

The method of herbicide application would depend on several factors including the size of the area, topography, accessibility, and the type of product used. Aerial application would be most efficient for treating large sites.

Truck-mounted sprayers could be used in areas with adequate roads or trails. "Back pack" sprayers could be used for small areas.

Worker Exposure to UXO

Herbicide application would be conducted using aerial methods (e.g., via helicopter), which would isolate workers from direct exposure to UXO that is potentially present in areas being cleared. Although some ground crews would be present at air sampling or meteorological stations that have been previously cleared of UXO, proper worker awareness, protective equipment and care would reduce worker exposure to injury.

Accidental Detonation of UXO

In the case of accidental detonation of UXO, herbicide application workers are not likely to be exposed to flying fragments or blast debris depending on distance to, and the type and size of the UXO. In general, the possibility exists for any vegetation clearance method applied at the IA sites to detonate UXO. Herbicide application would be conducted by personnel located in aircraft above the area containing UXO, which would minimize exposure. Mitigation of potential public exposure to flying fragments or blast debris from accidental detonation of UXO during vegetation clearance activities would be addressed in the site health and safety plan for individual areas. In addition, a community safety plan would be provided to present information regarding accidental and intentional detonation of UXO. In general, potential public exposure would be prevented by: (1) conducting a pre-field analysis of the type, size and orientation of the UXO known or expected to be present in a given area and its proximity to the public, (2) calculation of the maximum distance flying fragments or blast debris would travel based on the type and size of UXO, and (3) implementation of mitigation measures if necessary to prevent public exposure.

Duration of the Vegetation Clearance Method

Vegetation clearance at each of the IA sites using herbicide application would take approximately 1 week including 3 days preparation and relocation, 2 days to aerially apply the herbicide, and 2 days to allow the herbicides to clear from the air and continue air sampling and monitoring. Additional clearing using other methods would be required subsequent to herbicide application. Herbicides work through a variety of chemical pathways depending on the target plant species and the intended effects. Herbicide effects range from suppression of growth for a short period to essentially sterilized soil that will prevent growth of any plants for up to several years.

Air Emissions

Potential emissions from herbicide application that may drift into non-target areas is an issue for any spray method, particularly for aerial application. During herbicide application, airborne herbicides would be generated for several days and may remain in the air for several days thereafter. However, prior public notification, management of airborne herbicides while conducting the application, and temporary relocation of individuals from areas affected by herbicides to unaffected areas would minimize potential impacts of the emissions. In addition, depending on the product used, if fire is subsequently required to clear the vegetation more effectively after herbicide application, workers could be exposed to herbicide residues generated during the fire. Potential emissions from accidentally detonated UXO are believed to be insignificant with regards to impacts to human health, the environment and worker safety.

Erosion

Vegetation clearance using herbicide application would not be likely to cause surface disturbance or erosion in the short term because herbicides would be applied aerially. Herbicide application could cause erosion in the long term because this

method is likely to result in lower diversity and abundance of vegetation.

Impacts to Protected and Other Natural Resources

Herbicide application would have impacts on threatened and endangered plants present at the IA sites during and after implementation because it cannot be applied selectively to non-threatened or endangered plants and species (Table 1 of the accompanying IA RI/FS). If CMC vegetation is cleared by herbicide application, it likely will not grow back as diverse or as abundant and may result in converting CMC habitat to a more common habitat type. In addition, because CMC habitat contains protected species at these IA sites, resource management measures are required by USFWS as detailed in the Biological and Conference Opinion, memoranda, and other correspondence between USFWS and the Army (*USFWS, 1993 through 2001*; *Army, 1998 through 2000*) and in accordance with the HMP (*USACE, 1997*). The intent of the USFWS is that "the Army would primarily use prescribed fire to clear vegetation in support of OE removal actions in areas designated as habitat reserves . . to preserve, protect, and enhance populations and habitat of listed species and to protect candidate and sensitive species to the extent needed to preclude the need for future listings . . Consequently, methods of vegetation clearance in maritime chaparral that do not involve burning are not consistent with the habitat and species preservation and protection goals of the HMP" (*USFWS, 2001*).

Use at Fort Ord or Other Sites and Under What Conditions

Herbicides have not been used for vegetation clearance in preparation for OE Remedial Action at Fort Ord, and specifically has not been used to support OE Remedial Action within CMC habitat areas containing threatened and endangered species found at the IA sites. The Bureau of Land Management (BLM) has used herbicides (RoundUp™) at the former Fort Ord to control Pampas grass and iceplant at several locations. California Department of Parks and Recreation (CDPR) is treating iceplant on the former beach train fire ranges on an ongoing basis.

Availability of Equipment and Personnel

Equipment used in herbicide application and during planning, relocation and air sampling activities would be available.

Deposition of Vegetation

Although herbicide application may kill the targeted vegetation, it would not be removed, and the dense shrub canopy would persist in a leafless condition. The effect of the herbicide would be to kill the entire plant or at least the above-ground portions. Woody vegetation would not be consumed. Leaves would turn brown and drop from the plant over time in most cases, and would serve to "carpet" the understory of the shrubs, obscuring visual identification of surface UXO.

Visibility of Ground Surface

Safety procedures require the vegetation be cleared to bare ground or approximately 6 inches above ground surface to allow for proper operation of UXO detection equipment and prevent the accidental detonation of UXO on the surface. This level of clearance would not be achievable using herbicide application. Removal of leaves may somewhat improve ground visibility; however, the rapid drop of leaves would serve to "carpet" the understory of the shrubs, potentially obscuring UXO.

Regrowth of Vegetation and Maintenance Requirements

Vegetation cleared by herbicide application would not consume the majority of the vegetation; therefore, some additional clearance methods would be necessary to achieve clearance to bare ground or approximately 6 inches above ground surface. Standards for long term maintenance of vegetation where herbicides have been applied have not been established.

Level of Effort in Terms of Personnel

Application of herbicides over the IA sites could be achieved by personnel operating the aircraft and conducting the spraying working full time for a period of approximately one week. Coordination with the public and regulatory agencies, relocation of residential citizens concerned about exposure to herbicides, and air sampling and monitoring would be conducted by a team of people.

A3.0 SCREENING OF VEGETATION CLEARANCE METHODS

This section presents the Screening of vegetation clearance methods based on general and site-specific parameters described in Section A2.0. Table A1 presents a summary of the Screening of these methods. Prior to developing and evaluating vegetation clearance alternatives for the IA sites, the methods identified in Section A2.0 were screened for: (1) their ability to achieve the Vegetation Clearance Objective (Section 1.1) of clearing vegetation to bare ground or approximately 6 inches above ground surface, and (2) a preliminary evaluation of its effectiveness, implementability and relative cost. The methods that did not meet the screening criteria were eliminated from further consideration prior to performing the detailed analysis of alternatives in the accompanying IA RI/FS.

A3.1 Description of Evaluation Criteria

The evaluation criteria categorized in terms of effectiveness, implementability and cost used to screen the vegetation clearance methods and alternatives are described below.

A3.1.1 Screening of Vegetation Clearance Methods

Safety procedures require vegetation be cleared to bare ground or approximately 6 inches above ground surface so that it is safe for UXO specialists to enter areas requiring OE Remedial Actions to mitigate a threat to public safety by improving visual identification of UXO on the ground surface prior to conducting the OE Remedial Action. Therefore, if the method does not meet this screening criteria, it is not evaluated further in this Evaluation. Historical data from previous vegetation clearance activities at Fort Ord and manufacturer specifications for various types of clearing equipment would be considered and compared to this requirement. In addition, a preliminary evaluation of general and site-specific parameters (Section A2.0) and each method's effectiveness, implementability and relative cost were considered in the screening.

After the screening, the methods that met the screening criteria and were retained for further consideration are further evaluated based on their effectiveness, implementability and cost in Section A3.3. The evaluation criteria are described below.

A3.1.2 Effectiveness

The effectiveness of each alternative during the implementation and operation phases is assessed. Factors considered included the protection of the community and workers during vegetation clearance operations, the time required to implement the alternative and to achieve the vegetation clearance objectives, and the potential adverse environmental impacts that may result. The reliability and proven history of the alternative would also be evaluated with respect to the vegetation and site-specific conditions found at the sites. Specifically, the effectiveness of the alternative will be further evaluated based on the degree to which it can achieve: (1) Clearance of Vegetation to Bare Ground or Approximately 6 Inches Above Ground Surface, and be (2) Protective of Human Health, (3) Protective of Workers During Implementation, (4) Protective of the Environment, and (5) Compliance with the substantive elements of Applicable or Relevant and Appropriate Requirements (ARARs), as described in the following sections.

A3.1.2.1 Protection of Human Health

Factors such as noise, dust, emissions, calculating safety zone distances in case UXO is detonated, and the need for site security during

implementation would be considered and compared to this requirement.

A3.1.2.2 Protection of Workers During Implementation

Safety factors such as the potential degree of worker contact with UXO for each of the vegetation clearance methods and the ability to mitigate risks to workers would be considered and compared to this requirement.

A3.1.2.3 Protection of the Environment

Factors such as the direct and indirect effects on flora and fauna during implementation would be considered and compared to this requirement.

A3.1.2.4 Compliance with ARARs

Factors such as coordinating with regulatory agencies and complying with the substantive elements of permitting processes to the extent practicable associated with implementing each method would be considered. The types of ARARs and To-Be-Considered Requirements that will be evaluated will include action-, location-, and chemical-specific requirements as well as To-Be-Considered requirements.

A3.1.3 Implementability

The implementability of applying a given alternative is based on its technical and administrative feasibility and availability of services and materials as described below. Technical feasibility considerations include the ability to procure and operate the equipment and monitor the effectiveness of vegetation clearance alternatives that will satisfy the time constraints of conducting a high priority OE Remedial Action. Administrative feasibility includes coordinating with regulatory agencies and complying with the substantive elements of permitting processes to the extent practicable. The availability of contractors with the equipment and knowledge to implement the vegetation clearance alternatives is also assessed.

A3.1.3.1 Technical Feasibility

The technical capabilities of each vegetation clearance method and its applicability to site conditions would be considered, such as the equipment's specifications regarding the type and amount of vegetation that could be cut, predicted production rates, and the effects of varying topography and soil conditions. Technical feasibility considerations include the ability to procure and operate the equipment and monitor the effectiveness of vegetation clearance alternatives that will satisfy the time constraints of conducting a high priority OE Remedial Action. Administrative feasibility includes coordinating with regulatory agencies and complying with the substantive elements of permitting processes to the extent practicable. In addition, its prior use under similar conditions, whether it is a proven method, and any anticipated operational difficulties, the frequency and complexity of equipment maintenance, field QA/QC and calibration, and the need for materials and technical staff would be considered. The demonstrated performance and useful life of the equipment or system and its adaptability to variable environmental conditions such as type of vegetation, terrain, and climate and any impacts the alternative may have on future actions and how long it would take to mobilize and implement it in the field would be considered.

A3.1.3.2 Administrative Feasibility

The ability to comply with the substantive elements of permitting processes to the extent practicable and secure approvals for each method would be considered. The effort and resources required to coordinate with regulatory agencies and comply with the substantive elements of permitting processes to the extent practicable and the degree to which the alternative is anticipated to be effective in

rendering the IA sites suitable for safe OE Remedial Action would be considered.

A3.1.3.3 Availability of Services and Materials

The availability of tools, equipment and labor as well as the ability to maintain equipment during implementation associated with each method would be considered. The availability of contractors with the equipment and knowledge to implement the vegetation clearance alternatives and the ease of acquiring necessary equipment, labor, materials or specialists would be considered. The need for management and/or disposal of cleared vegetation and the ease of maintaining the level of clearance for the duration of the OE Remedial Action would be considered.

A3.1.4 Cost

Capital and operations and maintenance (O&M) costs associated with implementing each of the methods were estimated based on historical data from previous clearance activities at Fort Ord and contractor and vendor quotes. Costs include contractor's mobilization and demobilization, labor, engineering, equipment purchase or lease and construction/installation, ongoing equipment operation and inspections, utilities, routine maintenance and repairs, etc. There are no O&M costs associated with maintaining cleared areas during OE Remedial Actions assuming OE workers would move immediately into cleared areas. Long term O&M costs for monitoring the recovery of the habitat for a period of 5 years as specified in the HMP are assumed to be the same for each of the methods. These cost estimates do not include the cost to implement corrective measures such as active plantings and additional monitoring and reporting if the HMP success criteria are not met. The costs to repair damages caused to the CMC habitat areas would likely be significant if methods other than prescribed burning (the only vegetation clearance method approved for use in CMC habitat areas at the IA sites) are implemented.

A3.2 Screening of Vegetation Clearance Methods

Table A1 presents the Screening of each method in achieving the Vegetation Clearance Objective (Section A1.0) of clearing vegetation to bare ground or approximately 6 inches above ground surface. In addition, a preliminary evaluation of each method's effectiveness, implementability and relative cost was considered in the screening.

The following summary of the screening indicates whether the method was retained for further consideration based on the preliminary evaluation and consideration of the site-specific parameters described in Section A2.0.

A3.2.1 No Action

Taking no action to clear vegetation is not viable for the IA sites because vegetation must be cleared to bare ground or approximately 6 inches above ground surface in order to conduct OE Remedial Action that presents an unacceptable risk to human health.

No Action is eliminated from further consideration.

A3.2.2 Manual, Mechanical and Remotely-Operated Mechanical Vegetation Clearance

Based on previous experience implementing these methods at Fort Ord to clear vegetation prior to UXO sampling or removal actions, manual, mechanical and remotely-operated mechanical vegetation clearance methods (cutting) could be effective under certain circumstances at the IA sites, and are implementable with a medium to high cost compared to other methods depending on the cutting method used. Cutting costs range from medium to high compared to the other methods. Mechanical methods are 23 percent lower than burning, 80 percent higher than grazing, and

57 percent higher than herbicide application. Manual methods are 300 percent higher than burning, 46 percent higher than grazing, and 91 percent higher than herbicide application. Costs for remotely-operated mechanical methods cannot be estimated at this time because units are still in development and are not commercially available; these costs are anticipated to be approximately 30 to 50 percent higher than for mechanical methods.

Capital and O&M costs for cutting are estimated as follows for the IA sites:

Ranges 43-48

Costs are estimated at $5,713 per acre for manual methods and $3,350 per acre for mechanical methods. Costs for remotely-operated mechanical methods cannot be estimated at this time because units are still in development and are not commercially available; these costs are anticipated to be approximately 30 to 50 percent higher than for mechanical methods. Long term O&M costs for monitoring the recovery of the habitat for a period of 5 years as specified in the HMP would be approximately $213,000 for each of the methods.

Range 30A

Capital costs are estimated at $5,481 per acre for manual methods and $3,178 per acre for mechanical methods. Costs for remotely-operated mechanical methods cannot be estimated at this time because units are still in development and are not commercially available; these costs are anticipated to be approximately 30 to 50 percent higher than for mechanical methods. Long term O&M costs for monitoring the recovery of the habitat for a period of 5 years as specified in the HMP would be approximately $149,000 for manual or mechanical methods.

Site OE-16

Capital costs are estimated at $5,516 per acre for manual methods and $3,220 per acre for mechanical methods. Costs for remotely-operated mechanical methods cannot be estimated at this time because units are still in development and are not commercially available; these costs are anticipated to be approximately 30 to 50 percent higher than for mechanical methods. Long term O&M costs for monitoring the recovery of the habitat for a period of 5 years as specified in the HMP would be approximately $30,000 for manual or mechanical methods.

There would be no O&M costs to maintain cleared vegetation during the course of the OE Remedial Action assuming OE workers moved immediately into each area as it was cleared. These cost estimates do not include the cost to implement corrective measures such as active plantings and additional monitoring and reporting if the HMP success criteria are not met. The costs to repair damages caused to the CMC habitat areas would likely be significant if methods other than prescribed burning are used.

Cutting has a production rate of only 2 to 2.5 acres per day depending on the cutting method used; at these rates, it would take 32 to 40 weeks (8 to 10 months) to clear Ranges 43-48, 22 to 28 weeks (5.5 months to 7 months) to clear Range 30A, and 5 to 6 weeks (1.25 to 1.5 months) to clear Site OE-16. These methods would not comply with the HMP and ESA and could only be applied on a limited basis because implementation of cutting in areas greater than 50 acres in size would not be consistent with the Biological and Conference Opinion (*USFWS, 1993; 1997*) issued by USFWS in accordance with the Endangered Species Act. In addition, cutting would not be selective in its impacts on plants and would clear threatened and endangered species, which would not comply with the HMP and ESA. However, because they are valid, standard methods for clearing vegetation (although remotely-operated equipment is still in development) and could be effective in clearing vegetation at the IA sites notwithstanding the limitations described above, they are retained for further consideration as a basis of comparison to other methods.

Remotely-Operated Mechanical Vegetation Clearance methods were eliminated from this analysis because this type of equipment is very specialized, is still in development, is extremely costly, and is not available for commercial use at this time.

Manual and Mechanical Vegetation Clearance are retained for further consideration; Remotely-Operated Mechanical Vegetation Clearance is eliminated from further consideration.

A3.2.3 Prescribed Burning

Preparation methods that could be implemented prior to conducting a prescribed burn include Pre-Crushing (Mechanical Crushing) and Browning (Herbicide Application). Implementation of either of these methods would cause the vegetation to die off or wilt, which would reduce the moisture content and result in a more complete burn. Pre-Crushing uses Mechanical Vegetation Clearance methods and would be effective as described above in Section A2.2.2; however, prescribed burning alone would be effective in clearing vegetation to bare ground or approximately six inches above ground surface, and can be implemented in one week, as compared to Pre-Crushing, which would take many months to implement at significantly higher cost (Table A1). Costs for Pre-Crushing would be approximately $3,151 per acre, which would be in addition to per acre costs for prescribed burning of $3,972, in effect doubling the cost of vegetation removal. Therefore, Pre-Crushing is eliminated from further consideration as a preparation method for prescribed burning. Browning using Herbicide Application could not be implemented because the herbicide could not be applied selectively and would defoliate or kill threatened and endangered species, which would not comply with the HMP and ESA. Therefore, Browning is eliminated from further consideration as a preparation method for prescribed burning.

Based on previous experience implementing prescribed burning at Fort Ord to clear vegetation prior to UXO sampling or removal actions, it would be effective in clearing vegetation to bare ground or approximately 6 inches above ground surface, can be implemented in one week, which would coincide with the intention of clearing vegetation as soon as possible under Interim Action. Burning has medium capital costs compared to other methods (20 percent more than mechanical methods, 70 percent less than manual methods, 83 percent more than grazing, and 33 percent more than herbicide application).

Capital and O&M costs for burning are estimated as follows for the IA sites:

Ranges 43-48

Capital costs are $3,972 per acre for burning. Long term O&M costs for monitoring the recovery of the habitat for a period of 5 years as specified in the HMP would be approximately $213,000.

Range 30A

Capital costs are $3,906 per acre for burning. Long term O&M costs for monitoring the recovery of the habitat for a period of 5 years as specified in the HMP would be approximately $149,000.

Site OE-16

Capital costs are $3,973 per acre for burning. Long term O&M costs for monitoring the recovery of the habitat for a period of 5 years as specified in the HMP would be approximately $30,000.

Capital costs include those associated with planning and conducting the burn, and air monitoring and sampling as well as community relations and costs associated with relocation of community members during the burn. There are no O&M costs associated with maintaining cleared areas during OE Remedial Actions assuming OE workers would move immediately into cleared areas. These cost estimates do not include the cost to implement corrective measures such as active plantings and additional

monitoring and reporting if the HMP success criteria are not met.

Prescribed Burning is retained for further consideration. Preparation of vegetation to reduce fuel moisture and improve and extend ideal burning conditions using Pre-Crushing (Mechanical Clearance Methods) and Browning (Herbicide Application) is eliminated from further consideration.

A3.2.4 Animal Grazing

Based on previous experience implementing animal grazing at other sites to clear grassland vegetation where UXO is not present, it would not be effective in clearing woody vegetation to bare ground or approximately 6 inches above ground surface in UXO areas; therefore an additional method would need to be implemented to clear the vegetation completely. Grazing has low estimated capital (Table A1 costs compared to other methods (83 percent less than burning, 80 percent less than mechanical methods, 95 percent less than manual methods, and 84 percent less than herbicide application). However, an additional clearance method would be required as described above; therefore, actual costs would be more.

Cost estimates are as follows for grazing at the IA sites:

Ranges 43-48

Capital costs are estimated at $650 per acre for grazing. Long term O&M costs for monitoring the recovery of the habitat for a period of 5 years as specified in the HMP would be approximately $213,000.

Range 30A

Capital costs are estimated at $650 per acre for grazing. Long term O&M costs for monitoring the recovery of the habitat for a period of 5 years as specified in the HMP would be approximately $149,000.

Site OE-16

Capital costs are estimated at $650 per acre for grazing. Long term O&M costs for monitoring the recovery of the habitat for a period of 5 years as specified in the HMP would be approximately $30,000.

There are no O&M costs associated with maintaining cleared areas during OE Remedial Actions assuming OE workers would move immediately into cleared areas. These cost estimates do not include the cost to implement corrective measures such as active plantings and additional monitoring and reporting if the HMP success criteria are not met. The costs to repair damages caused to the CMC habitat areas would be significantly higher than if methods other than prescribed burning are used.

Grazing could not be implemented because the goats are not selective in their feeding and would consume threatened and endangered species, which would not comply with the HMP and ESA. In addition, grazing has a production rate of only 1.5 acres per day for a herd of 350 goats (*Stromberg, 1997*); at this rate, it would take approximately 1 year (53 weeks) to clear Ranges 43-48, 37 weeks to clear Range 30A, and 8 weeks to clear Site OE-16. In addition, the goats would not eat all of the vegetation; therefore, this type of clearance would need to be followed by additional vegetation clearance.

Animal Grazing is eliminated from further consideration.

A3.2.5 Herbicide Application

Based on previous experience implementing herbicide application at other sites to clear weeds and other non-CMC type vegetation, it would be not be effective in clearing vegetation to bare ground or approximately 6 inches above ground surface; therefore an additional method would need to be implemented to clear the vegetation completely. In addition, it could not be implemented because it would not be selective in its impacts on plants and would

consume threatened and endangered species, which would not comply with the HMP and ESA. Although herbicide application would only take 1 week to implement, it would require additional vegetation clearance. Herbicide application has medium estimated capital costs (Table A1) compared to other methods (67 percent less than burning, 63 percent less than mechanical methods, 91 percent less than manual methods, and 84 percent more than grazing). However, an additional clearance method would be required as described above; therefore, actual costs would be more.

Capital and O&M costs for herbicide application are estimated as follows for the IA sites:

Ranges 43-48

Capital costs are $1,196 per acre for herbicide application. Long term O&M costs for monitoring the recovery of the habitat for a period of 5 years as specified in the HMP would be approximately $213,000.

Range 30A

Capital costs are $1,196 per acre for herbicide application. Long term O&M costs for monitoring the recovery of the habitat for a period of 5 years as specified in the HMP would be approximately $149,000.

Site OE-16

Capital costs are $1,196 per acre for herbicide application. Long term O&M costs for monitoring the recovery of the habitat for a period of 5 years as specified in the HMP would be approximately $30,000.

There are no O&M costs associated with maintaining cleared areas during OE Remedial Actions assuming OE workers would move immediately into cleared areas. These cost estimates do not include the cost to implement corrective measures such as active plantings and additional monitoring and reporting if the HMP success criteria are not met. The costs to repair damages caused to the CMC habitat areas would be significantly higher if methods other than prescribed burning are used. Herbicide application could not be implemented because the herbicide could not be applied selectively and would defoliate or kill threatened and endangered species, which would not comply with the HMP and ESA.

Herbicide Application is eliminated from further consideration.

A3.2.6 Summary of the Screening of Vegetation Clearance Methods

Based on the screening that (1) evaluated whether each method described in Section A2.0 met the minimum requirement of clearing vegetation to bare ground or approximately 6 inches above ground surface, and (2) a preliminary evaluation of effectiveness, implementability and cost, the following methods met the requirement and were retained for further consideration and analysis in the accompanying IA RI/FS:

- **Manual Vegetation Clearance**
- **Mechanical Vegetation Clearance**
- **Prescribed Burning.**

A4.0 REFERENCES

Christensen, N., and C. Muller, 1975. *Relative Importance of Factors Controlling Germination and Seedling Survival in* Adenostoma *Chaparral*. American Midland Naturalist. 93: 71-78.

Harding ESE, Inc. (Harding ESE, formerly Harding Lawson Associates [HLA]), 2001. *Technical Memorandum, Air Emissions from Incidental Ordnance Detonation During a Prescribed Burn on Ranges 43 through 48, Former Fort Ord, Monterey, California*. November 9.

Muller, C., 1966. *The Role of Chemical Inhibition (Allelopathy) in Vegetational Composition.* Bulletin of the Torrey Botanical Club. 93: 332-351.

Stromberg, Mark R., 1997. *Rationale for Short-Duration Grazing of Pebble Beach/Forest Foundation Open Space Lands for Reduction of Poison, Oak, Weeds and Fuels*.

U.S. Army Corps of Engineers (USACE) Sacramento District, 1997. *Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California*. With technical assistance from Jones and Stokes Associates, Sacramento, California. April.

U.S. Department of the Army (Army), 1998. *Correspondence from Mr. Willison, Director, Environmental and Natural Resources Management, Department of the Army, Defense Language Institute and Presidio of Monterey, Presidio of Monterey County, California, to USFWS.* February 2.

_____, 1999. *Final Action Memorandum, Phase 2 Engineering Evaluation / Cost Analysis, Ordnance and Explosives Sites, Former Fort Ord, Monterey County, California.* June 28.

_____, 2000. *Correspondence from Mr. Willison, Director, Environmental and Natural Resources Management, Department of the Army, Defense Language Institute and Presidio of Monterey, Presidio of Monterey County, California, to USFWS.* November 6, December 21.

U.S. Department of the Interior, Fish and Wildlife Service (USFWS), 1993. *Biological Opinion for the Disposal and Reuse of Fort Ord, Monterey County, California*. (I-8-93-F-14). October 19.

_____, 1997. *Biological and Conference Opinion for the Disposal and Reuse of Fort Ord, Monterey County, California*.

_____, 1997. *Controlled Burning Program at the Former Fort Ord, Monterey County, California*. October 9.

_____, 1998. *Proposed Changes in Ordnance and Explosives Removal at the Former Fort Ord, Monterey County, California*. March 16.

_____, 1999. *Biological and Conference Opinion on the Closure and Reuse of Fort Ord, Monterey County, California*. (I-8-99-F/C-39R). March 30.

_____, 2000. *Biological and Conference Opinion on the Closure and Reuse of Fort Ord, Monterey County, California*. (I-8-99-F/C-39R). September 29.

_____, 2001. *Correspondence to Mr. Willison, Director, Environmental and Natural Resources Management, Department of the Army, Defense Language Institute and Presidio of Monterey, Presidio of Monterey County, California*. January 31.

Wright, E., 1931. *The Effect of High Temperature on Seed Germination.* Journal of Forestry. 29: 679-687.

APPENDIX A

TABLES

Table A1. Summary of Screening of Vegetation Clearance Methods
Screening Evaluation of Vegetation Clearance Method
Interim Action Remedial Investigation/Feasibility Study
Former Fort Ord, California

Vegetation Clearance Method	Evaluation Criteria		
	Effectiveness	**Implementability**	**Relative Cost**
No Action	No Action is considered as a baseline against which to compare other methods but would not be effective for these ranges and would not comply with ARARs since it takes no action to clear vegetation at the Ranges which have been assigned the highest priority for an OE Remedial Action. Vegetation must be cleared prior to conducting OE Remedial Action. Taking no action to clear vegetation and enhance visual identification of UXO on the surface prior to OE Remedial Actions would present unacceptable OE-related risks to workers and the public.	Implementable because no action would be taken to clear the vegetation. However, not implementable from a technical or administrative perspective because the vegetation would not be cleared and surface UXO that may be high explosive and have sensitive fuzing could not be safely removed.	There are no capital or O&M costs associated with No Action.
Manual, Mechanical, and Remotely-Operated Mechanical Vegetation Clearance (Cutting)	Manual and mechanical methods of clearing vegetation (cutting) would only be effective on a limited basis for areas under 50 acres at these ranges where burning could not be conducted. Cutting vegetation at the Ranges would not comply with the substantive requirements of ARARs such as the HMP and ESA. Although the vegetation could be cut using a variety of manual and mechanical methods and equipment (difficulty would depend on the thickness of the vegetation), OE workers require vegetation be cleared to bare ground or approximately 6 inches above ground surface, which could only be achieved over a period	Cutting could not be implemented at the Ranges regardless of the method used. Because threatened and endangered species exist at Fort Ord, the HMP was developed to comply with the Endangered Species Act (ESA) to mitigate impacts to species and their habitat associated with cleanup and OE Remedial Action. As a result, prescribed burning is the primary vegetation clearance method approved for use in CMC habitat areas found at the Ranges. Therefore, although manual and mechanical methods of cutting have been used extensively in areas designated for future development at Fort Ord and on a limited basis in CMC habitat areas of less than 50 acres where burning could not be conducted, cutting on a widespread basis over the 483, 388, and 80 acre IA sites would not comply with the HMP and ESA. Cutting would also be difficult to implement	Capital costs for cutting vegetation would be high for manual methods ($5,481 to $5,713 per acre) compared to prescribed burning ($3, 906 to $3,973 per acre) and mechanical ($3,178 to $3,350 per acre). Costs for remotely-operated mechanical methods cannot be estimated at this time because units are still in development and are not commercially available; these costs are anticipated to be approximately 30 to 50 percent higher than

Table A1. Summary of Screening of Vegetation Clearance Methods
Screening Evaluation of Vegetation Clearance Method
Interim Action Remedial Investigation/Feasibility Study
Former Fort Ord, California

Vegetation Clearance Method	Evaluation Criteria		
	Effectiveness	**Implementability**	**Relative Cost**
	of many months for the IA sites. In addition, the cuttings typically fall to the ground where UXO would potentially be present, and would then need to be chipped/removed in order to see UXO on the ground surface and perform the OE Remedial Action. Restoration of habitat in areas exposed to cutting would likely be extensive and in the long term it would be difficult and costly to restore these areas to their pre-existing condition.	because regardless of the method used, it would take many months to clear the IA sites. In addition, vegetation clearance personnel would be required to work in areas where there is a potential for exposure to UXO and serious injury or death. Remotely-operated equipment is still in development and is not available.	for mechanical methods. There would be no O&M costs to maintain cleared vegetation during the course of the OE Remedial Action if OE workers moved immediately into each area as it was cleared. There would be long term O&M costs of $213,000 for Ranges 43-48, $149,000 for Range 30A, and $30,000 for Site OE-16 associated with monitoring the recovery of CMC habitat for a period of 5 years as specified in the HMP. These cost estimates do not include the cost to implement corrective measures such as active plantings and additional monitoring and reporting if the HMP success criteria are not met. The costs to repair damages caused to the CMC habitat areas would be significantly higher if methods other than prescribed burning are used.
Prescribed Burning	Prescribed burning would be the most effective means of clearing vegetation because fire clears the vegetation and typically provides OE workers with a clear, unobstructed view of the ground surface, which would typically meet the requirement of clearing to bare	Prescribed burning would be implementable because it has been used to clear CMC vegetation from OE sites to support OE removal actions at the former Fort Ord since 1994, complies with the HMP and ESA, and would only take approximately 1 week to implement (3 days preparation & relocation, 2 days to conduct the burn, and 2 days for smoke to clear), which would coincide with	Capital costs associated with implementing a prescribed burn would be high ($3,906 to $3,973 per acre) compared to grazing and herbicides, low compared to manual

Table A1. Summary of Screening of Vegetation Clearance Methods
Screening Evaluation of Vegetation Clearance Method
Interim Action Remedial Investigation/Feasibility Study
Former Fort Ord, California

Vegetation Clearance Method	Evaluation Criteria		
	Effectiveness	**Implementability**	**Relative Cost**
	ground or approximately 6 inches above ground surface and would comply with the substantive requirements of ARARs to the extent practicable. In addition, personnel would not need to enter the area containing UXO until the vegetation was cleared. Prescribed burning is the primary vegetation clearance method approved for extensive use in the designated HMP CMC habitat areas that exist at Ranges 43-48. Burning improves the long term health and functioning of the plant community and threatened and endangered species which thrive on occasional fires and provide habitat for animals. The need for restoration of habitat in areas that are burned would be minimal in the long term because these areas thrive on fire and would eventually be restored to their pre-existing condition.	the intention of clearing vegetation as soon as possible to prepare the Ranges for conducting a high priority OE Remedial Action. Prescribed burns must be conducted under optimal climatic conditions and in close coordination with federal, state and local regulatory agencies. Recently, there has been some public concern regarding burn-related issues at Fort Ord such as air quality and fire safety. The Army is conducting ongoing work to mitigate these concerns, and will offer relocation to community members for the duration of the burn. In addition, prescribed burning personnel would not be required to work in areas where there is a potential for direct exposure to UXO and serious injury or death.	methods, and similar to mechanical methods, and would include conducting the burn, community relations, air monitoring and sampling and relocation of community members for the duration of the burn. There would be no O&M costs to maintain cleared vegetation during the course of the OE Remedial Action. There would be long term O&M costs of $213,000 for Ranges 43-48, $149,000 for Range 30A, and $30,000 for Site OE-16 associated with monitoring the recovery of CMC habitat for a period of 5 years as specified in the HMP. These cost estimates do not include the cost to implement corrective measures such as active plantings and additional monitoring and reporting if the HMP success criteria are not met.
Preparation Methods for Prescribed Burning	***Pre-Crushing*** Pre-Crushing using Mechanical Vegetation Clearance methods would be effective in preparing the vegetation for prescribed burning by damaging or removing leaves and stems that would then be allowed to dry out, providing a low moisture	***Pre-Crushing*** Pre-Crushing using Mechanical Vegetation Clearance methods would be difficult to implement on a wide scale at the Ranges (483 acres) because of the difficult terrain and services and equipment required. Pre-Crushing could be conducted in compliance with the HMP and ESA because it would be followed by burning; however, it would	***Pre-Crushing*** Capital costs for Pre-Crushing would be high ($3,151). There would be no O&M costs associated with preparation of vegetation because it would be followed by

Table A1. Summary of Screening of Vegetation Clearance Methods
Screening Evaluation of Vegetation Clearance Method
Interim Action Remedial Investigation/Feasibility Study
Former Fort Ord, California

Vegetation Clearance Method	Evaluation Criteria		
	Effectiveness	**Implementability**	**Relative Cost**
	fuel to optimize subsequent burning. ***Browning*** Browning using Herbicide Application methods would be effective in preparing the vegetation for prescribed burning by damaging leaves and stems that would then be allowed to dry out, providing a low moisture fuel to optimize subsequent burning.	require additional coordination with USFWS. ***Browning*** Browning using Herbicide Application methods could not be implemented because the herbicide could not be applied selectively and would defoliate or kill threatened and endangered species, which would not comply with the HMP and ESA. In addition, herbicide application followed by prescribed burning may release herbicide residues as air emissions during burning.	burning. ***Browning*** Capital costs for Browning would be moderate ($1,196 per acre). There would be no O&M costs associated with preparation of vegetation because it would be followed by burning.
Animal Grazing	Grazing would not be effective because it is used primarily to thin out vegetation and not clear it completely and would not comply with the HMP and ESA and the substantive requirements of ARARs. A significant portion of the vegetation (e.g., the woody parts that would not be eaten by goats) would remain, and the requirement that vegetation be cleared to bare ground or approximately 6 inches above ground surface would not be met. The need for restoration of habitat in areas exposed to grazing would likely be extensive and in the long term it would be difficult and costly to restore these areas to their pre-existing condition.	Animal grazing could not be implemented because it would not comply with the HMP and ESA and the goat herders and goats would be exposed to the sensitive and extremely hazardous type of UXO present at these ranges. Grazing has not been used at the former Fort Ord to clear vegetation from suspected or known OE Sites, and the use of goats would require management by a herder, and installation of temporary, movable electric fences and a water supply. The rate of grazing and vegetation thinning is 1.5 acres/day for a large herd of 350 goats; therefore, OE workers would only be able to access small portions of the IA sites incrementally. In addition, animals and personnel would be required to work in areas where there is a potential for direct exposure to UXO and serious injury or death.	Capital costs associated with grazing animals would be low ($650 per acre) compared to other methods; however, costs may increase substantially depending on the need to conduct additional vegetation clearance. There would be no O&M costs to maintain cleared vegetation during the course of the OE Remedial Action if OE workers moved immediately into each area as it was cleared. There would be long term O&M costs of $213,000 for Ranges 43-48, $149,000 for Range 30A, and $30,000 for Site OE-16 associated with monitoring the recovery of CMC habitat for a period of 5 years as specified in the HMP. These cost

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Screening Evaluation of Vegetation Clearance Method
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Former Fort Ord, California

Vegetation Clearance Method	Evaluation Criteria		
	Effectiveness	**Implementability**	**Relative Cost**
			estimates do not include the cost to implement corrective measures such as active plantings and additional monitoring and reporting if the HMP success criteria are not met. The costs to repair damages caused to the CMC habitat areas would be significantly higher if methods other than prescribed burning are used.
Herbicide Application	Herbicide application would not be effective because although it would eventually kill the vegetation, it would mainly cause the leaves to fall to the ground, potentially obscuring visual evidence of UXO and would not comply with the HMP and ESA and substantive requirements of ARARs. Since only the leaves would be cleared, the requirement that vegetation be cleared to bare ground or approximately 6 inches above ground surface may not be met unless additional methods of vegetation clearance were subsequently performed. In addition, the type of herbicides that would be effective for the different types of vegetation at the ranges may vary and the time it would take after application for the plants to die would be difficult to determine. The need for restoration of habitat in areas exposed to herbicides would likely be extensive and in the long term	Herbicide application could not be implemented because it would not comply with the HMP and ESA and the public and other species at the Ranges would be exposed to potentially harmful herbicides. Herbicide application has not been used at the former Fort Ord to clear vegetation from suspected or known OE Sites, and would require aerial application because the herbicides could not be safely applied using ground application methods due to the presence of UXO. Widespread application of herbicides over the 483, 388, and 80 acre IA sites would likely cause public concern, and DOD is encouraging a reduction in herbicide use at military installations. The application would need to be conducted in close coordination with federal, state and local regulatory agencies and in accordance with DOD herbicide guidance on its safe use, mixing, handling and application. In addition, although the rate of herbicide application over the entire 483 acres of the Ranges is estimated at 1 day, it would take approximately 1 week to include coordination with public, agencies, relocation and air sampling, etc. Additional vegetation clearance measures may have to be implemented to further clear brush because the herbicide would mainly defoliate	Capital costs associated with applying herbicides would be low ($1,196 per acre) compared to other methods and would include aerial application of herbicides, community relations, air monitoring and sampling and relocation of community members for the duration of the application. Costs may increase substantially depending on the need to conduct additional vegetation clearance. There would be no O&M costs to maintain cleared vegetation during the course of the OE Remedial Action if OE workers moved immediately into each area as it

Table A1. Summary of Screening of Vegetation Clearance Methods
Screening Evaluation of Vegetation Clearance Method
Interim Action Remedial Investigation/Feasibility Study
Former Fort Ord, California

Vegetation Clearance Method	Evaluation Criteria		
	Effectiveness	**Implementability**	**Relative Cost**
	it would be difficult and costly to restore these areas to their pre-existing condition.	the plants, leaving plant debris on the ground surface and woody stems in tact. Additional clearing using other methods could take up to 40 weeks, which would not coincide with the intention of clearing vegetation as soon as possible to prepare the Ranges for conducting a high priority OE Remedial Action. Herbicide application personnel would not be required to work in areas where there is a potential for exposure to UXO.	was cleared. There would be long term O&M costs of $213,000 for Ranges 43-48, $149,000 for Range 30A, and $30,000 for Site OE-16 associated with monitoring the recovery of CMC habitat for a period of 5 years as specified in the HMP. These cost estimates do not include the cost to implement corrective measures such as active plantings and additional monitoring and reporting if the HMP success criteria are not met. The costs to repair damages caused to the CMC habitat areas would be significantly higher if methods other than prescribed burning are used.

Notes:

ARARs	Applicable or Relevant and Appropriate Requirements
CMC	Central Maritime Chaparral
DOD	Department of Defense
ESA	Endangered Species Act
HMP	Habitat Management Plan
OE	Ordnance and Explosives
O&M Costs:	Operations & Maintenance Costs
UXO	Unexploded Ordnance

APPENDIX B

SCREENING EVALUATION OF OE REMEDIAL ACTION DEPTHS

APPENDIX B

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Interim Action OE RI/FS, Fort Ord, California

Depth of Removal	Screening Criteria						
	Effectiveness				Implementability		Interim Action Cost*
	Overall Protection of Human Health & Environment	Compliance with ARARs	Short Term Effectiveness	Long Term Effectiveness & Permanence	Administrative	Technical	
Surface OE Removal (Identify and Remove All OE on the Surface)	Eliminates immediate threat to trespassers & attractive nuisance on ground surface. BLM & development area reuse restrictions on digging required.	Complies	Effective in short term combined with existing access deterrents such as fencing, patrols, warning signs; however, site is in close proximity to public and trespassing incidents have been documented. Vegetation clearance and surface OE removal would provide unobstructed view, easier access to interior of IA site by trespassers, increased attractive nuisance, and potential for erosion to cause subsurface OE items to surface.	Highly likely to require remobilization & deeper removal in long term at significant additional cost. Depends on reuse and cleanup goals established in OE RI/FS. Need to determine if surface removal adjacent to development areas provides adequate risk reduction.	Necessary approval for Interim Action can be obtained. May be difficult to obtain approval as final remedy based on initial input from regulatory agencies and public. HMP requires vegetation recovery of 10 or more years after clearance and OE removal before remobilization could be implemented.	Personnel and equipment readily available. After clearing vegetation, time frame to complete surface removal is 10 months.	Vegetation Clearance $1.9 million OE Removal $5.8 million Enhanced Site Security (5 years) $4.5 million OE Detonation $0.5 million **Total Cost** **$12.7 million**

Table B1. Screening of OE Removal Depths ? Ranges 43-48
Interim Action OE RI/FS, Fort Ord, California

Depth of Removal	Screening Criteria						
	Effectiveness				Implementability		Interim Action Cost*
	Overall Protection of Human Health & Environment	Compliance with ARARs	Short Term Effectiveness	Long Term Effectiveness & Permanence	Administrative	Technical	
Subsurface OE Removal (Identify, Investigate, and Remove All Anomalies to Depths Consistent with Planned Reuse in Each Area)	Eliminates immediate threat to trespassers & provides safety margin for expanded reuse.	Complies	Effective in short term combined with existing access deterrents such as fencing, patrols, warning signs.	May require remobilization & deeper removal in long term at significant additional cost. Depends on reuse and cleanup goals established in OE RI/FS.	Necessary approvals can be obtained. May be difficult to obtain approval as final remedy based on initial input from regulatory agencies and public. HMP requires vegetation recovery of 10 or more years after clearance and OE removal before remobilization could be implemented.	Personnel and equipment readily available. After clearing vegetation, time frame to complete subsurface removal is 24 months.	Vegetation Clearance $1.9 million OE Removal* $10.6 to $11.2 million Existing Site Security (5 years) $0.2 million OE Detonation $1.1 million **Total** **$13.8 to $14.4 million**

Table B1. Screening of OE Removal Depths ? Ranges 43-48
Interim Action OE RI/FS, Fort Ord, California

Depth of Removal	Screening Criteria						
	Effectiveness				Implementability		Interim Action Cost*
	Overall Protection of Human Health & Environment	Compliance with ARARs	Short Term Effectiveness	Long Term Effectiveness & Permanence	Administrative	Technical	
OE Removal to Depth (Identify, Investigate, and Remove All Anomalies to Depth Found)	Eliminates immediate threat to trespassers & eliminates hazard to the maximum extent.	Complies	Effective in short term combined with existing access deterrents such as fencing, patrols, warning signs.	Likely effective as long term/permanent remedy. Depends on reuse and cleanup goals established in OE RI/FS.	Necessary approvals can be obtained. Likely able to obtain approval as final remedy based on initial input from regulatory agencies and public.	Personnel and equipment readily available. After clearing vegetation, time frame to complete removal to depth is 25 months.	Vegetation Clearance $1.9 million OE Removal $11.2 million Existing Site Security (5 years) $0.2 million OE Detonation $1.1 million **Total Cost $14.4 million**

* Vegetation Clearance, OE Remedial Action and OE Detonation costs are based on USACE and OE contractor estimated costs provided by Parsons, Inc. Estimated costs for Vegetation Clearance assume prescribed burning will be selected as the preferred alternative. Subsurface OE removal costs are estimated as a range of OE removal costs for a 1 ft. and 4 ft. removal. Estimated costs for OE Detonation assume Detonation with Engineering Controls will be selected as the preferred alternative.

Abbreviations

ARARs Applicable or relevant and appropriate requirements
OE Ordnance and Explosives
HMP Habitat Management Plan
OE RI/FS Ordnance and Explosives Remedial Investigation Feasibility Study for Fort Ord
UXO Unexploded Ordnance

Table B2. Screening of OE Removal Depths ? Range 30A
Interim Action OE RI/FS, Fort Ord, California

Depth of Removal	Screening Criteria						
	Effectiveness				Implementability		Interim Action Cost*
	Overall Protection of Human Health & Environment	Compliance with ARARs	Short Term Effectiveness	Long Term Effectiveness & Permanence	Administrative	Technical	
Surface OE Removal (Identify and Remove All OE on the Surface)	Eliminates immediate threat to trespassers & attractive nuisance on ground surface. BLM & development area reuse restrictions on digging required.	Complies	Effective in short term combined with existing access deterrents such as fencing, patrols, warning signs; however, site is in close proximity to public and trespassing incidents have been documented. Vegetation clearance and surface OE removal would provide unobstructed view, easier access to interior of IA site by trespassers, increased attractive nuisance, and potential for erosion to cause subsurface OE items to surface.	Highly likely to require remobilization & deeper removal in long term at significant additional cost. Depends on reuse and cleanup goals established in OE RI/FS. Need to determine if surface removal adjacent to development areas provides adequate risk reduction.	Necessary approval for Interim Action can be obtained. May be difficult to obtain approval as final remedy based on initial input from regulatory agencies and public. HMP requires vegetation recovery of 10 or more years after clearance and OE removal before remobilization could be implemented.	Personnel and equipment readily available. After clearing vegetation, time frame to complete surface removal is 8 months.	Vegetation Clearance $1.5 million OE Removal $4.4 million Enhanced Site Security (5 years) $4.2 million OE Detonation $0.06 million **Total Cost** **$10.2 million**

Table B2. Screening of OE Removal Depths ? Range 30A
Interim Action OE RI/FS, Fort Ord, California

Depth of Removal	Screening Criteria						
	Effectiveness				Implementability		Interim Action Cost*
	Overall Protection of Human Health & Environment	Compliance with ARARs	Short Term Effectiveness	Long Term Effectiveness & Permanence	Administrative	Technical	
Subsurface OE Removal (Identify, Investigate, and Remove All Anomalies to Depths Consistent with Planned Reuse in Each Area)	Eliminates immediate threat to trespassers & provides safety margin for expanded reuse.	Complies	Effective in short term combined with existing access deterrents such as fencing, patrols, warning signs.	May require remobilization & deeper removal in long term at significant additional cost. Depends on reuse and cleanup goals established in OE RI/FS.	Necessary approvals can be obtained. May be difficult to obtain approval as final remedy based on initial input from regulatory agencies and public. HMP requires vegetation recovery of 10 or more years after clearance and OE removal before remobilization could be implemented.	Personnel and equipment readily available. After clearing vegetation, time frame to complete subsurface removal is 19 months.	Vegetation Clearance $1.5 million OE Removal* $6.8 to $7.7 million Existing Site Security (5 years) $0.2 million OE Detonation $0.12 million **Total** **$8.5 to $9.5 million**

Table B2. Screening of OE Removal Depths ? Range 30A
Interim Action OE RI/FS, Fort Ord, California

Depth of Removal	Screening Criteria						
	Effectiveness				Implementability		Interim Action Cost*
	Overall Protection of Human Health & Environment	Compliance with ARARs	Short Term Effectiveness	Long Term Effectiveness & Permanence	Administrative	Technical	
OE Removal to Depth (Identify, Investigate, and Remove All Anomalies to Depth Found)	Eliminates immediate threat to trespassers & eliminates hazard to the maximum extent.	Complies	Effective in short term combined with existing access deterrents such as fencing, patrols, warning signs.	Likely effective as long term/permanent remedy. Depends on reuse and cleanup goals established in OE RI/FS.	Necessary approvals can be obtained. Likely able to obtain approval as final remedy based on initial input from regulatory agencies and public.	Personnel and equipment readily available. After clearing vegetation, time frame to complete removal to depth is 20 months.	Vegetation Clearance $1.5 million OE Removal $7.7 million Existing Site Security (5 years) $0.2 million OE Detonation $0.12 million **Total Cost** **$9.5 million**

* Vegetation Clearance, OE Remedial Action and OE Detonation costs are based on USACE and OE contractor estimated costs provided by Parsons, Inc. Estimated costs for Vegetation Clearance assume prescribed burning will be selected as the preferred alternative. Subsurface OE removal costs are estimated as a range of OE removal costs for a 1 ft. and 4 ft. removal. Estimated costs for OE Detonation assume Detonation with Engineering Controls will be selected as the preferred alternative.

Abbreviations

ARARs Applicable or relevant and appropriate requirements
OE Ordnance and Explosives
HMP Habitat Management Plan
OE RI/FS Ordnance and Explosives Remedial Investigation Feasibility Study for Fort Ord
UXO Unexploded Ordnance

Table B3. Screening of OE Removal Depths ? Site OE-16
Interim Action OE RI/FS, Fort Ord, California

Depth of Removal	Screening Criteria						
	Effectiveness				Implementability		Interim Action Cost*
	Overall Protection of Human Health & Environment	Compliance with ARARs	Short Term Effectiveness	Long Term Effectiveness & Permanence	Administrative	Technical	
Surface OE Removal (Identify and Remove All OE on the Surface)	Eliminates immediate threat to trespassers & attractive nuisance on ground surface. BLM & development area reuse restrictions on digging required.	Complies	Effective in short term combined with existing access deterrents such as fencing, patrols, warning signs; however, site is in close proximity to public and trespassing incidents have been documented. Vegetation clearance and surface OE removal would provide unobstructed view, easier access to interior of IA site by trespassers, increased attractive nuisance, and potential for erosion to cause subsurface OE items to surface.	Highly likely to require remobilization & deeper removal in long term at significant additional cost. Depends on reuse and cleanup goals established in OE RI/FS. Need to determine if surface removal adjacent to development areas provides adequate risk reduction.	Necessary approval for Interim Action can be obtained. May be difficult to obtain approval as final remedy based on initial input from regulatory agencies and public. HMP requires vegetation recovery of 10 or more years after clearance and OE removal before remobilization could be implemented.	Personnel and equipment readily available. After clearing vegetation, time frame to complete surface removal is 2 months.	Vegetation Clearance $0.3 million OE Removal $0.9 million Enhanced Site Security (5 years) $1.8 million OE Detonation $6,500 **Total Cost** **$3.0 million**

Table B3. Screening of OE Removal Depths ? Site OE-16
Interim Action OE RI/FS, Fort Ord, California

Depth of Removal	Screening Criteria						
	Effectiveness				Implementability		Interim Action Cost*
	Overall Protection of Human Health & Environment	Compliance with ARARs	Short Term Effectiveness	Long Term Effectiveness & Permanence	Administrative	Technical	
Subsurface OE Removal (Identify, Investigate, and Remove All Anomalies to Depths Consistent with Planned Reuse in Each Area)	Eliminates immediate threat to trespassers & provides safety margin for expanded reuse.	Complies	Effective in short term combined with existing access deterrents such as fencing, patrols, warning signs.	May require remobilization & deeper removal in long term at significant additional cost. Depends on reuse and cleanup goals established in OE RI/FS.	Necessary approvals can be obtained. May be difficult to obtain approval as final remedy based on initial input from regulatory agencies and public. HMP requires vegetation recovery of 10 or more years after clearance and OE removal before remobilization could be implemented.	Personnel and equipment readily available. After clearing vegetation, time frame to complete subsurface removal is 4 months.	Vegetation Clearance $0.3 million OE Removal* $1.29 to $1.3 million Existing Site Security (5 years) $0.04 million OE Detonation $13,000 **Total** **$1.62 to $1.65 million**

Table B3. Screening of OE Removal Depths – Site OE-16
Interim Action OE RI/FS, Fort Ord, California

Depth of Removal	Screening Criteria						
	Effectiveness				Implementability		Interim Action Cost*
	Overall Protection of Human Health & Environment	Compliance with ARARs	Short Term Effectiveness	Long Term Effectiveness & Permanence	Administrative	Technical	
OE Removal to Depth (Identify, Investigate, and Remove All Anomalies to Depth Found)	Eliminates immediate threat to trespassers & eliminates hazard to the maximum extent.	Complies	Effective in short term combined with existing access deterrents such as fencing, patrols, warning signs.	Likely effective as long term/permanent remedy. Depends on reuse and cleanup goals established in OE RI/FS.	Necessary approvals can be obtained. Likely able to obtain approval as final remedy based on initial input from regulatory agencies and public.	Personnel and equipment readily available. After clearing vegetation, time frame to complete removal to depth is 4 months.	Vegetation Clearance $0.3 million OE Removal $1.3 million Existing Site Security (5 years) $0.04 million OE Detonation $13,000 **Total Cost** **$1.65 million**

***** Vegetation Clearance, OE Remedial Action and OE Detonation costs are based on USACE and OE contractor estimated costs provided by Parsons, Inc. Estimated costs for Vegetation Clearance assume prescribed burning will be selected as the preferred alternative. Subsurface OE removal costs are estimated as a range of OE removal costs for a 1 ft. and 4 ft. removal. Estimated costs for OE Detonation assume Detonation with Engineering Controls will be selected as the preferred alternative.

Abbreviations

ARARs Applicable or relevant and appropriate requirements
OE Ordnance and Explosives
HMP Habitat Management Plan
OE RI/FS Ordnance and Explosives Remedial Investigation Feasibility Study for Fort Ord
UXO Unexploded Ordnance

APPENDIX C

INTERIM ACTION REMEDIAL ALTERNATIVE COST ESTIMATES

APPENDIX C

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COST ESTIMATES
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Table C1. Vegetation Clearance Cost Estimate
Prescribed Burning Alternative
Ranges 43-48
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
CAPITAL COSTS [1]				
Planning, Tech Support, Meteorological Profiling, Set-Up	483	acres	$535	$258,405
Install Primary Fuelbreak	483	acres	$310	$149,730
Conduct Prescribed Burn	483	acres	$1,250	$603,750
Community Relations	483	acres	$360	$173,880
Residential Relocation	483	acres	$180	$86,940
Air Sampling & Monitoring	483	acres	$450	$217,350
Security	4	weeks	$15,000	$60,000
Subtotal Capital Costs				$1,550,055
Capital Cost Contingency	10%	of Capital Costs		$155,006
Total Capital Costs				**$1,705,061**
ANNUAL O&M COSTS				
HMP Species Recovery Monitoring	1	lump sum	$50,000	$50,000
Total Annual Costs				**$50,000**
Assume 5 years of O&M				
Annual O&M NPV, 5 years, 6.4% ENR Cost Index for Construction, January 2002				$208,346
Annual Cost Contingency	10%	of annual costs		$5,000
Total 5 Year O&M NPV Cost				**$213,346**
TOTAL ALTERNATIVE COST, 5 YEARS				**$1,918,406**
TOTAL COST PER ACRE (483 ACRES)				**$3,972**

DEFINITIONS

ENR = Engineering News Record
NPV = Net Present Value
O&M = Operations & Maintenance

ASSUMPTIONS

These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

Table C2. Vegetation Clearance Cost Estimate
Mechanical Clearance Alternative
Ranges 43-48
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
CAPITAL COSTS [1]				
Mechanical Cutting & Chipping (2 passes/double cut method)	483	acres	$1,150	$555,450
Site Restoration	483	acres	$500	$241,500
Security	32	weeks	$15,000	$480,000
Subtotal Capital Costs				$1,276,950
Capital Cost Contingency	10%	of Capital Costs		$127,695
Total Capital Costs				**$1,404,645**
ANNUAL O&M COSTS				
HMP Species Recovery Monitoring [2]	1	lump sum	$50,000	$50,000
Total Annual Costs				**$50,000**
Assume 5 years of O&M				
Annual O&M NPV, 5 years, 6.4% ENR Cost Index for Construction, January, 2002				$208,346
Annual Cost Contingency	10%	of annual costs		$5,000
Total 5 Year O&M NPV Cost				**$213,346**
TOTAL ALTERNATIVE COST, 5 YEARS				**$1,617,991**
TOTAL COST PER ACRE (483 ACRES)				**$3,350**

DEFINITIONS
ENR = Engineering News Record
HMP = Habitat Management Plan
NPV = Net Present Value
O&M = Operations & Maintenance

ASSUMPTIONS
These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

[1] Costs based on recent Fort Ord specific data provided by USACE and Parsons, Inc.

[2] Actual HMP Species Recovery Monitoring O&M costs would be significantly higher for Mechanical Methods than for Prescribed Burning, the only method approved for use in CMC habitat areas greater than 50 acres.

Table C3. Vegetation Clearance Cost Estimate
Manual Clearance Alternative
Ranges 43-48
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
CAPITAL COSTS [1]				
Manual Cutting	483	acres	$2,400	$1,159,200
Hauling & Chipping	483	acres	$650	$313,950
Site Restoration	483	acres	$500	$241,500
Security	40	weeks	$15,000	$600,000
Subtotal Capital Costs				$2,314,650
Capital Cost Contingency	10%	of Capital Costs		$231,465
Total Capital Costs				**$2,546,115**
ANNUAL O&M COSTS				
HMP Species Recovery Monitoring [2]	1	lump sum	$50,000	$50,000
Total Annual Costs				**$50,000**
Assume 5 years of O&M				
Annual O&M NPV, 5 years, 6.4% ENR Cost Index for Construction, January, 2002				$208,346
Annual Cost Contingency	10%	of annual costs		$5,000
Total 5 Year O&M NPV Cost				**$213,346**
TOTAL ALTERNATIVE COST, 5 YEARS				**$2,759,461**
TOTAL COST PER ACRE (483 ACRES)				**$5,713**

DEFINITIONS

ENR = Engineering News Record
HMP = Habitat Management Plan
NPV = Net Present Value
O&M = Operations & Maintenance

ASSUMPTIONS

These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

[1] Costs based on recent Fort Ord specific data provided by USACE and Parsons, Inc.

[2] Actual HMP Species Recovery Monitoring O&M costs would be significantly higher for Manual Methods than for Prescribed Burning, the only method approved for use in CMC habitat areas greater than 50 acres.

Table C4. OE Remedial Action Cost Estimate
No Action w/ Existing Site Security Measures Alternative
Ranges 43-48
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
ANNUAL O&M COSTS [1]				
Existing Fence & Sign Maintenance/Repair	1	lump sum	$5,000	$5,000
Site Security Patrols	1	lump sum	$50,000	$50,000
Total Annual Costs				**$55,000**
Assume 5 years of O&M				
Annual O&M NPV, 5 years, 6.4% ENR Cost Index for Construction, January, 2002				$229,181
Annual Cost Contingency	10%	of annual costs		$5,500
Total 5 Year O&M NPV Cost				**$234,681**
TOTAL ALTERNATIVE COST, 5 YEARS				**$234,681**
TOTAL COST PER ACRE (483 ACRES)				**$486**

DEFINITIONS

EPA = U.S. Environmental Protection Agency
ENR = Engineering News Record
NPV = Net Present Value
O&M = Operations & Maintenance

ASSUMPTIONS

These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

[1] Costs based on recent Fort Ord specific data provided by USACE and Parsons, Inc.

Table C5. OE Remedial Action Cost Estimate
Enhanced Site Security Measures Alternative
Ranges 43-48
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
CAPITAL COSTS [1]				
Survey Perimeter/Site Preparation/Mobe/Demobe	1	lump sum	$10,000	$10,000
Install 10-ft. Chain Link w/Concertina Wire (2 crews)	19,108	feet	$40	$764,320
OE Escorts (2)	60	days	$1,400	$84,000
Post Warning Signs Every 100 ft.	200	signs	$10	$2,000
Post Large Warning Signs at Access Gates	5	signs	$200	$1,000
Erosion Control	1	lump sum	$8,000	$8,000
Security	45	days	$3,000	$135,000
Subtotal Capital Costs				$1,004,320
Capital Cost Contingency	10%	of Capital Costs		$100,432
Total Capital Costs				**$1,104,752**
ANNUAL O&M COSTS				
Fence & Sign Maintenance/Repair	1	lump sum	$5,000	$5,000
Site Security Patrols	52	weeks	$15,000	$780,000
Total Annual Costs				**$785,000**
Assume 5 years of O&M				
Annual O&M NPV, 5 years, 6.4% ENR Cost Index for Construction, January, 2002				$3,271,031
Annual Cost Contingency	10%	of annual costs		$78,500
Total 5 Year O&M NPV Cost				**$3,349,531**
TOTAL ALTERNATIVE COST, 5 YEARS				**$4,454,283**
TOTAL COST PER ACRE (483 ACRES)				**$9,222**

DEFINITIONS

EPA = U.S. Environmental Protection Agency
ENR = Engineering News Record
NPV = Net Present Value
OE = Ordnance & Explosives
O&M = Operations & Maintenance

ASSUMPTIONS

These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

[1] Costs based on recent Fort Ord specific data provided by USACE and Parsons, Inc.

Table C6. OE Remedial Action Cost Estimate
Subsurface OE Removal Alternative
Ranges 43-48
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE (1 FT. OE REMOVAL)	TOTAL (1 FT. OE REMOVAL) [1]	UNIT PRICE (4 FT. OE REMOVAL)	TOTAL (4 FT. OE REMOVAL) [1]
OE Survey	483	acres	$260	$125,508	$260	$125,508
OE Escort	483	acres	$87	$42,087	$87	$42,087
Followup Veg Clearance	483	acres	$3,560	$1,719,577	$3,560	$1,719,577
OE Escort - Followup Veg Clearance	483	acres	$697	$336,700	$697	$336,700
Visual Surface Sweep for Safety	417	acres	$3,346	$1,395,316	$3,346	$1,395,316
Visual Surface Sweep for Safety - Targets	66	acres	$16,730	$1,104,206	$16,730	$1,104,206
Digital Survey of Anomalies	483	acres	$2,111	$1,019,372	$2,111	$1,019,372
Reacquire Anomalies	483	acres	$2,345	$1,132,635	$2,814	$1,359,162
Excavate & Remove OE	417	acres	$3,486	$1,453,454	$3,802	$1,585,586
Excavate & Remove OE - Targets	66	acres	$4,647	$306,724	$5,228	$345,065
Quality Control	48	acres	$704	$33,769	$704	$33,769
Site Restoration - Followup Veg Clearance	48	acres	$1,017	$48,826	$1,017	$48,825
Site Restoration - OE Removal	483	acres	$1,564	$755,559	$1,739	$839,979
OE Residue Removal	483	acres	$155	$75,000	$155	$75,000
Total Field Costs [2]				$9,548,732		$10,030,150
Reporting	1	lump sum	$116,781	$116,781	$116,781	$116,781
Cost Subtotal				$9,665,513		$10,146,931
Cost Contingency	10%	of Cost Subtotal		$966,551		$1,014,693.14
Total Capital Costs				**$10,632,064**		**$11,161,625**
RANGE OF TOTAL ALTERNATIVE COSTS				**$10,632,064**	**to**	**$11,161,625**
RANGE OF TOTAL COSTS PER ACRE (483 ACRES)				**$22,013**	**to**	**$23,109**

DEFINITIONS
EPA = U.S. Environmental Protection Agency
ENR = Engineering News Record
NPV = Net Present Value
OE = Ordnance & Explosives
O&M = Operations & Maintenance

ASSUMPTIONS
These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

[1] Subsurface OE removal costs are assumed to fall within the range of estimated 1 ft. to 4 ft. OE removal costs based on recent Fort Ord specific data provided by Parsons, Inc
[2] Costs based on recent Fort Ord specific data provided by Parsons, Inc.

Table C7. OE Detonation Cost Estimate
Detonation With Engineering Controls Alternative
Ranges 43-48
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
Detonation & Consolidation [1]	483	acres	$1,836	$886,667
Engineering Controls [2]	483	acres	$183	$88,452
Total Field Costs				$975,119
Cost Subtotal				$975,119
Cost Contingency	10%	of Cost Subtotal		$97,512
Total Capital Costs				**$1,072,631**
TOTAL ALTERNATIVE COST				**$1,072,631**
TOTAL COST PER ACRE (483 ACRES)				**$2,221**

DEFINITIONS

OE = Ordnance & Explosives

ASSUMPTIONS

These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

[1] 1900 man-hrs for detonation with engineering controls during recent Ranges 43-48 surface OE removal x $70/hr = $133,000 (data provided by Parsons, Inc.). Data for 30% of site, so for whole site divide by 0.3 = $443,333. Assume same density of OE in subsurface (multiply by 2) = $886,667.

[2] 2457 OE items located in recent Ranges 43-48 surface OE removal (data provided by Parsons, Inc.). Data for 30% of site, so for whole site divide by 0.3 = 8,190 OE items. Assume same density of OE in subsurface (multiply by 2) = 16,380 items. Assume $4.5/item for explosives and $0.90/item for sandbags, wood, pools = $5.4/item total. 16,380 OE items x $5.4 = $88,452

Table C8. OE Detonation Cost Estimate
Detonation Chamber and Detonation w/ Engineering Controls Alternative
Ranges 43-48
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
Detonation & Consolidation (95% OE Items) [1]	483	acres	$1,744	$842,334
Engineering Controls (95% of OE Items) [2]	483	acres	$183	$88,452
Detonation Chamber (5% of OE Items) [3]	483	acres	$219	$106,000
Total Field Costs [4]				$1,036,786
Cost Subtotal				$1,036,786
Cost Contingency	10%	of Cost Subtotal		$103,679
Total Capital Costs				**$1,140,465**
TOTAL ALTERNATIVE COST				**$1,140,465**
TOTAL COST PER ACRE (483 ACRES)				**$2,361**

DEFINITIONS

OE = Ordnance & Explosives

ASSUMPTIONS

These costs are for comparison purposes only, and have an accuracy of +50/-30%.

Many design variables and necessary prefield activities have not been established.

Cost estimates will be refined after the field preparation/design is completed.

[1] 1900 man-hrs for detonation with engineering controls during recent Ranges 43-48 surface OE removal x $70/hr = $133,000 (data provided by Parsons, Inc.). Data for 30% of site, so for whole site divide by 0.3 = $443,333. Assume same density of OE in subsurface (multiply by 2) = $886,667. Assume 95% of items detonated w/engr controls /5 % detonated in chamber. $886,667 x 0.95 = $842,334

[2] 2457 OE items located in recent Ranges 43-48 surface OE removal (data provided by Parsons, Inc.). Data for 30% of site, so for whole site divide by 0.3 = 8,190 OE items. Assume same density of OE in subsurface (multiply by 2) = 16,380 items. Assume $4.5/item for explosives and $0.90/item for sandbags, wood, pools = $5.4/item total. 16,380 OE items x $5.4 = $88,452

[3] 134 OE items eligible for transport to detonation chamber identified in recent Ranges 43-48 surface OE removal (data provided by Parsons, Inc.). Data for 30% of site, so for whole site divide by 0.3 = 447 OE items. Assume same density of OE in subsurface (multiply by 2) = 894 OE items. DeMill Donovan chamber cost estimate assumes 96 items can be processed per day = 9.3 days >assume 10 days @ $7150/day = $71,500. Assume 1 filter replaced/day @ $650 each ($6,500) + $8,000 equipment mobe + $20,000 travel = $106,000

[4] Because the Detonation Chamber is a stationary device, it cannot be moved over the 483 acres at Ranges 43-48. UXO items found must be transported to the chamber for detonation, which could be temporarily located at each of 5 access gates to the site. Based on recent Ranges 43-48-specific surface OE removal data, it is estimated that approximately 95% of UXO items that are anticipated to be found at Ranges 43-48 are too dangerous to be transported to the five temporary detonation chamber locations (data provided by Parsons, Inc.). Therefore, costs associated with detonation in the chamber are only for 5% of UXO items that may be found; the rest of the UXO items (95%) would be unsafe to move and would have to be detonated where they are found using engineering controls.

RANGE 30A

COST ESTIMATES
(TABLES C9-C16)

Table C9. Vegetation Clearance Cost Estimate
Prescribed Burning Alternative
Range 30A
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
CAPITAL COSTS [1]				
Planning, Tech Support, Meteorological Profiling, Set-Up	388	acres	$535	$207,580
Install Primary Fuelbreak	388	acres	$310	$120,280
Conduct Prescribed Burn	388	acres	$1,250	$485,000
Community Relations	388	acres	$360	$139,680
Residential Relocation	388	acres	$180	$69,840
Air Sampling & Monitoring	388	acres	$450	$174,600
Security	3	weeks	$15,000	$45,000
Subtotal Capital Costs				$1,241,980
Capital Cost Contingency	10%	of Capital Costs		$124,198
Total Capital Costs				**$1,366,178**
ANNUAL O&M COSTS				
HMP Species Recovery Monitoring [2]	1	lump sum	$35,000	$35,000
Total Annual Costs				**$35,000**
Assume 5 years of O&M				
Annual O&M NPV, 5 years, 6.4% ENR Cost Index for Construction, January, 2002				$145,842
Annual Cost Contingency	10%	of annual costs		$3,500
Total 5 Year O&M NPV Cost				**$149,342**
TOTAL ALTERNATIVE COST, 5 YEARS				**$1,515,520**
TOTAL COST PER ACRE (388 ACRES)				**$3,906**

DEFINITIONS

ENR = Engineering News Record
HMP = Habitat Management Plan
NPV = Net Present Value
O&M = Operations & Maintenance

ASSUMPTIONS

These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

[1] Costs based on recent Fort Ord specific data provided by USACE and Parsons, Inc.

[2] Actual HMP Species Recovery Monitoring O&M costs would be significantly higher for Mechanical or Manual Methods than for Prescribed Burning, the only method approved for use in CMC habitat areas greater than 50 acres.

Table C10. Vegetation Clearance Cost Estimate
Mechanical Clearance Alternative
Range 30A
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
CAPITAL COSTS [1]				
Mechanical Cutting & Chipping (2 passes/double cut method)	388	acres	$1,150	$446,200
Site Restoration	388	acres	$500	$194,000
Security	23	weeks	$15,000	$345,000
Subtotal Capital Costs				$985,200
Capital Cost Contingency	10%	of Capital Costs		$98,520
Total Capital Costs				**$1,083,720**
ANNUAL O&M COSTS				
HMP Species Recovery Monitoring [2]	1	lump sum	$35,000	$35,000
Total Annual Costs				**$35,000**
Assume 5 years of O&M				
Annual O&M NPV, 5 years, 6.4% ENR Cost Index for Construction, January, 2002				$145,842
Annual Cost Contingency	10%	of annual costs		$3,500
Total 5 Year O&M NPV Cost				**$149,342**
TOTAL ALTERNATIVE COST, 5 YEARS				**$1,233,062**
TOTAL COST PER ACRE (388 ACRES)				**$3,178**

DEFINITIONS

ENR = Engineering News Record
HMP = Habitat Management Plan
NPV = Net Present Value
O&M = Operations & Maintenance

ASSUMPTIONS

These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

Actual HMP Species Recovery Monitoring O&M costs would be significantly higher for Mechanical Methods than for Prescribed Burning, the only method approved for use in CMC habitat areas greater than 50 acres.

[1] Costs based on recent Fort Ord specific data provided by USACE and Parsons, Inc.

[2] Actual HMP Species Recovery Monitoring O&M costs would be significantly higher for Mechanical or Manual Methods than for Prescribed Burning, the only method approved for use in CMC habitat areas greater than 50 acres.

Table C11. Vegetation Clearance Cost Estimate
Manual Clearance Alternative
Range 30A
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
CAPITAL COSTS [1]				
Manual Cutting	388	acres	$2,400	$931,200
Hauling & Chipping	388	acres	$650	$252,200
Site Restoration	388	acres	$500	$194,000
Security	28	weeks	$15,000	$420,000
Subtotal Capital Costs				$1,797,400
Capital Cost Contingency	10%	of Capital Costs		$179,740
Total Capital Costs				**$1,977,140**
ANNUAL O&M COSTS				
HMP Species Recovery Monitoring [2]	1	lump sum	$35,000	$35,000
Total Annual Costs				**$35,000**
Assume 5 years of O&M				
Annual O&M NPV, 5 years, 6.4% ENR Cost Index for Construction, January, 2002				$145,842
Annual Cost Contingency	10%	of annual costs		$3,500
Total 5 Year O&M NPV Cost				**$149,342**
TOTAL ALTERNATIVE COST, 5 YEARS				**$2,126,482**
TOTAL COST PER ACRE (388 ACRES)				**$5,481**

DEFINITIONS

ENR = Engineering News Record
HMP = Habitat Management Plan
NPV = Net Present Value
O&M = Operations & Maintenance

ASSUMPTIONS

These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

[1] Costs based on recent Fort Ord specific data provided by USACE and Parsons, Inc.

[2] Actual HMP Species Recovery Monitoring O&M costs would be significantly higher for Manual Methods than for Prescribed Burning, the only method approved for use in CMC habitat areas greater than 50 acres.

Table C12. OE Remedial Action Cost Estimate
No Action w/ Existing Site Security Measures Alternative
Range 30A
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
ANNUAL O&M COSTS [1]				
Existing Fence & Sign Maintenance/Repair	1	lump sum	$3,500	$3,500
Site Security Patrols	1	lump sum	$35,000	$35,000
Total Annual Costs				**$38,500**
Assume 5 years of O&M				
Annual O&M NPV, 5 years, 6.4% ENR Cost Index for Construction, January, 2002				$160,426
Annual Cost Contingency	10%	of annual costs		$3,850
Total 5 Year O&M NPV Cost				**$164,276**
TOTAL ALTERNATIVE COST, 5 YEARS				**$164,276**
TOTAL COST PER ACRE (388 ACRES)				**$423**

DEFINITIONS

EPA = U.S. Environmental Protection Agency
ENR = Engineering News Record
NPV = Net Present Value
O&M = Operations & Maintenance

ASSUMPTIONS

These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

[1] Costs based on recent Fort Ord specific data provided by USACE and Parsons, Inc.

Table C13. OE Remedial Action Cost Estimate
Enhanced Site Security Measures Alternative
Range 30A
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
CAPITAL COSTS [1]				
Survey Perimeter/Site Preparation/Mobe/Demobe	1	lump sum	$10,000	$10,000
Install 10-ft. Chain Link w/Concertina Wire (2 crews)	18,600	feet	$40	$744,000
OE Escorts (2)	35	days	$1,400	$49,000
Post Warning Signs Every 100 ft.	186	signs	$10	$1,860
Post Large Warning Signs at Access Gates	5	signs	$200	$1,000
Erosion Control	1	lump sum	$5,600	$5,600
Security	35	days	$3,000	$105,000
Subtotal Capital Costs				$916,460
Capital Cost Contingency	10%	of Capital Costs		$91,646
Total Capital Costs				**$1,008,106**
ANNUAL O&M COSTS [1]				
Fence & Sign Maintenance/Repair	1	lump sum	$3,500	$3,500
Site Security Patrols	52	weeks	$14,400	$748,800
Total Annual Costs				**$752,300**
Assume 5 years of O&M				
Annual O&M NPV, 5 years, 6.4% ENR Cost Index for Construction, January, 2002				$3,134,773
Annual Cost Contingency	10%	of annual costs		$75,230
Total 5 Year O&M NPV Cost				**$3,210,003**
TOTAL ALTERNATIVE COST, 5 YEARS				**$4,218,109**
TOTAL COST PER ACRE (388 ACRES)				**$10,871**

DEFINITIONS

EPA = U.S. Environmental Protection Agency
ENR = Engineering News Record
NPV = Net Present Value
OE = Ordnance & Explosives
O&M = Operations & Maintenance

ASSUMPTIONS

These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

[1] Costs based on recent Fort Ord specific data provided by USACE and Parsons, Inc.

Table C14. OE Remedial Action Cost Estimate
Subsurface OE Removal Alternative
Range 30A
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE (1 FT. OE REMOVAL)	TOTAL (1 FT. OE REMOVAL) [1]	UNIT PRICE (4 FT. OE REMOVAL)	TOTAL (4 FT. OE REMOVAL) [1]
OE Survey	388	acres	$260	$100,822	$260	$100,822
OE Escort	388	acres	$87	$33,809	$87	$33,809
Followup Veg Clearance	388	acres	$3,560	$1,381,358	$3,560	$1,381,358
OE Escort - Followup Veg Clearance	388	acres	$697	$270,475	$697	$270,475
Visual Surface Sweep for Safety	359	acres	$3,346	$1,201,243	$3,616	$1,298,279
Visual Surface Sweep for Safety - Targets	19	acres	$16,730	$317,878	$8,365	$158,939
Digital Survey of Anomalies	388	acres	$2,145	$832,230	$1,407	$545,916
Reacquire Anomalies	388	acres	$1,407	$545,916	$2,010	$779,880
Excavate & Remove OE	388	acres	$2,145	$832,230	$4,476	$1,736,766
Quality Control	39	acres	$704	$27,437	$704	$27,437
Site Restoration - Followup Veg Clearance	4	acres	$1,017	$4,069	$1,017	$4,069
Site Restoration - OE Removal	388	acres	$1,191	$462,200	$1,322	$512,852
OE Residue Removal	388	acres	$129	$50,000	$129	$50,000
Total Field Costs [2]				$6,059,666		$6,900,602
Reporting	1	lump sum	$116,781	$116,781	$116,781	$116,781
Cost Subtotal				$6,176,447		$7,017,383
Cost Contingency	10%	of Cost Subtotal		$617,645		$701,738.25
Total Capital Costs				**$6,794,092**		**$7,719,121**
RANGE OF TOTAL ALTERNATIVE COSTS				**$6,794,092**	**to**	**$7,719,121**
RANGE OF TOTAL COSTS PER ACRE (388 ACRES)				**$17,511**	**to**	**$19,895**

DEFINITIONS

EPA = U.S. Environmental Protection Agency
ENR = Engineering News Record
NPV = Net Present Value
OE = Ordnance & Explosives
O&M = Operations & Maintenance

ASSUMPTIONS

These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

[1] Subsurface OE removal costs are assumed to fall within the range of estimated 1 ft. to 4 ft. OE removal costs based on recent Fort Ord specific data provided by Parsons, Inc
[2] Costs based on recent Fort Ord specific data provided by Parsons, Inc.

Table C15. OE Detonation Cost Estimate
Detonation With Engineering Controls Alternative
Range 30A
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
Detonation & Consolidation [1]	388	acres	$267	$103,600
Engineering Controls [2]	388	acres	$23	$9,072
Total Field Costs				$112,672
Cost Subtotal				$112,672
Cost Contingency	10%	of Cost Subtotal		$11,267
Total Capital Costs				**$123,939**
TOTAL ALTERNATIVE COST				**$123,939**
TOTAL COST PER ACRE (388 ACRES)				**$319**

DEFINITIONS

OE = Ordnance & Explosives

ASSUMPTIONS

These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

[1] 222 man-hrs for detonation with engineering controls during recent Ranges 30A surface OE removal x $70/hr = $15,540 (data provided by Parsons, Inc.). Data for 30% of site, so for whole site divide by 0.3 = $51,800. Assume same density of OE in subsurface (multiply by 2) = $103,600.

[2] 252 OE items located in recent Range 30A surface OE removal (data provided by Parsons, Inc.). Data for 30% of site, so for whole site divide by 0.3 = 840 OE items. Assume same density of OE in subsurface (multiply by 2) = 1,680 items. Assume $4.5/item for explosives and $0.90/item for sandbags, wood, pools = $5.4/item total. 1,680 OE items x $5.4 = $9,072

Table C16. OE Detonation Cost Estimate
Detonation Chamber and Detonation w/ Engineering Controls Alternative
Range 30A
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
Detonation & Consolidation (90% of UXO Items) [1]	388	acres	$240	$93,240
Engineering Controls (90% of OE Items) [2]	388	acres	$21	$8,165
Detonation Chamber (10% of OE Items) [3]	388	acres	$58	$22,600
Total Field Costs [4]				$124,005
Cost Subtotal				$124,005
Cost Contingency	10%	of Cost Subtotal		$12,400
Total Capital Costs				**$136,405**
TOTAL ALTERNATIVE COST				**$136,405**
TOTAL COST PER ACRE (388 ACRES)				**$352**

DEFINITIONS
OE = Ordnance & Explosives

ASSUMPTIONS
These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

[1] 222 man-hrs for detonation with engineering controls during recent Ranges 30A surface OE removal x $70/hr = $15,540 (data provided by Parsons, Inc.). Data for 30% of site, so for whole site divide by 0.3 = $51,800. Assume same density of OE in subsurface (multiply by 2) = $103,600. Assume 90% of items detonated w/engr controls /10 % detonated in chamber. $103,600 x 0.90 = $93,240.

[2] 252 OE items located in recent Range 30A surface OE removal (data provided by Parsons, Inc.). Data for 30% of site, so for whole site divide by 0.3 = 840 OE items. Assume same density of OE in subsurface (multiply by 2) = 1,680 items. Assume $4.5/item for explosives and $0.90/item for sandbags, wood, pools = $5.4/item total. 1,680 OE items x $5.4 = $9,072. Assume 90% of items detonated w/engr controls /10 % detonated in chamber. $9,072 x 0.90 = $8,165.

[3] Assume 10% of 1,680 OE items can be detonated in chamber = 168 OE items. DeMill Donovan chamber cost estimate assumes 96 items can be processed per day = 1.75 days > assume 2 days @ $7150/day = $14,300. Assume 1 filter replaced/day @ $650 each ($1,300) + $2,000 equipment mobe + $5,000 travel = $22,600

[4] Because the Detonation Chamber is a stationary device, it cannot be moved over the 388 acres at Range 30A. UXO items found must be transported to the chamber for detonation, which could be temporarily located at each of 5 access gates to the site. It is estimated that approximately 90% of UXO items that are anticipated to be found at Range 30A are too dangerous to be transported to the five temporary detonation chamber locations. Therefore, costs associated with detonation in the chamber are only for 10% of UXO items that may be found; the rest of the UXO items (90%) would be unsafe to move and would have to be detonated where they are found using engineering controls.

SITE OE-16

COST ESTIMATES
(TABLES C17-C24)

Table C17. Vegetation Clearance Cost Estimate
Prescribed Burning Alternative
Site OE-16
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
CAPITAL COSTS [1]				
Planning, Tech Support, Meteorological Profiling, Set-Up	80	acres	$535	$42,800
Install Primary Fuelbreak	80	acres	$310	$24,800
Conduct Prescribed Burn	80	acres	$1,250	$100,000
Community Relations	80	acres	$360	$28,800
Residential Relocation	80	acres	$180	$14,400
Air Sampling & Monitoring	80	acres	$450	$36,000
Security	1	week	$15,000	$15,000
Subtotal Capital Costs				$261,800
Capital Cost Contingency	10%	of Capital Costs		$26,180
Total Capital Costs				**$287,980**
ANNUAL O&M COSTS				
HMP Species Recovery Monitoring [2]	1	lump sum	$7,000	$7,000
Total Annual Costs				**$7,000**
Assume 5 years of O&M				
Annual O&M NPV, 5 years, 6.4% ENR Cost Index for Construction, January, 2002				$29,168
Annual Cost Contingency	10%	of annual costs		$700
Total 5 Year O&M NPV Cost				**$29,868**
TOTAL ALTERNATIVE COST, 5 YEARS				**$317,848**
TOTAL COST PER ACRE (80 ACRES)				**$3,973**

DEFINITIONS

ENR = Engineering News Record
HMP = Habitat Management Plan
NPV = Net Present Value
O&M = Operations & Maintenance

ASSUMPTIONS

These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

[1] Costs based on recent Fort Ord specific data provided by USACE and Parsons, Inc.

[2] Actual HMP Species Recovery Monitoring O&M costs would be significantly higher for Mechanical or Manual Methods than for Prescribed Burning, the only method approved for use in CMC habitat areas greater than 50 acres.

Table C18. Vegetation Clearance Cost Estimate
Mechanical Clearance Alternative
Site OE-16
Interim Action OE Remedial Investigation/Feasibility Study, Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
CAPITAL COSTS [1]				
Mechanical Cutting & Chipping (2 passes/double cut method)	80	acres	$1,150	$92,000
Site Restoration	80	acres	$500	$40,000
Security	5	weeks	$15,000	$75,000
Subtotal Capital Costs				$207,000
Capital Cost Contingency	10%	of Capital Costs		$20,700
Total Capital Costs				**$227,700**
ANNUAL O&M COSTS				
HMP Species Recovery Monitoring [2]	1	lump sum	$7,000	$7,000
Total Annual Costs				**$7,000**
Assume 5 years of O&M				
Annual O&M NPV, 5 years, 6.4% ENR Cost Index for Construction, January, 2002				$29,168
Annual Cost Contingency	10%	of annual costs		$700
Total 5 Year O&M NPV Cost				**$29,868**
TOTAL ALTERNATIVE COST, 5 YEARS				**$257,568**
TOTAL COST PER ACRE (80 ACRES)				**$3,220**

DEFINITIONS

ENR = Engineering News Record
HMP = Habitat Management Plan
NPV = Net Present Value
O&M = Operations & Maintenance

ASSUMPTIONS

These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

[1] Costs based on recent Fort Ord specific data provided by USACE and Parsons, Inc.

[2] Actual HMP Species Recovery Monitoring O&M costs would be significantly higher for Mechanical or Manual Methods than for Prescribed Burning, the only method approved for use in CMC habitat areas greater than 50 acres.

Table C19. Vegetation Clearance Cost Estimate
Manual Clearance Alternative
Site OE-16
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
CAPITAL COSTS [1]				
Manual Cutting	80	acres	$2,400	$192,000
Hauling & Chipping	80	acres	$650	$52,000
Site Restoration	80	acres	$500	$40,000
Security	6	weeks	$15,000	$90,000
Subtotal Capital Costs				$374,000
Capital Cost Contingency	10%	of Capital Costs		$37,400
Total Capital Costs				**$411,400**
ANNUAL O&M COSTS				
HMP Species Recovery Monitoring [2]	1	lump sum	$7,000	$7,000
Total Annual Costs				**$7,000**
Assume 5 years of O&M				
Annual O&M NPV, 5 years, 6.4% ENR Cost Index for Construction, January, 2002				$29,168
Annual Cost Contingency	10%	of annual costs		$700
Total 5 Year O&M NPV Cost				**$29,868**
TOTAL ALTERNATIVE COST, 5 YEARS				**$441,268**
TOTAL COST PER ACRE (80 ACRES)				**$5,516**

DEFINITIONS

ENR = Engineering News Record
HMP = Habitat Management Plan
NPV = Net Present Value
O&M = Operations & Maintenance

ASSUMPTIONS

These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

[1] Costs based on recent Fort Ord specific data provided by USACE and Parsons, Inc.

[2] Actual HMP Species Recovery Monitoring O&M costs would be significantly higher for Manual or Mechanical Methods than for Prescribed Burning, the only vegetation clearance method approved under the HMP for CMC habitat greater than 50 acres.

Table C20. OE Remedial Action Cost Estimate
No Action w/ Existing Site Security Measures Alternative
Site OE-16
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
ANNUAL O&M COSTS [1]				
Existing Fence & Sign Maintenance/Repair	1	lump sum	$750	$750
Site Security Patrols	1	lump sum	$7,500	$7,500
Total Annual Costs				**$8,250**
Assume 5 years of O&M				
Annual O&M NPV, 5 years, 6.4% ENR Cost Index for Construction, January, 2002				$34,377
Annual Cost Contingency	10%	of annual costs		$825
Total 5 Year O&M NPV Cost				**$35,202**
TOTAL ALTERNATIVE COST, 5 YEARS				**$35,202**
TOTAL COST PER ACRE (80 ACRES)				**$440**

DEFINITIONS

EPA = U.S. Environmental Protection Agency
ENR = Engineering News Record
NPV = Net Present Value
O&M = Operations & Maintenance

ASSUMPTIONS

These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

[1] Costs based on recent Fort Ord specific data provided by USACE and Parsons, Inc.

Table C21. OE Remedial Action Cost Estimate
Enhanced Site Security Measures Alternative
Site OE-16
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
CAPITAL COSTS [1]				
Survey Perimeter/Site Preparation/Mobe/Demobe	1	lump sum	$10,000	$10,000
Install 10-ft. Chain Link w/Concertina Wire (2 crews)	8,300	feet	$40	$332,000
OE Escorts (2)	7	days	$1,400	$9,800
Post Warning Signs Every 100 ft.	9	signs	$10	$90
Post Large Warning Signs at Access Gates	1	signs	$200	$200
Erosion Control	1	lump sum	$1,100	$1,100
Security	7	days	$3,000	$21,000
Subtotal Capital Costs				$374,190
Capital Cost Contingency	10%	of Capital Costs		$37,419
Total Capital Costs				**$411,609**
ANNUAL O&M COSTS				
Fence & Sign Maintenance/Repair	1	lump sum	$1,000	$1,000
Site Security Patrols	52	weeks	$6,450	$335,400
Total Annual Costs				**$336,400**
Assume 5 years of O&M				
Annual O&M NPV, 5 years, 6.4% ENR Cost Index for Construction, January, 2002				$1,401,752
Annual Cost Contingency	10%	of annual costs		$33,640
Total 5 Year O&M NPV Cost				**$1,435,392**
TOTAL ALTERNATIVE COST, 5 YEARS				**$1,847,001**
TOTAL COST PER ACRE (80 ACRES)				**$23,088**

DEFINITIONS

EPA = U.S. Environmental Protection Agency
ENR = Engineering News Record
NPV = Net Present Value
OE = Ordnance & Explosives
O&M = Operations & Maintenance

ASSUMPTIONS

These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

[1] Costs based on recent Fort Ord specific data provided by USACE and Parsons, Inc.

Table C22. OE Remedial Action Cost Estimate
Subsurface OE Removal Alternative
SIte OE-16
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE (1 FT. OE REMOVAL)	TOTAL PRICE (1 FT. OE REMOVAL)	UNIT PRICE (4 FT. OE REMOVAL)	TOTAL PRICE (4 FT. OE REMOVAL)
OE Survey	80	acres	$260	$20,788	$260	$20,788
OE Escort	80	acres	$87	$6,971	$87	$6,971
Followup Veg Clearance	80	acres	$3,560	$284,816	$3,560	$284,816
OE Escort - Followup Veg Clearance	80	acres	$697	$55,768	$697	$55,768
Visual Surface Sweep for Safety	69	acres	$4,061	$280,193	$4,061	$280,193
Digital Survey of Anomalies	80	acres	$1,407	$112,560	$1,407	$112,560
Reacquire Anomalies	80	acres	$1,126	$90,048	$1,173	$93,800
Excavate & Remove OE	69	acres	$2,021	$139,420	$1,940	$133,843
Quality Control	8	acres	$704	$5,628	$792	$6,332
Site Restoration - Followup Veg Clearance	8	acres	$1,144	$9,155	$1,144	$9,155
Security	80	acres	$250	$20,000	$260	$20,800
Site Restoration - OE Removal	80	acres	$660	$52,763	$686	$54,873
OE Residue Removal	80	acres	$188	$15,000	$188	$15,000
Total Field Costs [2]				$1,093,111		$1,094,900
Reporting	1	lump sum		$87,234		$87,234
Cost Subtotal				$1,180,345		$1,182,134
Cost Contingency	10%	of Cost Subtotal		$118,034		$118,213
Total Capital Costs				**$1,298,379**		**$1,300,347**
RANGE OF TOTAL ALTERNATIVE COSTS				**$1,298,379**	**to**	**$1,300,347**
RANGE OF TOTAL COSTS PER ACRE (80 ACRES)				**$16,230**	**to**	**$16,254**

DEFINITIONS
OE = Ordnance & Explosives

ASSUMPTIONS
These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

[1] Subsurface OE removal costs are assumed to fall within the range of estimated 1 ft. to 4 ft. OE removal costs based on recent Fort Ord specific data provided by Parsons, Inc

[2] Costs based on recent Fort Ord specific data provided by Parsons, Inc.

Table C23. OE Detonation Cost Estimate
Detonation With Engineering Controls Alternative
Site OE-16
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
Detonation & Consolidation [1]	80	acres	$140	$11,200
Engineering Controls [2]	80	acres	$2	$184
Total Field Costs				$11,384
Cost Subtotal				$11,384
Cost Contingency	10%	of Cost Subtotal		$1,138
Total Capital Costs				**$12,522**
TOTAL ALTERNATIVE COST				**$12,522**
TOTAL COST PER ACRE (80 ACRES)				**$157**

DEFINITIONS

OE = Ordnance & Explosives

ASSUMPTIONS

These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

[1] 24 man-hrs for detonation with engineering controls during recent Site OE-16 surface OE removal x $70/hr = $1,680 (data provided by Parsons, Inc.). Data for 30% of site, so for whole site divide by 0.3 = $5,600. Assume same density of OE in subsurface (multiply by 2) = $11,200.

[2] 5 OE items located in recent Site OE-16 surface OE removal (data provided by Parsons, Inc.). Data for 30% of site, so for whole site divide by 0.3 = 17 OE items. Assume same density of OE in subsurface (multiply by 2) = 34 items. Assume $4.5/item for explosives and $0.90/item for sandbags, wood, pools = $5.4/item total. 34 OE items x $5.4 = $184

Table C24. OE Detonation Cost Estimate
Detonation Chamber and Detonation w/ Engineering Controls Alternative
Site OE-16
Interim Action OE Remedial Investigation/Feasibility Study,
Fort Ord, California

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
Detonation & Consolidation (90% of UXO Items) [1]	80	acres	$126	$10,080
Engineering Controls (90% of UXO Items) [2]	80	acres	$2	$166
Detonation Chamber (10% of UXO Items) [3]	80	acres	$185	$14,800
Total Field Costs [4]				$25,046
Cost Subtotal				$25,046
Cost Contingency	10%	of Cost Subtotal		$2,505
Total Capital Costs				**$27,551**
TOTAL ALTERNATIVE COST				**$27,551**
TOTAL COST PER ACRE (80 ACRES)				**$344**

DEFINITIONS
OE = Ordnance & Explosives

ASSUMPTIONS
These costs are for comparison purposes only, and have an accuracy of +50/-30%.
Many design variables and necessary prefield activities have not been established.
Cost estimates will be refined after the field preparation/design is completed.

[1] 24 man-hrs for detonation with engineering controls during recent Site OE-16 surface OE removal x $70/hr = $1,680 (data provided by Parsons, Inc.). Data for 30% of site, so for whole site divide by 0.3 = $5,600. Assume same density of OE in subsurface (multiply by 2) = $11,200. Assume 90% of items detonated w/engr controls /10 % detonated in chamber. $11,200 x 0.90 = $10,080.

[2] 5 OE items located in recent Site OE-16 surface OE removal (data provided by Parsons, Inc.). Data for 30% of site, so for whole site divide by 0.3 = 17 OE items. Assume same density of OE in subsurface (multiply by 2) = 34 items. Assume $4.5/item for explosives and $0.90/item for sandbags, wood, pools = $5.4/item total. 34 OE items x $5.4 = $184. Assume 90% of items detonated w/engr controls /10 % detonated in chamber. $184 x 0.90 = $166.
[3] Assume 10% of 34 OE items can be detonated in chamber = 4 OE items. DeMill Donovan chamber cost estimate assumes 96 items can be processed per day > assume 1 day @ $7150/day = $7,150. Assume 1 filter replaced/day @ $650 each ($650) + $2,000 equipment mobe + $5,000 travel = $14,800

[4] Because the Detonation Chamber is a stationary device, it cannot be moved over the 80 acres at Site OE-16. UXO items found must be transported to the chamber for detonation, which could be temporarily located at each of 2 access gates to the site. It is estimated that approximately 90% of UXO items that are anticipated to be found at Site OE-16 are too dangerous to be transported to the two temporary detonation chamber locations. Therefore, costs associated with detonation in the chamber are only for 10% of UXO items that may be found; the rest of the UXO items (90%) would be unsafe to move and would have to be detonated where they are found using engineering controls.

APPENDIX D

RESPONSES TO COMMENTS ON THE DRAFT INTERIM ACTION ORDNANCE AND EXPLOSIVES REMEDIAL INVESTIGATION/FEASIBILITY STUDY FOR RANGES 43-48, RANGE 30A, SITE OE-16 (DRAFT IA RI/FS), FORMER FORT ORD, CALIFORNIA, OCTOBER 23, 2001

APPENDIX D

RESPONSE TO COMMENTS ON THE DRAFT INTERIM ACTION ORDNANCE AND EXPLOSIVES REMEDIAL INVESTIGATION/FEASIBILITY STUDY FOR RANGES 43-48, RANGE 30A, SITE OE-16 (DRAFT IA RI/FS) FORMER FORT ORD, CALIFORNIA OCTOBER 23, 2001

I. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, REGION IX COMMENTS DATED DECEMBER 7, 2001

The study was prepared to address the ordnance and explosives (OE) located in the listed areas of the facility and to take quick action to: (1) protect human health and the environment from hazards in the short term, pending the development of a final remedial solution, and (2) institute temporary measures to stabilize the site and prevent further migration or degradation. A review of the document has been completed, and the following is submitted:

General Comments:

Comment 1: **Each of the areas studied (Ranges 43-48, Range 30A, Site OE-16) seems to have been treated as almost distinct and homogeneous areas with respect to the Vegetation Clearance and OE Remedial Actions selected. It appears that no consideration was given to evaluating the use of a combination of two or more of the proposed Vegetation Clearance or OE Remedial Actions in any of the specific areas. While there may be sufficient reasons to discount the viability of such actions, these reasons are not presented in the document. If this review of multiple options was accomplished during the study, please include a statement to that effect in an appropriate portion of the document and describe the results. If the use of multiple options was not considered, please identify the reasons.**

Response 1: The Army considered the use of different alternatives and combinations of alternatives for specific areas within each of the IA sites; however, there were sufficient reasons to discount the viability of such actions for vegetation clearance and OE remedial action at the time the Draft IA RI/FS was prepared. For OE detonation, a combination of alternatives was evaluated for specific areas within IA sites containing transportable or nontransportable OE items. Section 6.3 (Evaluation and Comparison of Interim Action Alternatives) of the Draft IA RI/FS has been revised to include: 1) a discussion of the process used in evaluating proposed alternatives or combinations of alternatives for specific areas within each of the IA sites, and 2) the rationales for selecting single alternatives for each of the IA sites as summarized below.

Vegetation Clearance: Since preparation of the Draft IA RI/FS and receipt of regulatory agency comments, the Army has reconsidered the use of mechanical clearance in specific areas and has decided to adjust the Ranges 43-48 IA site boundary to exclude an area of

approximately 72 acres planned for future development (Sites OE-15SEA.4 and OE-15MOCO.2 in the northern portion of Ranges 43-48). A non-time critical removal action authority to cleanup OE in this area prior to implementing the interim action is under consideration. According to onsite OE safety personnel, areas behind the firing lines of these OE sites could be safely cleared of vegetation using mechanical clearance methods. The Army has determined the use of mechanical clearance in these areas would comply with the Endangered Species Act (ESA) and Habitat Management Plan (HMP) that restrict the use of mechanical clearance methods in the central maritime chaparral (CMC) habitat present over the majority of land in the current Ranges 43-48 IA site boundary.

The Draft IA RI/FS has been revised to reflect these changes, and Section 6.3 (Evaluation and Comparison of Interim Action Alternatives) of the Draft IA RI/FS has been revised to include: 1) a discussion of the process used in evaluating proposed alternatives or combinations of alternatives for specific areas within each of the IA sites, and 2) the rationales for selecting single alternatives for each of the IA sites as summarized below.

Prescribed burning was selected as the only method for each IA site because it: 1) is the most effective method for reducing vegetation to within six inches of ground surface to allow for safe operation of OE detection equipment during OE remedial action, and 2) is the only method approved for widespread use in CMC habitat present over the majority of the IA sites based on HMP requirements that limit the use of other methods to areas less than 50 acres in size. The use of other vegetation clearance methods would only be applicable to less than 5 percent (50 acres of 1,023 total acres) of the IA sites, would take much longer to implement than burning, and were therefore not selected because significant benefits in adopting a piecemeal approach to vegetation clearance were not identified (except in the 72 acres of development area as described above).

OE Remedial Action: Subsurface OE Removal was selected as the only method for each of the IA sites because it is the most effective in eliminating OE hazards as compared to the other methods that enhance or maintain existing site security measures (fencing, warning signs, security patrols) which have been — and could continue to be — breached by trespassers, even with enhanced site security measures in place. Therefore, use of different methods (i.e., existing or enhanced site security measures) in certain areas was not considered further because significant benefits in adopting a piecemeal approach to OE remedial action were not identified.

Comment 2: **It is not obvious that the entire burn area can be cleared of UXO before vegetation reestablishes itself to a degree that would make UXO clearance hazardous. It is unlikely that a second burn over the same area would be allowed until a mature chaparral system reestablishes itself, which might take a decade or more. A second, unnatural burn that took place before mature chaparral species could produce seeds could destroy the habitat permanently.**

Please assess whether the UXO clearance can be conducted over the entire area of the burn before the vegetation regenerates to a point where UXO clearance would be dangerous.

Response 2: Section 6.3 (Evaluation and Comparison of Interim Action Alternatives) of the Draft IA RI/FS has been revised to include estimates of vegetation regrowth and OE Remedial

Action durations. Current estimates indicate OE remedial action at each of the IA sites could be completed before vegetation grows back to a level that would make OE remedial action hazardous. Initial removal of surface OE items is the only activity that must be performed within the timeframe before vegetation grows back. Based on past experience by the Army's OE contractor, surface removal can be performed within the regrowth period of approximately one year for each of the IA sites. Once surface OE has been removed, subsurface OE removal operations can be performed as vegetation gradually grows back and would not disrupt digital geophysical surveys, excavation, and removal of subsurface OE items.

Comment 3: **Many of the subsections of the document are unnumbered. When this absence of numbering is combined with the redundant use of the same titles for the subsections within subsequent sections, the potential for confusion on the part of the reader is amplified. It would improve the readability of the document if the bolded title subsections were numbered. For example, Section 6.1.3, OE Detonation Alternatives has three numbered subsections and six unnumbered subsections and sub-subsections. It is difficult to resolve their respective places in the document's hierarchy of organization. It would be much easier to understand this section if it were reorganized in a manner similar to the following example:**

6.1.3 OE Detonation Alternatives
- **6.1.3.1 OE Detonation Alternatives for OE Items with an Intact Fuze**
- **6.1.3.2 OE Detonation Alternatives for OE Items with No Fuze**
  - **6.1.3.2.1 No Action**
  - **6.1.3.2.2 Detonation with Engineering Controls**
  - **6.1.3.2.3 Detonation Chamber**
  - **6.1.3.2.4 Offsite Destruction**
- **6.1.3.3 OE Detonation Methods Retained for Consideration**
  - **6.1.3.3.1 No Action**
  - **6.1.3.3.2 Detonation with Engineering Controls**
  - **6.1.3.3.3 Detonation Chamber and Detonation with Engineering Controls Combined**

Please review the entire document sectional numbering system and revise it to improve the readability and to better identify the hierarchy of the subsections of the document.

Response 3: The document has been revised to include numbering of all 5th order subsection headings as suggested.

Comment 4: **The glossary contains a number of definitions that are found in 40 CFR Part 260, et al. (The Military Munitions Rule), or U. S. Army Corps of Engineers EP-1110-1-18 (Ordnance and Explosives Response, 24 April 2000), or the Compendium of Department of Defense Acronyms, Terms, and Definitions developed by the Interstate Technology and Regulatory Cooperation Work Group, dated December 2000. Some of those standard definitions found in the glossary have, however, been modified for some unidentified reason. While the use of terms and definitions specific to the former Fort Ord is acceptable, they should be identified as such to prevent the proliferation of differently worded definitions describing the**

same term. Please revise the glossary to either correct all nonstandard definitions or to identify them as such.

Response 4: The glossary has been revised to identify all nonstandard definitions as specific to Fort Ord as suggested. In addition, nonstandard definitions have been replaced with standard definitions as appropriate and all sources have been referenced.

Comment 5: The use of the acronyms "UXO" and "OE" in what appears to be a somewhat interchangeable manner in a number of sections of the document has resulted in a loss of technical preciseness that will likely confuse the reader as to exactly what is intended. For example, on page 85 in Section 6.1.3, OE Detonation Alternatives, subsection 1. "OE Items with an Intact Fuze," UXO is used throughout the discussion, and no reference is made to a non-UXO OE item with an intact fuze. The only reference to OE is in the title of the subsection. No attempt is made to discuss what is to be done concerning the non-UXO OE found with an intact fuze or in its original packing container. This movement back and forth between the terms OE and UXO when referring to the same ordnance items occurs a number of times elsewhere in the document.

Please review the definitions of OE and UXO found in EP 1110-1-18 and/or 40 CFR Part 260, et al., and correct any misapplication of the respective terms throughout the document and its appendices.

Response 5: The text has been revised as appropriate so the terms UXO and OE are consistently used throughout the document and its appendices as suggested. A fired 81mm mortar (HE) with an intact fuze would be "UXO with an intact fuze." An unfired 81mm mortar (HE) with an intact fuze (pin in place) would be "OE with an intact fuze." The same definitions would apply to the items with a damaged fuze or with no fuze at all. Unfired fuzed items in their original packing containers would be classified as OE.

Specific Comments:

Comment 1: Subsection 2.2 Purpose, second sentence, Page 5: This sentence states that "The purpose of this IA RI/FS is to describe the site conditions and the risks posed by OE at Ranges 43-48, Range 30A and Site OE-16, and recommend the most appropriate interim action to address explosive risks based on the criteria specified in the National Contingency Plan and EPA guidance." Generally, the term "explosive," as used by the military, means something that explodes. The term "explosives" usually refers to the substances that are contained in explosive items that cause them to explode.

Since the acronym "OE" has been used in the beginning of the sentence in question, to avoid misunderstanding, the term "explosive" should be replaced with the acronym "OE" in the remainder of the sentence. Please make this change.

Response 1: Section 2.2 (Purpose) and other portions of the document that use the term "explosive risks" or "explosive hazards" have been revised to replace the term with "OE risks or hazards.

Comment 2: **<u>Section 2.3 Objectives, third bullet, Page 6</u>: Procedurally, it is premature for the RI/FS to select the preferred alternative. That is the purpose of the Proposed Plan. However, it would be acceptable if the preferred alternative were preliminarily identified, as described in Section 7. Please change the language in the bullet accordingly.**

Response 2: Section 2.3 (Objectives) and other portions of the document that use the term "preferred alternative" have been revised to replace the term with "preliminarily identified preferred alternative" as suggested.

Comment 3: **<u>Section 3.3 OE RI/FS Background, second paragraph, fourth sentence, Page 21</u>: The sentence states that the Army is performing its activities in compliance with the NCP "removal" process. Please change to "remedial" process, as this is a remedial action.**

Response 3: Section 3.3 (OE RI/FS Background) has been revised to replace the term "removal" with "remedial" as suggested.

Comment 4: **<u>Section 4.0 Interim Action Remedial Investigation, subsection (unnumbered) entitled "Typical OE Related Characteristics," last sentence on the page, Page 22</u>: The sentence states "Although not in use for 8 years or longer, these IA sites still contain large quantities of unexploded ordnance (UXO)." This statement could be interpreted to infer that the lack of use for eight years would have some effect on the quantity of UXO present on the sites, which it doesn't. Please revise the sentence to remove the "although" inference that inactivity somehow reduces the UXO threat on a range.**

Response 4: Section 4.0 (Interim Action Remedial Investigation, Typical OE Related Characteristics) has been revised to clarify the statement as suggested. The statement was intended to indicate even though no OE-related activities have been conducted at the IA sites in eight years, significant potential OE hazards remain at the sites which have not become less significant with the passage of time.

Comment 5: **<u>Section 4.0 Interim Action Remedial Investigation, subsection (unnumbered) entitled "Interim Action Sites at Fort Ord," third bullet, Page 23</u>: In addition to what's presented in Tables 2 through 4, the text of the RI for each area should be enhanced to provide more "OE-Related Information: type, distribution, and quantity," as the bullet describes. Where such information is incomplete at this time, it can be explained that any removal effort will allow the Army to collect information needed to support a finding of protectiveness in the final Record of Decision.**

Response 5: Section 4.0 (Interim Action Remedial Investigation, Interim Action Sites at Fort Ord) has been revised to provide more descriptive information related to type, distribution and quantity of OE at each of the IA sites presented in Tables 2 through 4.

Comment 6: **<u>Section 4.1.1.5 History of Use, subsection (unnumbered) entitled "Ranges 43, 44, 45, 46, 47, and 48," Page 26</u>: This subsection and its bullets are somewhat loose with the nomenclature of the munitions listed as being used on the ranges. For example - what is intended by the term "4.2-inch 60mm and 81mm mortars?" Does this mean practice items only, or were HE, white phosphorous (WP), smoke, or illumination**

also intended? In addition, the term "anti-personnel mines" is used without indicating whether or not practice, HE loaded, or both were used. The term "M72 and 66mm LAW" is used, which is not the normal nomenclature used for the 66mm M72 Light Anti-tank Weapon.

If the intent is to include all or a mixture of types (HE, practice, illumination, etc.), then this should be stated. If the types are unknown, this also should be stated. Otherwise, an erroneous impression as to the hazards present may result.

Please review the subsection and revise the nomenclature to reflect the identity and the correct nomenclature of the ordnance items used on the ranges.

Response 6: Section 4.1.1.5 (History of Use, Ranges 43, 44, 45, 46, 47, and 48) has been revised to clarify the nomenclature of OE items used on the ranges as suggested.

Comment 7: **Section 4.1.3 OE-Related Information, page 31. Please include information from the recent Time-Critical Removal Action which addressed surface OE items.**

Response 7: Section 4.1.3 (OE-Related Information) has been revised to include information from the recent Time-Critical Removal Action that addressed surface OE items as suggested.

Comment 8: **Section 4.2.3.2 Summary of Field Activities Completed to Date, fourth sentence, Page 40: The projectile, 76mm, canister, listed as UXO in this sentence is inert and should not be referred to as UXO. This is also true of the listing of the item on page 19 of Table 3. If a complete round was found, it should be referred to as cartridge, 76mm, canister, M363. It would likely be an OE item (unless it was a misfire, then it should be classed as UXO) containing 5.0 pounds of M6 propellant. If it was only the projectile as stated, it contains no fuze, no tracer, and no other energetic material. Please review and correct this.**

Response 8: Section 4.2.3.2 (Summary of Field Activities Completed to Date) has been revised to clarify designation of OE items as suggested.

Comment 9: **Section 5.1.1 Current Risk from Ordnance and Explosives, second paragraph, second bullet, Page 52: The statement that "smaller items have more sensitive fuzes to ensure detonation upon contact with the target" is a somewhat dangerous generalization that should be deleted. For example, some of the more sensitive types of fuzes are the piezoelectric point initiating base detonating (PIBD) fuzes found on 105mm tank gun HEAT projectiles and 106mm recoilless rifle HEAT projectiles (sometimes referred to as "Lucky" fuzes). These fuzes are especially dangerous due to the addition of a graze sensitive (cocked striker) mechanism to the base portion of the fuze. Please remove the referenced statement from the listed bullet. A more appropriate label for this bullet might be OE type, which includes items with sensitive fuzing, HE, etc.**

In addition, suggest another bullet -- "OE Type" -- be added to this section. "OE Type" is also an important factor in determining OE risk.

Response 9: Section 5.1.1 (Current Risk from Ordnance and Explosives) has been revised to clarify the statement regarding fuzing on smaller items and another bullet has been added that describes OE type as a factor in determining OE risk as suggested.

Comment 10: **<u>Section 5.2.1.1 Imminent Threat and OE-Related Hazards, second paragraph, Page 54</u>: The reference to Title 40, Code of Federal Regulations, Part 300, Section 415, should be changed to Section 430, and the remainder of the paragraph should be deleted or rewritten to describe the early or interim action aspect of a remedial action.**

Response 10: Section 5.2.1.1 (Imminent Threat and OE-Related Hazards) has been revised to cite Section 430 of Title 40, and the remainder of the paragraph has been revised as suggested.

Comment 11: **<u>Section 6.1.1, Vegetation Clearance Alternatives, Page 60</u>: This section should consider the use of a combination of two or more of the proposed Vegetation Clearance alternatives for a specific area. For instance, because the northern portion of Ranges 43-48 is slated for future development, non-burn options are potentially viable from the HMP standpoint. This could be coupled with the burn option for the remainder of Ranges 43-48 where the HMP is more restrictive. While there may be sufficient reasons to discount the viability of a combination of alternatives within areas, these reasons are not presented in the document.**

Response 11: Please see Response to EPA General Comment 1 above. Since preparation of the Draft IA RI/FS and receipt of regulatory agency comments, the Army has reconsidered the use of mechanical clearance in specific areas and has decided to adjust the Ranges 43-48 IA site boundary to exclude an area of approximately 72 acres that is planned for future development (Sites OE-15SEA.4 and OE-15MOCO.2 in the northern portion of Ranges 43-48). A non-time critical removal action authority to cleanup OE in this area prior to implementing the interim action is under consideration. Section 6.3 (Evaluation and Comparison of Interim Action Alternatives) of the Draft IA RI/FS has been revised to include: 1) a discussion of the process used in evaluating proposed alternatives or combinations of alternatives for specific areas within each of the IA sites, and 2) the rationales for selecting single alternatives for each of the IA sites as summarized in the Response to EPA General Comment 1.

Comment 12: **<u>Section 6.1.1.2 Prescribed Burning, subsections (unnumbered) entitled "Impacts to the Public," Page 62, and "Air Emissions," Page 64</u>: Please update the status of the air emissions technical memorandum, and incorporate results into the appropriate sections of the report.**

Response 12: Section 6.1.1.2 (Prescribed Burning, Impacts to the Public, and Air Emissions) has been revised to present a summary of the results of the Air Emissions Technical Memorandum.

Comment 13: **<u>Section 6.1.2 OE Remedial Action Alternatives, Page 77</u>: Given the specific IA RI/FS objective of quickly reducing the immediate threat to trespassers, a surface clearance with institutional controls option should be presented. While there may be sufficient reasons to discount the viability of this approach, these reasons are not presented in the document.**

Response 13: Section 6.1.2.3 (Identify and Remove OE) has been revised and Appendix B (OE Depth of Remedial Action Screening) of the Draft Final report has been added to include a screening evaluation of various OE Remedial Action depths for each of the IA sites, a description of each of the OE removal depth scenarios, and the rationale for selection of

Subsurface OE Removal. In addition, please see Response to EPA General Comment 1 above regarding revisions to Section 6.3 (Evaluation and Comparison of Interim Action Alternatives) of the Draft IA RI/FS to include: 1) a discussion of the process used in evaluating proposed alternatives or combinations of alternatives for specific areas within each of the IA sites, and 2) the rationales for selecting single alternatives for each of the IA sites as summarized in the Response to EPA General Comment 1.

Comment 14: **Section 6.1.2.2 Institutional Controls, subsection (unnumbered) entitled "Existing Institutional Controls at the IA Sites," Page 81: This section discusses how administrative institutional controls would be implemented after the OE RI/FS, rather than included as additional institutional controls in the alternatives presented in the subsection entitled "Description of Additional Site-Specific Institutional Controls for Alternative Evaluation," on Page 82. In preparation of the Draft Final IA RI/FS, EPA would like to discuss this approach with the Army.**

Response 14: Section 6.1.2.2 (Institutional Controls, Existing Institutional Controls at the IA Sites) has been revised to 1) eliminate the discussion of administrative institutional controls, which will be determined in the basewide OE RI/FS.

Comment 15: **Section 6.1.2.3 Identify, Excavate, and Remove OE, second bullet on the page, Page 85: The statement "by operating detection equipment to depths of up to 4 feet below ground surface" would seem to indicate that a depth of detection limit has been established based on a distance of 4 feet below the ground surface. This leaves an unanswered question as to the final disposition of any ordnance detected below the 4 foot level and seems to conflict with the statement in the first subparagraph of Section 6.1.2.3 found on page 84. There it is stated that "Remedial Action at IA sites consists of identifying, investigating and excavating all UXO/OE found: ... 3. Below ground surface to the maximum vertical extent possible based on the capabilities of the geophysical detection equipment selected as best suited for the site conditions by the UXO expert."**

Please expand the section referenced to ensure that the process for detecting and removing UXO is better defined with respect to whether or not all suspected UXO will be removed, and whether or not any depth limitations have been established for the removal.

If anything short of removing all UXO is proposed, the feasibility of clearing to various depths (e.g., 1 foot, 2 foot, 4 foot, all), including a combination of depths within a given area, should be evaluated. For instance, the northern portion of Ranges 43-48, which is slated for future mixed use development, may require a different level of cleanup than the remainder of the area which is slated for a future habitat reserve. Also, the institutional controls required for each level of cleanup should also be considered.

Response 15: Section 6.1.2.3 (Identify and Remove OE) has been revised and Appendix B of the Draft Final report (Screening Evaluation of OE Remedial Action Depths) has been added to include a screening evaluation of various OE Remedial Action depths for each of the IA sites and a description of each of the OE removal depth scenarios, the rationale for selection of Subsurface OE Removal.

Comment 16: **<u>Section 6.1.3 OE Detonation Alternatives, Page 85</u>: Please expand the OE detonation alternatives analysis by incorporating information from the related paper recently prepared by the Army in support of SMART Team discussions.**

In addition, this section outlines two conditions that determine how OE detected visually or by instruments are to be "handled," depending upon whether or not the item contains a fuze. It divides OE into two categories: "OE Items with an Intact Fuze" and "OE Items with No Fuze". It does not discuss OE items with a damaged fuze, nor does it make any differentiation between fired items with a fuze and unfired items with a fuze which has all safety pins/devices present/unarmed. It also does not discuss unfired fuzed items in their original packing containers or portions thereof.

Please expand this section to include the detonation alternatives for the omitted categories of OE as discussed above.

Response 16: Section 6.1.3 (OE Detonation Alternatives) has been revised and Appendix B of the Draft Final report (Screening Evaluation of OE Remedial Action Depths) has been added to include a screening evaluation of various OE Remedial Action depths for each of the IA sites, a description of each of the OE removal depth scenarios, the rationale for selection of Subsurface OE Removal. In addition, the text has been revised to 1) include a summary of the OE Detonation Alternatives screening process presented in the paper prepared for internal SMART team discussions, and 2) replace the categories of "OE Items with No Fuze" and " OE Items with an Intact Fuze" with references to whether OE items are "transportable" and can safely be moved by OE personnel, or they are "non-transportable" and cannot be safely moved by OE personnel, and 3) to include citations of technical manuals that present information used in the development of the revised designations as appropriate.

Comment 17: **<u>Section 6.1.3 OE Detonation Alternatives, subsection (unnumbered) entitled "Detonation Chambers," Page 87</u>: Please contact the manufacturer of the Donovan Blast Chamber for the most up-to-date information on Chamber portability and availability, and update this section as necessary.**

Response 17: Section 6.1.3 (OE Detonation Alternatives) has been revised to include additional information on portability and availability of the Donovan Blast Chamber as suggested.

Comment 18: **<u>Section 6.1.3 OE Detonation Alternatives, subsection (unnumbered) entitled "OE Detonation Methods Retained for Further Consideration," Page 89</u>: This subsection outlines three detonation methods that are to be used to dispose of the "OE Items with No Fuze" located on the ranges. These are:**

- **No Action**
- **Detonation with Engineering Controls**
- **Detonation Chamber with Engineering Controls**

The "Offsite Destruction" method previously proposed has been eliminated due to safety concerns and other cogent reasons. The first two bullets correspond with the first two alternatives listed in Section 6.1.3, OE Detonation Alternatives, subsection (unnumbered) entitled "OE Detonation Alternatives for OE with No Fuze," and the

"Offsite Destruction," which was eliminated, corresponds with the fourth alternative in that section. However, the third bullet (Detonation Chamber with Engineering Controls) in the "OE Detonation Methods Retained for Further Consideration" subsection does not have a corresponding method in the list of original alternatives. While the narrative eventually explains that it is a combination of the original alternatives entitled "Detonation with Engineering Controls" and "Detonation Chamber," the title of the new alternative does not reflect this.

Please rename the third bullet in the above referenced subsection (unnumbered) entitled "OE Detonation Methods Retained for Further Consideration" as "Detonation with Engineering Controls and Detonation Chamber Combined," or another similar title that indicates that it is the combination of those two original alternatives. Also rename Subsection 6.1.3.3 in the same manner to better explain the fact that the new method is a combination of those two original alternatives.

Response 18: Section 6.1.3 (OE Detonation Alternatives, OE Detonation Methods Retained for Further Consideration) has been revised to clarify the components of the "Detonation with Engineering Controls" and "Detonation Chamber and Detonation with Engineering Controls Alternatives" as suggested.

Comment 19: <u>Section 6.2.2 Types of ARARs, subsection (unnumbered) entitled "Chemical-Specific ARARs," Page 93</u>: With regard to the sentence "The EPA presently considers standards ... as potential ARARs," please remove the reference to EPA and reword the sentence to identify the listed standards as typical examples of potential chemical-specific ARARs.

Response 19: Section 6.2.2 (Types of ARARs, Chemical-Specific ARARs) has been revised to clarify the listed standards are typical examples of potential chemical-specific ARARs as suggested.

Comment 20: <u>Section 6.2.3 Application of ARARs at Former Fort Ord, Page 94, and Table 5</u>: Table 5 lists potential federal and state ARARs and TBCs. This list should be expanded to include all seemingly potential ARARs and TBCs that were evaluated but determined not to be ARARS or TBCs. For instance, did you consider State hazardous waste regulations? It is appropriate to document all ARARs considered.

Response 20: Section 6.2.3 (Application of ARARs at Former Fort Ord, and Table 5) has been revised to include a listing of all potential ARARs or TBCs considered as suggested, including those identified in recent public meetings.

Comment 21: <u>Section 6.3 Evaluation and Comparison of Interim Action Alternatives, Page 94</u>: The introductory paragraph states that the alternatives are "evaluated and compared to the nine criteria", when in fact they are more generally evaluated under three headings: Effectiveness, Implementability, and Cost. Suggest this section be reworded to more clearly describe how the nine criteria are being used.

Suggest Long-Term Effectiveness and Permanence, and Reduction of Toxicity, Mobility, and Volume be included under the Effectiveness criterion and briefly discussed, even if not applicable.

Please ensure that each criteria included under the Effectiveness criterion is addressed in the detailed analysis discussions of Sections 6.3.1.1, 6.3.2.1, and 6.3.3.1.

It is understood that State acceptance of the preferred remedial alternative will not be known until the State concurs on the ROD, and that community acceptance will not be gauged until after the Proposed Plan public comment period. However, instead of stating that these criteria will not be evaluated in the IA RI/FS, it should be stated explicitly that State acceptance will be evaluated in the ROD, and that community acceptance will be determined after the Proposed Plan is submitted to the public for comment.

Response 21: Section 6.3 (Evaluation and Comparison of Interim Action Alternatives) has been revised to include an expanded discussion of the nine EPA evaluation criteria as suggested.

Comment 22: <u>Section 6.3 Evaluation and Comparison of Interim Action Alternatives, subsection (unnumbered) entitled "Cost," Page 96</u>: Before preparing the Draft Final IA RI/FS, EPA would like to discuss with the Army the approach to calculating costs for the various alternatives. For instance, since this interim action will be reevaluated in the basewide OE RI/FS and ROD just 2.5 years after the interim action ROD, should 30 years be used for certain No Action and Institutional Controls costs?

Response 22: Section 6.3 (Evaluation and Comparison of Interim Action Alternatives, Cost) and associated cost summary tables have been revised based on conducting operations and maintenance (O&M) for an interim period of 5 years until long term O&M needs are determined in the basewide OE RI/FS.

Comment 23: <u>Section 6.3.1.1 Effectiveness, Vegetation Clearance Alternatives, Page 97</u>: Is the sentence, "In addition, cutting at this site could not be conducted in compliance with the substantive elements of ARARs" accurate with respect to the northern portion of Ranges 43-48 that is slated for future mixed-use development? Does the HMP require burning in this area? If not, please adjust the language accordingly.

Response 23: Please see Response to EPA General Comment 1. Section 6.3 (Effectiveness, Vegetation Clearance Alternatives) has been revised to include a discussion of the process used in evaluating vegetation clearance methods in this area.

Comment 24: <u>Tables 6, 7, and 8</u>: As summary tables, they miss several important details. For instance, under the Effectiveness of the Prescribed Burn alternative, please add a statement indicating how smoke impacts will be minimized with mitigation. For the Mechanical and Manual Clearance alternatives, please add that they "do not comply with HMP ARAR." Please reexamine Section 6 to ensure significant elements are included in the summary tables.

Response 24: Tables 6, 7 and 8 have been revised to expand on the discussion presented in Section 6.0 as suggested.

<u>ERRATA</u>:

Comment 1: <u>Acronym List, Page ix, and Section 4.2.1.5 History of Use, first paragraph, fourth sentence, Page 38</u>: The acronym "TP," when used to describe an OE item stands for

"Target Practice." It is currently defined as "Training Practice." Please correct this.

Response 1: The Acronym List and Section 4.2.1.5 (History of Use) have been revised to correct the error as suggested.

Comment 2: **Subsection 3.1.3 Summary of Existing OE Program, last bullet on the page, Page 8: The title of the Department of Defense Explosives Safety Board (DDESB) is incorrectly recorded in this bullet. Please correct this.**

Response 2: Section 3.1.3 (Summary of Existing OE Program) has been revised to correct the error as suggested.

Comment 3: **Section 4.3.3.2 Summary of Field Activities Completed to Date, second paragraph, Page 48: At the end of the paragraph, please correct the reference from Table 2 to Table 4.**

Response 3: Section 3.1.3 (Summary of Existing OE Program) has been revised to correct the error as suggested.

Comment 4: **Section 5.3.1 Ranges 43-38, section title, Page 55: Please correct the title to read "Ranges 43-48."**

Response 4: Section 4.3.3.2 (Summary of Field Activities Completed to Date) has been revised to correct the error as suggested.

Comment 5: **Section 5.3.1 Ranges 43-38, third bullet, first sentence, Page 56: The word "of" is missing from the sentence. Please insert the word "of" between the words "quantities" and "sensitively."**

Response 5: Section 5.3.1 (Ranges 43-38) has been revised to correct the error as suggested.

Comment 6: **Section 6.1.3 OE Detonation Alternatives, Subsection 1 OE Items with an Intact Fuze, first sentence, Page 85: The term "USACE Technical Manual (TM)-60 series publication" is incorrect. It should read "U.S. Army Technical Manual (TM)-60 series publication" instead. Please correct this.**

Response 6: **Section 6.1.3** (OE Detonation Alternatives, Items with an Intact Fuze) has been revised to provide definitions of transportable and nontransportable items; the citation has been deleted from the text.

Comment 7: **Section 6.3 Evaluation and Comparison of Interim Action, Page 94: The second criteria listed (ARARs) has the word "of" where the word "or" should be. Please correct this.**

Response 7: Section 6.3 (Evaluation and Comparison of Interim Action Alternatives) has been revised to correct the error as suggested.

Comment 8: **Section 6.3 Evaluation and Comparison of Interim Action, last sentence, Page 96: Please substitute the reference to Section 6.3 with a reference to Sections 6.3.1 through 6.3.3.**

Response 8: Section 6.3 (Evaluation and Comparison of Interim Action Alternatives) has been revised as suggested.

Comment 9: **<u>Appendix A, Table of Contents, Page Ai</u>: The titles of the first two headings are incorrect. The first heading should be for Ranges 43-48, not 43-38, and the second heading should be for Range 30A, not Ranges 43-38.**

Response 9: Appendix A (Appendix C in the Draft Final report [Interim Remedial Action Alternative Cost Estimates]) has been revised to correct the error as suggested.

II. CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY, DEPARTMENT OF TOXIC SUBSTANCES CONTROL, COMMENTS DATED DECEMBER 7, 2001

General Comments:

Comment 1: ARARs:

The Department of Toxic Substance s Control (DTSC) has made the determination that Ordnance and Explosives (OE)/Unexploded Ordnance (UXO) recovered at closed, transferred and transferring ranges can be considered a hazardous waste pursuant to California Code of Regulations (CCR). As a result, treatment of OE/UXO must be performed in a manner consistent with California hazardous waste treatment requirements specified in CCR, Title 22, Division 4.5, Chapter 14, Article 16 (Miscellaneous Units). Please include the appropriate references in the ARARs.

Response 1: The Army has no objection to citing provisions of Title 22 Hazardous Waste Regulations as ARARs if OE is determined to be a hazardous waste when treated. However, the Miscellaneous Unit requirements merely provide for the issuance of permits with terms and provisions that would apply specific requirements to specific sites. Procedural requirements such as a permit do not qualify as an ARAR and will not be issued for the IA. Table 5 (ARARs) has been revised to include an evaluation of CCR, Title 22, Division 4.5, Chapter 14, Article 16 (Miscellaneous Units).

Comment 2: IA Feasibility Study

This section uses a three tiered approach to evaluate the alternatives for the different components (vegetation removal, OE remedial action, OE detonation) being considered for the interim action. The consideration of the "no action" alternatives for the three components should be combined because selection of the "no action" alternative for one component dictates the selection of "no action" for the other components. For example, if the "no action" alternative is selected as the preferred alternative for the Vegetation Clearance, then no OE remedial action and no OE detonations will occur. Or if no OE detonations will be conducted, then there is no reason to clear vegetation. Discussion of the "no action" alternative for each component is duplicative and does not add any additional information.

Response 2: The Army acknowledges consideration of No Action for each of the three different components of the Interim Action Remedial Alternatives (vegetation removal, OE remedial action, OE detonation) in Section 6.0 (IA Feasibility Study) would only be valid for certain combinations of these components. However, in order to comply with the NCP and EPA's *Guidance for Conducting Remedial Investigation/Feasibility Studies Under CERCLA* (October 1988) and provide a consistent approach to consideration and comparison of each type of alternative, the no action alternative should be included as a baseline for comparison to other alternatives.

Comment 3: Cost Estimates

Please provide the detailed rational and support for the cost estimates provided in Appendix A. Specifically, it appears that the costs for the use of the blast chamber have been overstated, and the costs for the current practices of blow in place and consolidating shots have been understated. Since ordnance clearance operations have occurred for several years now, it is suggested that the Army provide actual expenditures of funds versus number of detonations. All costs should be provided, including (but not limited to) hourly costs for UXO technicians/teams, costs for the fire department presence, brush clearance and time/materials required to perform detonation via tamping procedures.

Response 3: EPA Guidance (*A Guide to Developing and Documenting Cost Estimates During the Feasibility Study - July 2000,* (which supercedes EPA costing guidance from 1987 and the RI/FS guidance from 1988) indicates the level of detail required in FS cost estimates and provides example cost tables. The cost tables in Appendix A (Appendix C of the Draft Final report) follow these guidelines. In order to clarify the basis for these estimates (which have an accuracy of +50 percent/- 30 percent as per EPA Guidance, the tables have been revised to: 1) include a footnote indicating the cost estimates are based on Fort Ord-specific data provided by the Army's OE contractor or vendors as appropriate, 2) provide additional descriptions of the basis for the estimates, 3) update preliminarily identified detonation chamber and engineering control cost estimates in the Draft IA RI/FS (provided by the vendor of the Donovan chamber and the Army's OE contractor) based on any new cost data that is available.

Comment 4: Comparison of OE Detonation Alternatives

The comparison of OE detonation alternatives is biased toward continuation of existing blow in place practices at Fort Ord. The comparison should be revised to include a balanced discussion which includes the advantages of the blast chamber, along with detailed rationale for the cost estimate. For example, how was the length of time for the lease of a chamber estimated for each site and did the estimate account for the cost savings that can be realized because the chamber is deployable on an "as needed basis"?

Response 4: Section 6.3 (Evaluation and Comparison of Action Alternatives, Comparison of OE Detonation Alternatives) has been revised to provide: 1) a more detailed discussion of the advantages and disadvantages of each of the methods considered as suggested, and 2) updated cost and implementation information for the methods as described in Response to DTSC General Comment 3 above.

<u>Specific Comments</u>:

Comment 1: Section 1.0, Introduction, Page 1.

Please delete the latter part of the sentence in the second paragraph starting at "(2) institute temporary measures to stabilize the site and prevent further migration or degradation." This is not the objective of the IA RI/FS.

Response 1: The referenced statement is an objective of the IA RI/FS and is specifically cited in Chapter 8 of *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and*

Other Remedy Selection Decision Documents, EPA 540-R-98-031, July. The alternatives considered in the IA RI/FS do evaluate methods used to "institute temporary measures to stabilize" the IA sites (e.g., OE remedial action) and "prevent further migration or degradation," i.e., prevent potential contact with OE in locations where it could migrate (due to weather, erosion, or handling by trespassers,) or degrade (be destabilized further by weather, erosion, or be detonated by trespassers).

Comment 2: Section 4.1.3.2, Summary of Field Activities Completed To Date, Page 32.

Please discuss the most current removal action activities. Present the data and reference the specific report. This comment also applies to Sections 4.2.3.2 and 4.3.3.2.

Response 2: Sections 4.1.3.2, 4.2.3.2, and 4.3.3.2 (Summary of Field Activities Completed to Date, Ranges 43-48, Range 30A, Site OE-16) have been revised to include a summary of available data collected at the IA sites as a result of recent surface clearance activities.

Comment 3: Section 6.1.1.2, Impacts to the Public, Page 61.

The text states that "conducting a prescribed burn within the IA sites is not expected to have impacts on the public because it would include preparing and relocating affected residents during and for a period after the burn". Please revise the above statement to state that under most meteorological conditions burns have a high likelihood of having impacts to the public. Burns do impact the public due to potential health effects of smoke. Additionally, relocation of the public during and after the burn is considered an impact to the public due to the inconveniences put upon them.

Response 3: Section 6.1.1.2 (Impacts to the Public) has been revised to indicate: 1) burns may have impacts on the public under most meteorological conditions, however, development of the burn prescription would include assessment of meteorological conditions and design of the prescription to minimize impacts to the public, and 2) relocation of individuals during the burn to minimize risks would have an impact on the public in terms of the inconvenience involved.

Comment 4: Section 6.1.1.2, Accidental Detonation of UXO, Page 64.

The discussion regarding preventing public exposure due to accidental detonation of UXO during burns should include references that a Seaside -like Community Safety Plan will be prepared for both accidental detonation of UXO during prescribed burns (if this alternative is selected) and for proposed detonation activities during mitigation.

Response 4: Section 6.1.1.2 (Accidental Detonation of UXO) has been revised to indicate a community safety plan would be provided to present information regarding accidental and intentional detonation of UXO.

Comment 5: Section 6.1.2.3, Identify, Excavate, and Remove OE, page 84:

Item 3 indicates that remedial action will consist of identifying, investigating and excavating all UXO/OE found to the "maximum vertical extent possible". However,

the second bullet on page 85 sets the clearance depth at 4 feet. Please clarify if deeper items will be investigated when detected by the geophysical instruments.

Response 5: Section 6.1.2.3 (Identify and Remove OE) has been revised and Appendix B (Screening Evaluation of OE Remedial Action Depths) of the Draft Final report has been added to include a screening evaluation of various OE Remedial Action depths for each of the IA sites, a description of each of the OE removal depth scenarios, and the rationale for selection of Subsurface OE Removal.

Comment 6: Section 6.1.3, OE Detonation Alternatives, Page 85.

Please include as an attachment the most recent copy of the Evaluation of Detonation Methods for SMART Team (dated October 2001) to the IA RI/FS. This document, when final, will provides the basis for retaining or eliminating technologies for detonating UXO materials.

Response 6: Please see response to EPA Specific Comment 16 above. Section 6.1.3 (OE Detonation Alternatives) has been revised to include a summary of the OE Detonation Alternatives screening process presented in the paper prepared for internal SMART team discussions.

Comment 7: Section 6.1.3, OE Detonation Alternatives, Page 85.

The text states that, because fused UXO items are extremely dangerous and cannot be moved except under some circumstances, detonation-in-place with engineering controls is the selected alternative for all fused UXO items, and is not analyzed further in this FS. DTSC agrees that fuzed UXO items are extremely dangerous. DTSC also recognizes that any determination that ordnance and explosives (OE), including unexploded ordnance (UXO) found at the former Fort Ord, can safely be moved, can only be made on a case by case basis, and only by the appropriate Department of Defense (DOD) qualified Explosive Ordnance Disposal (EOD) technician. However, DTSC disagrees with the statement that evaluation of detonation alternatives for fuzed items should not be further analyzed in the FS.

This decision to eliminate detonation alternatives for fuzed items should be based on site specific data gathered at Fort Ord. The Fort Ord UXO database should be examined to obtain the detailed data required for the analysis in the FS. Additionally, an explanation of the apparent change in field decisions that UXO which has previously been excavated, transported, stored and consolidated for routine demolition now can only be destroyed by blow in place should be provided. Please revise the FS to consider fuzed items for further evaluation in the OE detonation alternatives.

Response 7: Please see response to EPA Specific Comment 16 above. Section 6.1.3 (OE Detonation Alternatives) has been revised to: 1) replace the categories of "OE Items with No Fuze" and " OE Items with an Intact Fuze" with references to whether OE items are "transportable" and can safely be moved by OE personnel, or they are "non-transportable" and cannot be safely moved by OE personnel, and 2) to include citations of technical manuals that present information used in the development of the revised designations.

Comment 8: Section 6.1.3, OE Detonation Alternatives, Page 85.

Please clarify which model was used to predict concentration of air pollutants for open detonation at Fort Ord. Provide references where this information can be found. In addition, please discuss if there are any data on impact to soil and groundwater that may support/oppose open detonation of UXO.

Response 8: The "Open Burn/Open Detonation Dispersion Model (OBODM)" was used to estimate concentrations of air emissions from open detonation at Fort Ord. This model was developed at the West Desert Test Center, U.S. Army Dugway Proving Ground, Dugway, Utah. It can be downloaded from the EPA modeling web site at http://www.epa.gov/ttn/scram/ under Alternative Models. The Ordnance Detonation Sampling and Analysis Plan (Detonation SAP) reviewed available studies which suggest there is little potential for soil or groundwater contamination from detonations.

Comment 9: Section 6.1.3, subsection regarding Detonation with Engineering Controls:

The text should be revised to acknowledge the potential for transport of metals and explosive residual to the soil, surface water and ground water. Additionally, this alternative should include soil and air sampling in accordance with the October 2000 Final Ordnance Detonation Sampling and Analysis Plan.

Response 9: The Basewide Remedial Investigation/Feasibility Study for Fort Ord (October, 1997) evaluated the potential for transport of metals and explosive residue to soil, surface water and groundwater from UXO detonations at Ranges 30A, 37, 43, 44, 45, 47, and 48. A total of 285 samples were analyzed for explosive compounds. Cyclotetramethylene tetranitramine (HMX) was detected in 38 samples and cyclotrimethylenetrinitramine (RDX) was detected in 21 samples. No samples exceeded the target cleanup level for HMX. Only 5 samples exceeded the target cleanup level for RDX. In addition, impacts to soil (and subsequently to surface water or groundwater) and air are proposed for investigation as described in the Final Ordnance Detonation SAP. For air, preliminary modeling results suggest the impacts would be insignificant.

Comment 10: Section 6.1.3, Detonation Chambers, Page 87.

The text states that the Donovan Blast Chamber can not be moved once it is set up and can not be moved around to different locations. This appears to be incorrect. While the manufacturer does not recommend using the blast chamber during transportation, the system is transportable. The Donovan Blast Chamber has demonstrated that it can be transported via range roads at the Massachusetts Military Reservation. Please delete references regarding the stationary nature of the blast chamber, as this is incorrect.

Response 10: Section 6.1.3 (Detonation Chambers) and other sections that discuss the use of the detonation chamber have been revised to provide additional information on its transportability.

Comment 11: Section 6.1.3, Detonation Chambers, Page 87.

The text states that approximately 90 percent of UXO items that are found at Range 30A are fuzed. Please show how these estimates were calculated.

Additionally, provide the data for the remaining IA sites. As discussed above, actual data should be used where available.

Response 11: Section 6.1.3 (Detonation Chambers) and other sections that indicate 90 percent of UXO items at the IA sites are fuzed have been revised to provide actual percentages based on data from recent surface removals. For Ranges 43-48, data from the recent Time Critical Removal Action (TCRA) for surface OE indicate of 2,457 OE items identified, 134 items (approximately 5 percent) were transportable and eligible for detonation in the chamber. For Range 30A and Site OE-16, sufficient data was not available to calculate percentages due to heavy vegetation at these sites that limited accessibility to areas containing OE.

Comment 12: Section 6.1.3, Detonation Chambers with Engineering Controls, Page 89.

Please delete references to non-fuzed UXO items being the only items that can be used in the Donovan Blast Chamber. As discussed in the above comment #7, that UXO items should not be categorized based on fuzing. The discussion should be based on actual site data.

Response 12: Please see Response to EPA Specific Comment 16 and DTSC Specific Comment 7 above. Section 6.1.3 (Detonation Chambers with Engineering Controls) and other sections that categorize UXO items by fuzing have been revised to indicate whether the items are transportable or non-transportable as described in the referenced comment.

Comment 13: Section 6.3, Evaluation and Comparison of Interim Action Alternatives, Page 95.

Please provide the rational for not evaluating the four criteria listed on page 95. Specifically discuss why the Long-Term Effectiveness and Permanence and Reduction of Toxicity, Mobility, and Volume criteria is not evaluated in the IA RI/FS.

Response 13: Section 6.3 (Evaluation and Comparison of Interim Action Alternatives) and other sections that discuss the nine EPA criteria have been expanded to include a discussion of additional criteria that can be evaluated prior to the basewide OE RI/FS.

Comment 14: Section 6.3.1.1, OE Detonation Alternatives - Effectiveness, Page 98.

The comparison of OE detonation alternatives is biased toward continuation of existing blow in place practices at Fort Ord. The comparison should be revised to include a balanced discussion which includes the advantages of the blast chamber, along with detailed rationale for the cost estimate. All six bullets describe the detonation chamber as a failure and provide no analysis of the positive impacts it provides in decreasing the costs necessary for soil, water and air sampling during open air detonation, reducing air emissions, and reducing accidental fires. Also, no analysis is provided of the negative impacts from the open air detonations.

The first bullet states that the two alternatives provide the same degree of hazard reduction and the detonation chamber could be only used for 10 percent of the UXO items. This is incorrect. The detonation chamber reduces air emissions, and physical hazards from frag, and accidental burns that open air detonation does not provide. The FS should be revised to discuss the benefits the detonation chamber provides. Additionally, the 10 percent figure used for estimating the number of

UXO items to be detonated in a chamber is minimized. Ten percent may amount to a large number of UXO items that could be detonated within the chamber to minimize the toxic emissions and physical hazardous from open air detonation. Ten percent of the number of UXO items found alone at Ranges 43-48 (to date) add up to 240 items (actual number could be greater) maybe significant by decreasing the air emissions, accidental fires, number of personnel needed for fire suppression, etc.

The second bullet states that the current method for blow in place is considered safe for detonating any type of OE found and the ranges. It may be true that the army has a good record. However, accidental fires do occur occasionally and as recently as last month. The detonation chamber may have eliminated this type of accident for certain types of OE.

The third bullet states that the chamber can only be used for UXO items that are 81mm or less in diameter and are not-fuzed. It also states that the chamber is stationary. The manufacturer of the Donovan Detonation Chamber could provide a system that handles UXO items greater that 81 mm and most UXO items at Fort Ord. Additionally, according to the manufacturer, the chamber is transportable and has been demonstrated at the range roads for the Massachusetts Military Reservation. Please revise this bullet to accurately reflect this information.

The fifth bullet states that the use of the detonation chamber requires handling, moving and storing/stockpiling of UXO which increases the safety hazards to workers. DTSC agrees that handling UXO is dangerous and should be only conducted by the DOD qualified EOD experts. However, review of literature and discussion with the manufacturer of the Donovan Detonation Chamber, indicates that preparing UXO items for consolidated blow in place should be no different than items preparing for detonation in the chamber.

The sixth bullet states that the detonation chamber is not available for purchase and only one chamber is currently available for lease. Please delete this bullet as it does not provide an argument for not using the detonation chamber. According to the manufacturer, the company is willing to bring a detonation chamber on site.

This comment also applies for Range 30A and OE site 16.

Response 14: Please see Responses to DTSC General Comments 3 and 4 and DTSC Specific Comment 7 above. The relevant sections have been revised as suggested to provide additional, updated information on the evaluation of the detonation chamber and detonation with engineering controls alternatives. Although the detonation chamber may prevent accidental fires in some instances, the majority of recent fires at Fort Ord caused by detonation activities were from detonation of nontransportable OE items that could not have been transported for detonation in a chamber.

Comment 15: Section 6.3.1.2 OE Detonation Alternatives - Implementability, Page 100.

The text states that the Detonation Chamber with Engineering Controls Alternative would be difficult to implement because it would require OE that is unsafe to move be transported to a stationary unit and be placed in the chamber. DTSC agrees that sensitive items should not be moved. However, Any UXO item capable of being moved for open air detonation should be considered for detonation in a chamber.

Please remove all language that incorrectly states that the detonation chamber is limited due to the stationary nature of the system. The chamber must remain stationary only while it is operated.

Additionally, The Department of Defense Explosive Safety Board (DDESB) has approved the use of the Donovan Chamber for detonating UXO. Over the several years, the Detonation Chamber has demonstrated it ability to be operated in a safe manner at military and private facilities.

Please revise the FS to provide a fair evaluation of the Detonation Chamber as a viable alternative for use at Fort Ord. This comment also applies for Range 30A and Site OE-16.

Response 15: Please see response to DTSC General Comments 3 and 4 and DTSC Specific Comments 7 and 10 above. The relevant sections have been revised as suggested to provide additional, updated information on the evaluation of the detonation chamber and detonation with engineering controls alternatives.

Comment 16: Section 6.3.1.3, OE Remedial Action Alternatives - Costs, Page 103.

Please provide a cost comparison for the 1 foot, 2 foot and maximum depth cleanup. Fort Ord specific data should be used in calculating the different costs. The US Army with the USA Environmental have conducted such analysis for Site OE-10A After Action Report. This information could be found in the lessons learned section (section F.1.8, page 3-13) of the Final (November 30, 2001) Grid Sampling and OE Removal Inland Range Contract Closure After Action Report.

This comment also applies for Range 30A and Site OE-16.

Response 16: Please see Response to EPA Comment Specific Comment 15 above. Section 6.1.2.3 (Identify and Remove OE) has been revised and Appendix B (Screening Evaluation of OE Remedial Action Depths) of the Draft Final report has been added to include a screening evaluation of various OE Remedial Action depths for each of the IA sites, a description of each of the OE removal depth scenarios, the rationale for selection of Subsurface OE Removal, and a description of site security measures that would be implemented in combination with OE Remedial Action at each of the IA sites.

Comment 17: Section 7.1, Ranges 43-48, OE Detonation Alternative, Page 124.

The FS selected the Detonation with Engineering Controls Alternative as the Preferred OE Detonation Alternative based comparisons made in the Evaluation and Comparison of Alternatives section. However, the Army should also be evaluating and comparing the effectiveness, implementability and costs of a combination of the two alternatives, Detonation With Engineering Controls and Detonation Chamber With Engineering Controls.

DTSC agrees that the Detonation with Engineering Controls should be the preferred alternative for UXO items that can not be moved. The movability of the item should not be categorically written off due to fuze type, but should be evaluated on a case by case basis by a qualified EOD technician.

However, DTSC believes that the IA RI/FS does not provide strong enough rationale to determine that the Detonation With Engineering Controls should be the preferred alternative for UXO items that could be moved. As discussed above, the evaluation of the Detonation Chamber with Engineering Controls should be revised and unbiased comparison with open air detonation made. Please revise the FS accordingly.

This comment applies for Range 30A and OE Site 16.

Response 17: Please see Response to EPA Specific Comment 16 and DTSC Specific Comments 7, 10, 12, and 14. The FS has been revised based on updated information on the use of the detonation chamber.

Comment 18: Appendix A.

Please show all calculations made for tabulating the cost estimates for Tables A1-A24. Provide all references and sources used.

Response 18: Please see Responses to DTSC General Comments 3 and 4 and DTSC Specific Comments 14, 16 and 17. In order to clarify the basis for these estimates (which have an accuracy of +50 percent/- 30 percent), the tables (Appendix C of the Draft Final report) have been revised to: 1) include a footnote indicating the cost estimates are based on Fort Ord-specific data provided by the Army's OE contractor and Donovan chamber vendor, 2) provide additional descriptions of the basis for individual line items in the estimates, 3) update preliminarily identified detonation chamber and engineering control cost estimates in the Draft IA RI/FS (provided by the vendor of the Donovan chamber and the Army's OE contractor) based on any new cost data that is available.

Comment 19: Appendix A, Table A6.

In addition to the costs provided for "identify, Investigate, Excavate OE to the Maximum Depth", please provide additional cost breakdowns for the depths of 1 foot and 2 foot and 4 foot (if the provided cost is not a 4 foot cost). This comment also applies for Range 30A and OE site 16.

Response 19: Please see Responses to EPA Specific Comment 15 and DTSC Specific Comment 16 above. Section 6.1.2.3 (Identify and Remove OE) has been revised and Appendix B of the Draft Final report (Screening Evaluation of OE Remedial Action Depths) has been added to include a screening evaluation of various OE Remedial Action depths for each of the IA sites, a description of each of the OE removal depth scenarios, and the rationale for selection of Subsurface OE Removal.

Comment 20: Section B2.4, Animal Grazing, Page B36.

The assumption used for evaluating animal grazing is unrealistic. The size of the fenced area (2 acres) for the number of goats (350) to be utilized is unpracticable since the workers would need to relocate the goats and the fences on a daily basis based on the rate the goats consume the plants (1.5 acres per day). It is unclear how these assumptions were made. The assumptions must be recalculated to provide a realistic scenario. Please provide all references and materials used to make these assumptions when estimating the number of goats, fenced area and grazing rate.

Response 20: Section A2.4 of Appendix A (Animal Grazing) of the Draft Final report has been revised to include additional discussion of the rationale for assuming the herd sizes based on competitive grazing practices used in the estimates. The assumed herd sizes coincide with other successful animal grazing studies; areas of larger size would allow the goats to selectively graze and have not been shown to be effective in clearing vegetation.

Comment 21: Section B2.5, Herbicide Application, Page B42.

The text is not clear as to what specific herbicides might be best used for the Interim Action site to aid in the required cleanup of the OE. Please discuss in detail the specific types of herbicide that might work best for the indented OE cleanup without long term effects on the vegetation. Provide references for types of herbicides reviewed.

Response 21: Section A2.5 of Appendix A (Herbicide Application) of the Draft Final report has been revised to include additional discussion of the types of herbicides that may be applicable for vegetation found at the IA sites.

Comment 22: Section B3.2.3, Prescribed burning, Page B53.

The text on page B53 states that pre-crushing is eliminated from further considerations as a preparation method for prescribed burning due to higher costs. However, the following page retains pre-crushing for further consideration. Please reconcile the differences. Also, provide the costs associated with pre-crushing.

Response 22: Section A3.2.3 of Appendix A (Prescribed Burning) of the Draft Final report has been revised to correct the typographical error that incorrectly indicated pre-crushing was retained for further consideration.

Comment 23: Section B3.2.4, Animal Grazing, Page B56.

Please delete the lateral part of the last paragraph of the section that discuss the production rate of goats in eliminating the shrubs and retain only the first sentence that discuss the Endangered Species Act.

Response 23: Please see Response to DTSC Specific Comment 20 above. Section A2.4 of Appendix A (Animal Grazing) of the Draft Final report has been revised to include additional discussion of the rationale for assuming the herd sizes based on competitive grazing practices used in the estimates.

III. CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY, AIR RESOURCES BOARD, COMMENTS DATED DECEMBER 7, 2001

Thank you for providing the Air Resources Board (ARB) the opportunity to review the *Draft Interim Action Ordnance and Explosive Remedial investigation Feasibility Study For Ranges 43–48, Ranges 30A, Site O~-16 Former Port Ord, California (Draft IA Rl/FS). The Draft IA RIIFS* describes the site conditions and risks posed by ordnance and explosives at specified remediation sites, and to recommend the most appropriate interim action to address explosive risks based on the criteria specified in the National Contingency Plan and U.S. EPA guidance. One of the objectives of the report is to evaluate three-tiered alternatives at each of three interim action sites for: 1) vegetation clearance; 2) ordnance and explosive remedial actions; and 3) ordnance and explosive detonations.

ARB staff has reviewed the document, focusing primarily on the vegetation clearance considerations in the report. The report considers four options for clearing vegetation: a) No action; b) Prescribed burning; c) Mechanical methods; and ci) Manual methods. The report recommends using prescribed burning as the preferred vegetation clearance method. We find that the smoke impacts analysis of this recommendation could be improved. Our specific comments are as follows:

General Comments:

Comment 1: **The report should describe how the proposed process is equivalent to California's title 17 process (California Code of Regulations).**

Response 1: The Army's proposed remedial actions will meet the procedural elements of the California Title 17 process, including: 1) preparation of an operational burn plan, 2) preparation of a smoke management plan, 3) following burn day determinations, 4) public notification of planned burn days, 5) air monitoring and 6) post burn evaluation. Additional efforts would include informing and offering support to affected residents and coordinating relocation of potentially affected residents during and for a period after the burn.

Comment 2: **The report references the need to prepare a burn prescription/burn plan outlining acceptable environmental conditions for the burn. However, the report should discuss the need for a smoke management plan similar to what is required by title 17. The report should also address the need to identify smoke sensitive areas and the prevailing meteorological conditions that would minimize smoke impacts.**

Response 2: If the final vegetation clearance alternative selected in the Record of Decision is selected as prescribed burning, the Army will prepare a Smoke Management Plan and Burn Plan that will identify smoke sensitive areas and meteorological conditions that would minimize impacts from smoke.

Comment 3: **The report should provide estimates of emissions (particulate matter and volatile organic compounds) associated with the proposed vegetation burning, address the various burn scenarios, and describe the various microclimates as well as the prevailing meteorological conditions in the area.**

Response 3: Please see Response to Air Resources Board (ARB) Comment 2 above regarding how these conditions would be considered in the referenced plans. If the final vegetation clearance alternative selected in the Record of Decision is selected as prescribed burning, the Army will estimate air emissions and provide this information in the plans.

Comment 4: Because of the complex terrain and microscale meteorological conditions in the area, it is very difficult to have large scale vegetation burning that does not cause smoke impacts on nearby populated areas. We suggest that you consider adding a requirement for a modeling study that would help to define the maximum number of acres that can be burned with little or no smoke impacts in populated areas under various meteorological conditions. This modeling should include coupled high resolution fire, meteorological, and dispersion considerations that are tuned and validated. Data collected from past burns for this area, or new data from prescribed burns in nearby Bureau of Land Management lands, could be used in the test fire modeling evaluation.

Response 4: Meetings of the working group for the Air Emissions Technical Memorandum consisting of EPA, DTSC, the Army, California Air Resources Board (ARB), and the Monterey Bay Unified Air Pollution Control District (MBUAPCD) will identify any additional modeling as necessary if prescribed burning is selected as the preferred vegetation clearance alternative in the Record of Decision.

Comment 5: The report identifies three action sites for vegetation clearance, Ranges 43-48 (555 acres). Range 30A (388 acres), and Site OE-16 (80 acres). For purposes of vegetation clearance using prescribed burning, the report is not clear if all three sites would be ignited at the same time. Furthermore, we suggest that the number of acres per burn be limited, consistent with ensuring no or minimal impact from smoke on surrounding populated areas.

Response 5: The IA sites will be burned separately if prescribed burning is selected as the preferred vegetation clearance alternative in the Record of Decision. The areas to be burned have been kept to a minimum based on the areas containing hazardous OE items and the risks related to fuel break preparation and the type of vegetation present at the IA sites.

Comment 6: If prescribed burning is conducted, the smallest plot should be ignited first as a test for how well smoke disperses under the meteorological conditions for that day. The smoke dispersal should then be compared to what was expected using dispersion models. This information can be used for assessing the smoke dispersal potential of future burns with similar meteorological conditions.

Response 6: The cleanup is prioritized based on the OE hazard. Based on the current information available, Ranges 43-48 is clearly the most hazardous. Therefore, the Army will conduct cleanup of Ranges 43-48 first, including site preparation activities such as vegetation clearance. After the first prescribed burn, the Army would analyze smoke dispersion, burn prescription and air sampling data and adjust future burns as necessary.

General Comments:

We have several other comments on the report not directly related to the analysis of the vegetation clearance alternative. We note that the Draft IA RI/FS report was

prepared in compliance with the U.S. Environmental Protection Agency (U.S. EPA) documents, *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CLRCLA: Interim Final,* October, 1988 and *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents,* July, 1999. These documents list nine criteria that agencies are to comply with when conducting a detailed evaluation of alternatives. Studies can omit complying with a criterion if the agency finds that a criterion is irrelevant to the decision. The Draft IA RI/FS evaluated the alternatives with respect to five criteria, and states that the remaining four criteria will be addressed in future documents. However, we suggest including the State Acceptance and Community Acceptance criteria in the detailed comparative analysis of alternatives prior to selection of a preferred alternative.

Response: Please see Responses to EPA Specific Comment 21 and DTSC Specific Comment 13 above. Section 6.3 (Evaluation and Comparison of Interim Action Alternatives) has been revised to include an expanded discussion of the nine EPA evaluation criteria as suggested. State and community acceptance of the alternatives will be will be evaluated during the Proposed Plan and Record of Decision process. Responses to comments on the Proposed Plan will be presented in the responsiveness summary in the Record of Decision (*EPA, 1988*).

IV. MONTEREY BAY UNIFIED AIR POLLUTION CONTROL DISTRICT, COMMENTS DATED DECEMBER 6, 2001

The purpose of this letter is to provide our District's comments on the Draft Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study for Ranges 43-48, Range 30A, Site OE-16, Former Fort Ord, California, called hereafter the Draft IA RI/FS.

General Comments:

Comment 1: **In making these comments, it is important to note that it has been this agency's longstanding position that the Army:**

- **must treat the community's concern regarding health issues as a top priority;**
- **conduct a complete and thorough analysis of the potential health impacts from the predicted air emissions from burning vegetation and ordnance; and**
- **complete a comprehensive review, including a comparison of risk, of alternatives for clearing vegetation.**

These elements are necessary to assure that the Army makes its selection of vegetation clearance methods upon a sound and informed basis.

Response 1: Please see Responses to EPA Specific Comment 21, DTSC Specific Comment 13, and California Air Resources General Comment above. Section 6.3 (Evaluation and Comparison of Interim Action Alternatives) has been revised to include an expanded discussion of the nine EPA evaluation criteria as suggested. The factors outlined in the comment are evaluated under the EPA criteria of Protection of Human Health and the Environment and are discussed in Section 5.1 (Interim Remedial Action Objectives).

Unless otherwise specified, the section and page numbers refer to the Draft IA RI/FS.

Specific Comments:

Comment 1: **Section 3.2.4, p. 15: As we previously have commented, this section (or some other section) of this document must include a description of the specific meteorological and topological features that could lead to difficulties with using the various alternatives. Section 6: Why were combinations of treatments that could reduce fuel loading before prescribed burning not considered among the alternatives? In addition, there are a variety of biotic environments, such as grasslands, included in the areas covered by this IA RI/FS, yet all are treated the same, i.e., as Coastal Maritime Chaparral. These environments present very different considerations relative to vegetation clearing options.**

Response 1: Please see: 1) Response to EPA General Comment 1 regarding revisions to Section 6.3 (Evaluation and Comparison of Alternatives) to clarify the process used in evaluating vegetation clearance alternatives in different areas within the IA sites, and 2) California Air Resources Board (ARB) Comments 2, 3, 4 and 6 regarding meteorological conditions that will be considered if prescribed burning is selected as the preferred alternative in the

Record of Decision. The Burn Plan will contain an evaluation and description of site-specific meteorological conditions based on local historical data and data from the weather stations at Fort Ord.

Comment 2: Section 6: Comparison of potential risk to the public for the various alternatives must be included.

Response 2: Please see Response to General Comment 1, EPA Specific Comment 21, DTSC Specific Comment 13, and California Air Resources General Comment above. Section 6.3 (Evaluation and Comparison of Interim Action Alternatives) has been revised to include an expanded discussion of the nine EPA evaluation criteria as suggested. The factors outlined in the comments are evaluated under the EPA criteria of Protection of Human Health and the Environment and are discussed in Section 5.1 (Interim Remedial Action Objectives).

Comment 3: Section 6.1.1.2, p.62-63: Details of the burn prescription must be discussed. At a minimum, the detailed criteria that will be used to develop the prescription must be discussed.

Response 3: Section 6.1.1.2 (Vegetation Clearance Alternatives, Prescribed Burning) has been revised to include a general description of how the burn prescription would be developed. Specific details of the burn prescription will be determined in the Operational Burn Plan. The burn prescription will be developed by a fire behavior specialist and a fire weather forecast meteorologist. Historical meteorological data, predictive modeling, past fire/smoke behavior are examples of information to be considered when developing the burn prescription.

Comment 4: Section 6.1.1.2, p. 63: There is no discussion of claims that OE are destabilized by high temperatures from prescribed burning. Is there an increased risk of accidental detonation after clearance by burning?

Response 4: The Army acknowledges that OE items that may have been exposed to fire could be extremely dangerous because chemical and physical changes may have occurred that may have rendered the item more sensitive than in its original state (U.S. Army Corps of Engineers EP 385-1-95a). OE safety-related documents to be prepared for the IA sites will address the potential destabilization of OE from fire.

Comment 5: Section 6.1.1.2, p.64: The report needs specific analysis of the air emissions and the likelihood of their causing health and environmental effects.

Response 5: Please see Response to Comment 4 above, and specifically the Response to ARB Comment 3 above, which states that if the final vegetation clearance alternative selected in the Record of Decision is selected as prescribed burning, the Army will estimate air emissions and provide this information in the Burn Plan and Smoke Management Plan. In addition, Section 6.1.1.2 (Prescribed Burning, Impacts to the Public, and Air Emissions) has been revised to present a summary of the results of the Air Emissions Technical Memorandum for Fort Ord.

Comment 6: **Section 6.1.1.2, p. 65: The adverse impacts on the environment from burning vegetation emissions are not included. A discussion of the history and risk of escaped fires or wildfires has not been included.**

Response 6: Section 6.1.1.2 (Vegetation Clearance Alternatives, Prescribed Burning) has been revised to include a discussion of potential impacts on the environment from burning vegetation, including a history of escaped fires or wildfires.

Comment 7: **Section 6.1.1.2, p. 65: There are a variety of biotic environments, such as grasslands, included in the areas covered by this IA RI/FS, yet all are treated the same, i.e., as Coastal Maritime Chaparral. These present very different considerations relative to vegetation clearance options available.**

Response 7: Please see Response to EPA General Comment 1. Sections 6.1.1 (Vegetation Clearance Alternatives) and 6.3 (Evaluation and Comparison of Interim Action Alternatives) of the Draft IA RI/FS have been revised to include: 1) a discussion of the process used in evaluating proposed alternatives or combinations of alternatives for specific areas within each of the IA sites, and 2) the rationales for selecting single alternatives for each of the IA sites as summarized in the Response to EPA General Comment 1.

Comment 8: **Section 6.2.2, p. 92: Ambient air quality standards for criteria pollutants and standards for toxic air contaminants must be included in the ARARs.**

Response 8: The Army has evaluated ambient air quality standards and has concluded those standards are not an ARAR. As ambient standards, the extent of contribution, if any, of IA activities to meeting or exceeding the standards' concentrations versus the contributions of area or regional sources cannot be determined. 17 CCR 70101 states that the standards "provide a basis for preventing or abating the effects of air pollution." The standards themselves do not apply to individual sources.

Comment 9: **Table 5: federal and State Clean Air Act ambient air quality standards for criteria pollutants, and exposure standards for toxic air contaminants must be included among the ARARs listed in the table.**

Response 9: Please see Response to MBUAPCD Comment 8 above.

Comment 10: **Table 6: Include an analysis/comparison of risk and safety (public health) as a column.**

Response 10: Please see Responses to MBUAPCD General Comment 1 and Specific Comment 2, EPA Specific Comment 21, DTSC Specific Comment 13, and California Air Resources General Comment above. Section 6.3 (Evaluation and Comparison of Interim Action Alternatives) has been revised to include an expanded discussion of the nine EPA evaluation criteria as suggested. The factors outlined in the comment are evaluated under the EPA criteria of Protection of Human Health and the Environment and are discussed in Section 5.1 (Interim Remedial Action Objectives).

Thank you for providing this opportunity to comment on the Draft IA RI/FS. If you require further details on our comments, please contact Amy Taketomo at our District offices.

V. UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE, COMMENTS DATED DECEMBER 4, 2001

We have reviewed the subject document, dated October 23, 2001, which we received on October 29, 2001. As the Federal agency responsible for administering the Endangered Species Act of 1973, as amended (Act), and conserving and protecting the Nation's fish and wildlife resources we have been working with the Army on wildlife issues associated with the closure and reuse of Fort Ord for many years. We have the following comments on the subject document:

General Comments:

Comment 1: **The evaluation of alternative vegetation clearance methods and their impacts to protected and other natural resources would be enhanced by citing published research on the effects of fire on chaparral vegetation. The document does discuss the value of fire for the regeneration of endangered, threatened, and special status plant species on former Fort Ord and cites monitoring results from Fort Ord. Having site- and species-specific information is extremely valuable, however there is also abundant published research on the effects of fire on non-sprouting chaparral plant species. The Introduction indicates that a literature review is planned as part of the larger Ordnance and Explosives Remedial Investigation/Feasibility Study. A review of published research would lend further substance to the evaluation in this document, as well. We cited numerous sources on the topic in our April 24, 2000, response to your draft Trends Evaluation.**

Response 1: Section A3.2.3 of Appendix A of the Draft Final report contains an evaluation of prescribed burning based on Fort Ord -specific and wider research sources as noted in the references. As noted in the comment, the Army is conducting a literature review of vegetation clearance methods as part of the basewide Ordnance and Explosives Remedial Investigation/Feasibility Study (basewide OE RI/FS).

Comment 2: **The U. S. Fish and Wildlife Service (Service) supports prescribed burning as the Preferred Vegetation Clearance Alternative. We do not know of any method of vegetation clearance for former Fort Ord other than those that involve prescribed fire, that can meet the goals of the 1997 Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California (HMP) and allow the continued survival and recovery of HMP species. However, the subject document states that, in relation to mechanical and annual clearance "....USFWS would not allow its use on a large scale...." (pp 6-99, 6-108, 6-116). This and similar statements need clarification. As a federal agency, the Army is required, under section 7(a)(2) of the Act, to consult with the Service when its actions may affect listed species. The Army has consulted with the Service on the closure and reuse of former Fort Ord. The HMP describes the Army's activities, including minimization and monitoring measures proposed as part of the Army's action. If the Army's action is subsequently modified in a manner that causes an effect to a listed species or critical habitat that was not considered in the biological and conference opinion, then the regulations which implement section 7(a)(2) of the Act (50 CFR. 402.16) require that the Army reinitiate consultation. Consequently, it is not correct to indicate that the Service will "...not allow..." the Army to carry out certain activities. The Army**

must comply with the Act, including avoiding jeopardizing threatened or endangered species.

Response 2: Section 6.3 (Evaluation and Comparison of Interim Action Alternatives) has been revised to clarify the statement regarding USFWS requirements on the use of other vegetation clearance methods besides burning in areas containing listed species.

Comment 3: As you progress in your evaluation, please provide us with additional information on activities associated with your preferred clearance method, prescribed burning. This document specifically mentions the use of fire-suppressant foam and pre-treatments to vegetated areas. In the Screening Evaluation, Appendix B, you do not cite any research on the effects of the Crushing pre-treatment on vegetation regeneration following a prescribed burn. Additionally, although you eliminated the herbicide application ("Browning") pre-treatment from further consideration, the document is unclear in relation to the Crushing pre-treatment. It appears to be eliminated from further consideration on page B53, but is retained for further consideration on page B55.

Response 3: Appendix A (Screening of Vegetation Clearance Methods) of the Draft Final report has been revised to: 1) clarify the rationale used in the selection or elimination of the methods cited from further consideration, and 2) correct the typographical error that indicated pre-crushing was retained for further consideration.

Comment 4: Page 3 - 16, second paragraph, sixth line, incorrectly identifies the name of our agency.

Response 4: Appendix A (Screening of Vegetation Clearance Methods) of the Draft Final report has been revised to correct the error in the name of your agency.

This concludes our comments on this draft document. We appreciate the opportunity to work with you on the revise and closure of the former Fort Ord If you have any questions, please call Diane Steeck, of my staff at (805) 644-1 766.

VI. ROBERT HALE, MONTEREY, CALIFORNIA, COMMENTS DATED DECEMBER 4, 2001

I have the following comments I would like the Army to address in the current Draft IA OE RI/FS.

General Comments:

Comment 1: The potential adverse impacts on long-term health of rare plants and maritime chaparral must be fully studied and documented for all the alternatives to prescribed burning.

Response 1: Please see Responses to EPA Specific Comment 21, DTSC Specific Comment 13, California Air Resources General Comment, and MBUAPCD General Comment 1 above. Section 6.3 (Evaluation and Comparison of Interim Action Alternatives) has been revised to include an expanded discussion of the nine EPA evaluation criteria as suggested. The factors outlined in the comment are evaluated under the EPA criteria of Protection of Human Health and the Environment and are discussed in Section 5.1 (Interim Remedial Action Objectives).

Comment 2: The Army should thoroughly examine other research studies on the role of fire in maintaining chaparral plant community diversity. Include this scientific support for burning in the Draft IA.

Response 2: Please see Response to U.S. Fish and Wildlife Service Comment 1 above. Section A3.2.3 of Appendix A contains an evaluation of prescribed burning based on Fort Ord - specific and wider research sources as noted in the references. As noted in the comment, the Army is conducting a literature review of vegetation clearance methods as part of the Basewide Ordnance and Explosives Remedial Investigation/Feasibility Study (basewide OE RI/FS).

Comment 3: A prime objective of the Draft IA RI/FS should be to find the safest way to burn chaparral. Analyze various scenarios of weather and time of year, etc. for best burning conditions.

Response 3: Please see Response to California Air Resources Board Comment 2 above regarding how these conditions would be considered in the referenced plans. If the final vegetation clearance alternative selected in the Record of Decision is selected as prescribed burning, the Army will estimate air emissions and provide this information in the plans.

I support the use of burning of chaparral for OE removal.

VII. STATE OF CALIFORNIA, DEPARTMENT OF FISH AND GAME, MONTEREY, CALIFORNIA, COMMENTS DATED DECEMBER 13, 2001

The California Department of Fish and Game (DFG) received the "Draft Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study (Draft IA RI/FS) for Ranges 43-48, Range 30A, Site OE-16, Former Fort Ord, California (October 23, 2001)" on October 30, 2001. This document was prepared by Harding ESE, Inc. for the Department of the Army. DFG appreciates the Army's request of November 6, 2001 to provide a review of this document.

Background:

The former Fort Ord is located near Monterey Bay in northwestern Monterey County, California. Since 1917, portions of the former Fort Ord have been used by the military for maneuvers, target ranges, and other purposes. A wide variety of conventional unexploded ordnance (UXO) items have been located at sites throughout the former Fort Ord, including pyrotechniques and explosives. The purpose of this "Interim Action Remedial Investigation/Feasibility Study" (IA RI/FS) is to address ordnance and explosives (OE) in order to: (1) take quick action to protect human health and the environment from an imminent threat in the short term while a final remedial solution is being developed and (2) institute temporary measures to stabilize the site and prevent further migration or degradation.

The U.S. Army, as the lead agency, has determined that an interim action is appropriate to protect human health from the imminent threat posed by OE at Ranges 43-48, Range 30A and Site OE-16 (see 1.0 Introduction – 2). Although the stated purpose of this Interim Action is predominantly to protect human health, the RI/FS will consider potential residual OE-related risks (see 2.0 Purpose and Objectives – 5) to human health (and the environment). The primary purposes for developing Interim Remedial Action Objectives (RAOs) are to reduce risks to human health and the environment associated with OE (see 5.0 Selection of IA Sites – 52).

<u>Comment and Recommendations on the Draft IA RI/FS</u>:

Department of Fish and Game has reviewed subject report. There are several deficiencies in the Draft Report with respect to interests and natural resource trust responsibilities of Department of Fish and Game in the following areas: a) Adequacy of the Ecological Risk Assessment; b) Assessment of the Effects of the RA on Fish and Wildlife Resources; and c) Consideration of State Applicable or Relevant and Appropriate Requirements (ARARs).

Comment 1: <u>Adequacy of Ecological Risk Assessment (risk to the Environment)</u>

The IA RI/FS does not provide an analysis or evaluation of the potential risk to environmental receptors from the proposed actions. There are two elements of the risk assessment analysis (see US EPA non Time Critical Removal Risk guidance – http://tis.eh.doe.gov/oepa/guidance/cercla/critic.pdf) that should be considered in the final report: 1) catastrophic explosions with risk to fish and wildlife resources; and b) potential hazardous waste release(s) from unexploded and exploded ordnance. The report correctly identifies that the lead agency (Army) may take any appropriate action to abate, prevent, minimize, stabilize, mitigate, or eliminate the release or the threat of release. Factors that are to be considered in taking action include threat of fire or explosion and action or potential exposure to human

populations, animals, or the food chain from hazardous substances, pollutants, or contaminants, and other factors (see 5.0 Selection of IA Sites – 55). The draft report did not do this evaluation or make this analysis of risk by these potential threats. The final report should include such an assessment.

Response 1: The Interim Remedial Actions proposed by the Army will not be conducted as Non-Time Critical Removals, and therefore the cited guidance is not applicable to the actions proposed in the Draft IA RI/FS. Ecological risks will be evaluated in the basewide OE RI/FS currently under preparation.

Comment 2: **Assessment of the Effects of the Remedial Action on Fish and Wildlife Resources**

An analysis of the impacts, effects, and their avoidance (i.e., mitigation) for the Interim Action alternatives (including No Action) should be included in the Final Report (see 6.0 IA Feasibility Study – 59). This analysis should address fish, wildlife resources and biota, including their habitats.

Response 2: Please see Response to Comment 2 above regarding ecological (fish and wildlife) risk assessment that will be performed in the basewide OE RI/FS. Mitigation measures described in Chapter 3 of the HMP will be implemented to minimize impacts to fish and wildlife resources.

Comment 3: **Consideration of State Applicable or Relevant and Appropriate Requirements (ARARs)**

The attachment lists the State ARARs for State natural trust resources that are relevant to the IA sites. They should be listed and included in Table 5 (see 6.0 IA Feasibility Study – 94).

Response 3: The Army appreciates the DFG's submittal of recommended ARARs. The proposed ARARs cited have been evaluated for their applicability to the Interim Action and have been included in the appropriate sections of Table 5.

Conclusion:

DFG would like to reiterate our interest in coordinating any natural resource issues should there be any activity at Fort Ord that could affect the State's natural resources. In addition, because the habitat contains protected species at these IA site, DFG would like to see the detailed resource management measures detailed in the Installation-Wide Multispecies Habitat Management Plan (USACE, 1997) be followed. DFG would like to receive a response to the above comments and see these comments addressed in the next revision of this IA RI/FS. We appreciate the opportunity to comment on this review request and look forward to working with you in the future. If you have any questions regarding this review or require further details, please contact me by telephone at (831) 649-2876 or via e-mail: pvelez@ospr**. Dfg.ca.gov.**

APPENDIX E

RESPONSES TO COMMENTS ON THE DRAFT FINAL INTERIM ACTION ORDNANCE AND EXPLOSIVES REMEDIAL INVESTIGATION/FEASIBILITY STUDY FOR RANGES 43-48, RANGE 30A, SITE OE-16, FORMER FORT ORD, CALIFORNIA, JANUARY 18, 2002

RESPONSES TO COMMENTS ON THE DRAFT FINAL INTERIM ACTION ORDNANCE AND EXPLOSIVES REMEDIAL INVESTIGATION/FEASIBILITY STUDY FOR RANGES 43-48, RANGE 30A, SITE OE-16, FORMER FORT ORD, CALIFORNIA, JANUARY 18, 2002

I. REGULATORY AGENCY COMMENTS

IA. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, REGION IX COMMENTS DATED FEBRUARY 15, 2002

Comment 1: **In reviewing the comments found in Appendix D that were provided by the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC), it was noted that Specific Comment 7 took issue with the premise that all fuzed Ordnance and Explosives (OE) items must be destroyed in place. In addition, Specific Comment 12 contained a statement that "UXO items should not be categorized based on fuzing." Also, in Specific Comment 17, the statement is made that "The movability of an item should not be categorically written off due to fuze type, but should be evaluated on a case by case basis by a qualified EOD technician."**

The responses provided to the referenced DTSC comments changed the OE detonation alternative categories from "OE Items with an Intact Fuze" and "OE Items with No Fuze" to "Nontransportable OE Items" and "Transportable OE Items," respectively, in Section 6.1.3 (OE Detonation Alternatives) of the document. While this removes the "fuze-no fuze" issue from the document, it does not specifically state how the contractor will determine what can and cannot be moved (transported). Also, the response to DTSC Specific Comment 7 indicates that Section 6.1.3 will be revised to "include citations of the technical manuals that present information used in the development of the revised designations." However, no such citations were provided in the revised Section 6.1.3.

Please revise the document to include a detailed discussion and/or diagram of the methodology used by the COE and its contractors to determine whether or not an item of OE may be moved prior to disposal. If this information is provided in one or more published documents, please provide a citation for each document, and reference them in the revision.

Response 1: The Army agrees that criteria for determining whether an OE item is "transportable" or non-transportable" should be described as clearly and thoroughly as possible. The Army recognizes that fuzing is one of the most decisive factors in making such a determination. However, definitions and discussions of transportable and non-transportable OE items presented in the IA RI/FS are intended to supplement detonation alternatives analysis and are not intended to guide field activities. Because the decision to move or not to move an OE item will be made in the field on a case-by-case basis by the UXO Safety Specialist, it is best to describe the details of the decision process in the site-specific work plan(s) that will be jointly developed by the OE contractor and the UXO Safety Specialist.

Reference to technical manuals such as EP-385-1-92a, the TM60 series, and applicable Ordnance Data Sheets had been included in the Glossary for the "transportable" and "non-transportable" definitions in lieu of revising Section 6.1.3.

Comment 2: **EPA Errata Comment 1 on Page D-11 reads as follows: "Acronym List, Page ix, and Section 4.2.1.5 History of Use, first paragraph, fourth sentence, Page 38: The acronym "TP," when used to describe an OE item stands for "Target Practice." It is defined as "Training Practice" in the Acronym List in the study. Please correct this."**

Response 2: The acronym "TP" has been used historically for both the terms "training practice" and "target practice". In the future, the definition will be clarified as "target practice" where appropriate.

Comment 3: **Section 6.3.1.3.2, OE Remedial Action Alternatives, O&M Costs, page 63, and in similar discussions throughout the document. This subsection states that "The subsurface OE Removal Alternatives has no associated O&M costs." It is quite possible certain O&M costs may be necessary -- at least until the Basewide OE RI/FS determines otherwise. Please factor in some reasonably anticipated O&M requirements.**

Response 3: The following three OE Remedial Action Alternatives were evaluated for each of the three IA sites (Ranges 43-48, Range 30A, and Site OE-16): *No Action with Existing Site Security Measures, Enhanced Site Security Measures, and Identify and Remove OE (Subsurface OE Removal).* Because the first two alternatives do not take action to remove OE and instead focus on maintaining or enhancing controls to minimize OE-related hazards while the basewide OE RI/FS is being conducted, operations and maintenance (O&M) costs were estimated for implementation of these controls. The preliminarily identified preferred alternative, *Subsurface OE Removal*, takes action to remove surface and subsurface OE at the sites; therefore, additional controls (and associated O&M of these controls) would not be required as with the other alternatives evaluated. Costs associated with maintaining site controls during subsurface OE removal and restoring these controls after work is completed were included in the capital cost estimates.

Comment 4: **Table 5 - ARARs:- Page 1 of 11: Reference to RCRA needs to address both Munitions Rule and other RCRA statutory and regulations. For the Munitions Rule, while it is correct to say that it is not applicable, it may well be relevant and appropriate for certain elements of the proposed action. There may also be other RCRA standards which should be evaluated as relevant and appropriate as well (e.g. Land Disposal Restrictions).**

Response: The Munitions Rule is not applicable; however, it will be evaluated to determine whether it is relevant and appropriate with respect to the proposed remedial alternative.

Comment: **Page 2 of 11: Clean Water Act, 404b1 ..... On one hand it says it's not an ARAR, but on the other it says if OE is encountered in wetlands, the regulations will be followed. Suggest identifying it as a location-specific ARAR, but that wetlands are not expected. However, if wetlands are encountered, will follow substantive provisions of ARAR.**

Response: The Army feels that the Clean Water Act, 404 (b)(1) is not an ARAR because it consists of non-substantive procedural and administrative requirements with which the Army, under CERCLA, is not required to comply.

Comment: Page 3 of 11: Cal Clean Air Act, MBUAPCD Rule 407. The description and remarks sections need to be revised to correctly distinguish between substantive and procedural requirements of these rules. While a permit is not required, the Army must demonstrate that it is achieving the substantive standards. Also, it's not really accurate to say the non-substantive procedural and administrative provisions do not qualify as ARARs. Suggest: "Contains non-substantive procedural and administrative provisions which, under CERCLA, the Army is not required to comply with." Please adjust where similar language is used in Table 5.

Response: Comment accepted. The citation within Table 5 has been changed to reflect suggested language.

Comment: Page 4 of 11: Cal HSC Title 22. Discussion needs to reflect that the first obligation is to determine if waste "generated", either by picking up OE or by preparing to blow it in place, is hazardous. Then determine appropriate management requirements.

Response: Comment accepted. The remarks section will be modified to reflect that the standard would become applicable to the management of the material if the material is determined to be hazardous pursuant to the regulation.

Comment: Page 7 of 11: Cal Fish and Game 1900, etc. Even if Army is correct that they are not a "person", this could be relevant and appropriate. This "person" approach is used several times. Please reconsider.

Response: Comment accepted. Table 5 has been changed to reflect that, although the definition of "person" in the statute does not include the Army, the standards of control may be relevant and appropriate, and the citation is therefore considered an ARAR.

Comment: Page 9 of 11: Cal Clean Air Act, Title 17 CCR 80100. It seems this should be treated the same as EPA Policy on Wildland and Prescribed Burns with regard to substantive aspects of smoke management plans.

Response: The regulations are considered relevant and appropriate. The Army will comply with substantive elements of the regulations. Under CERCLA, the Army is not required to comply with procedural and administrative provisions; however those elements will be addressed as part of the interim remedial design/remedial action process.

Comment: Page 9 of 11: Cal Clean Air Act 41800. Please clarify or eliminate statement that action will be conducted in a manner such that waste will not be burned.

Response: Table 5 has been modified to reflect that the intent of prescribed burning within the context of the IA is to remove vegetation and not to burn waste.

Comment 5: Table B3, p. 3 of 3. Interim Action Costs, OE Detonation. Drop the "million" next to "13,000 million".

Response 5: Comment accepted. Text has been changed to delete "million"

IB. CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY, DEPARTMENT OF TOXIC SUBSTANCES CONTROL COMMENTS DATED FEBRUARY 15, 2002

Thank you for providing the Department of Toxic Substances Control (DTSC) with the Draft Final Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study for Ranges 43-48, Range 30A, and Site OE-16 for our review. The document was prepared by Harding ESE for the United States Army Corps of Engineers on behalf of the United States Army at Fort Ord. Our comments are as follows:

Comment 1: **Appendix D, Response to Comments;**

Previous DTSC General Comment #1: The Department of Toxic Substances Control (DTSC) has made the determination that Ordnance and Explosives (OE)/Unexploded Ordnance (UXO) recovered at closed, transferred and transferring ranges can be considered a hazardous waste pursuant to California Code of Regulations (CCR). As a result, treatment of OE/UXO must be performed in a manner consistent with California hazardous waste treatment requirements specified in CCR, Title 22, Division 4.5, Chapter 14, Article 16 (Miscellaneous Units). Please include the appropriate references in the ARARs.

Army's Response: The Army has no objection to citing provisions of Title 22 Hazardous Waste Regulations as ARARs if OE is determined to be a hazardous waste when treated. However, the Miscellaneous Unit Requirements merely provide for the issuance of permits with terms and provisions that would apply specific requirements to specific sites. Procedural requirements such as a permit do not qualify as an ARAR and will not be issued for the IA Table 5 (ARARs) has been revised to include an evaluation of CCR, Title 22, Division 4.5, Chapter 14, Article 16 (Miscellaneous Units).

DTSC Response: DTSC agrees that a Resource and Conservation Recovery Act (RCRA) permit will not be required for the IA. However, the substantive requirements of Title 22, Division 4.5, Chapter 14, Article 16 must be followed.

Response 1: The only substantive requirement of RCRA Subpart X and corresponding state regulation, California Code of Regulations Title 22, Section 66264.600 et seq., is that open detonation be conducted in a manner protective of human health and the environment. This is one of the nine criteria that was specified in the U.S. Environmental Protection Agency's *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA 1988) (RI/FS/ Guidance) and was evaluated in the IA RI/FS.

Comment 2: **Section 6.1.3, OE Detonation Alternatives, Detonation Chambers, Page 52. Please delete the last sentence of this section starting with the word "because…". The sentence inaccurately states that the OE items would have to be transported over hundreds of acres.**

Response 2: Comment accepted. Text has been changed to delete text as recommended.

Comment 3: **Sections 6.3.1.3.2, 6.3.2.3.2, and 6.3.3.3.2. The costs for the remedial action alternatives (surface and subsurface removal) do not include long term Operation and Maintenance (O&M) costs. Since the reuse and the ultimate cleanup level (depth) is not clear at this time, it should be noted that O&M costs associated for long term management of the site may be incurred.**

Response 3: The following three OE Remedial Action Alternatives were evaluated for each of the three IA sites (Ranges 43-48, Range 30A, and Site OE-16): *No Action with Existing Site Security Measures, Enhanced Site Security Measures, and Identify and Remove OE (Subsurface OE Removal).* Because the first two alternatives do not take action to remove OE and instead focus on maintaining or enhancing controls to minimize OE-related hazards while the basewide OE RI/FS is being conducted, operations and maintenance (O&M) costs were estimated for implementation of these controls. The preliminarily identified preferred alternative, *Subsurface OE Removal*, takes action to remove surface and subsurface OE at the sites; therefore, additional controls (and associated O&M of these controls) would not be required as with the other alternatives evaluated. Costs associated with maintaining site controls during subsurface OE removal and restoring these controls after work is completed were included in the capital cost estimates.

Comment 4: **Tables 2-4 in Appendix. The tables in the Appendix listing OE/UXO found at each of the three IA sites need to be checked. According to the tables, the only items found were either OE Scrap or UXO. No OE was found. Table 4 (OE-16) also uses slightly different terminology than either Table 2 (Ranges 43-48) or Table 3 (Range 30A).**

Response 4: The information in Table 4, OE-16, UXO and OE Scrap Discovered During Investigations, is correct. In this table, entries "FALSE," "OES-E (Scrap, Expended)" and "OE Scrap" indicate that the item(s) was an OE scrap. Entries "TRUE," "UXO" and "UXO (live)" indicate that the item(s) was unexploded ordnance.

II. COMMENTS FROM OTHER ORGANIZATIONS AND THE PUBLIC

IIA. COMMENTS FROM MIKE WEAVER, CHAIR, THE HIGHWAY 68 COALITION, BOARD MEMBER, MONTEREY BAY TOXICS PROJECT, DATED FEBRUARY 18, 2002

FOR THE ADMINISTRATIVE RECORD

In my mailbox on February 16, 2002 was your letter postmarked February 15, 2002. Your letter states that you are denying my written request for a 30-day review extension. I handed you a written request for a 30-day extension on February 6, 2002. This was the same evening that I received the correct (Draft Final) copy of the above referenced study document.

Thanks to California DTSC, I was able to obtain the correct (Draft Final) copy on the evening of February 6, 2002. Your letter to me states that this allows me about two weeks (12 days) to review this extensive and important document. You then encourage me in the next sentence to comment on it (by February 18, 2002).

You are well aware of the Fort Ord Superfund Technical Assistance Grant (TAG), and you know we have community Technical Advisors (TA's) whose function it is to assist community members with reviewing and commenting on the Army's Superfund cleanup documents, such as this one.

You know you have only recently agreed to release this Draft Final, Interim Action RI/FS for Ordnance and Explosives to the TAG Advisors. Furthermore, you know that TAG TA's have not received this document, DESPITE the fact that it has been the subject of ongoing requests for over half of a year. TAG Advisors and community members are eager to read this document, review it, and comment on it, IF given the opportunity.

However, you are closing off the public's ability to review and comment on this very important document. Yet, in the same letter, you state that people can also make comments on the RI/FS during the required public comment period, which will begin in mid-March and end in mid-April as part of the Proposed Plan. You seem to be deliberately manipulating and diminishing the public's ability to have early and meaningful participation in the Fort Ord Superfund cleanup process. As you are aware the Army is required to do a base wide Ordnance and Explosives RI/FS. What I see here is a further attempt to piecemeal that regulatory requirement.

You are, in essence:

1) **Preventing substantive review**

2) **Preventing early and meaningful participation in the process**

3) **Excluding public participation**

4) **Attempting to "jam" the public through the process**

5) **Stifling serious concerns**

I request that you reconsider your shutting the door on the request for an additional 30 days. (We would like 30 days!) Those of us who are lifelong neighbors of former Fort Ord wish better consideration than the seemingly callous treatment we have been receiving at the hands of the Army, Environmental and Resources Management Department.

In the interim, and while awaiting your reconsideration, I would like to offer the following. This is after a very preliminary skimming of the above referenced document. California DTSC was kind enough to suggest areas of the document that seem to pertain to the meat of the matter.

Response: We have responded to your request in a letter dated February 13, 2002. The close of the review period for the document was February 18th, about two weeks from the day you received it. In addition, people can also make comments on the IA RI/FS during the required public comment period, beginning on March 12, 2002 and ending on April 11, 2002, when the Proposed Plan for this action is available. With the time available during the public comment period, we will not extend the comment period on the Draft Final IA RI/FS. We encourage you, however, to comment on the document as soon as possible.

Comment 1: **To begin with, the priorities for selecting these particular three areas are unclear. We are all concerned about safety. The entire base is a concern. However, the selection of these three areas over others is not clearly spelled out. The areas are approximately one-half mile to one mile from areas considered populated. They are fenced and patrolled. An analysis and explanation for why the area immediately next to the City of Seaside was not chosen would be a start. An explanation regarding potential new future land uses nearby would also be helpful in this document. The Interim Action proposes to spend millions of dollars of taxpayer money on an interim clean up. The specific reasons are not clear. After all small children from the City of Seaside are more likely to play closer to home than further away.**

You may remember my concerns when an area sort of near the town of Del Rey Oaks was chosen for a "non-time critical" clean up. After spending millions of dollars of taxpayer money, the Army changed the nomenclature to a "time-critical" clean up. The area where all the money was spent is proposed for an 18-hole golf course, a 360 plus room hotel, and a conference center. My question about who benefited, the public's safety or the developer, has never been answered.

Response 1: The Army acknowledges your concerns regarding the prioritization and selection process for ordnance and explosives (OE) clean up at the former Fort Ord (Fort Ord). As described in Section 2.0 (Purpose and Objectives) of the Interim Action OE RI/FS (IA OE RI/FS), the Army is conducting the basewide OE RI/FS which includes a comprehensive evaluation of the need for OE clean up for all property at Fort Ord. While the basewide OE RI/FS is being conducted, remedial actions at the IA sites are being evaluated on an interim basis because the basewide OE RI/FS will not be completed until 2005. In the meantime, there is a need to: (1) take appropriate action to protect human health from an imminent threat and/or (2) institute temporary measures to stabilize the IA sites in the short term while a final remedial solution is being developed under the OE RI/FS for these sites. As described in Section 5.0 (Interim Remedial Action Objectives and Selection of Interim Action Sites) of the IA OE RI/FS, the IA sites (Ranges 43-48, Range 30A, and Site OE-16) were selected as priorities for Interim Action because of: (1) the presence of live, sensitively fuzed surface OE items at these sites, (2) their close

proximity to residential neighborhoods, and (3) the history of trespassing incidents at these sites. Other areas at Fort Ord, such as noted in your comment, will be evaluated for OE clean up in the basewide OE RI/FS.

In addition, the Army recognizes the safety issues relating to the lands adjacent to the City of Seaside. The Army has published a Notice of Intent that will allow the Army the ability to address the OE hazards in this area.

Comment 2: **This document fails to mention the numerous amounts of wildlife that are being displaced and disturbed with the Army's hopscotch clean up enterprises and their "blow in place" activities. I have lived my entire life immediately next door to former Fort Ord adjacent to its southern boundary on State Highway 68. In the past two years we have witnessed types of wildlife that we have never seen on our property before. These include packs of coyotes, rattlesnakes, eagles, and red foxes. There also seem to be more migrating deer. The document repeatedly cites the native plants and the HMP. Strangely, it avoids the mammals, reptiles, and bird populations that can and do burn up in wild land fires. The document also seriously downplays the risks of wild land fires getting out of control. Need I remind anyone of New Mexico or Malibu?**

Response 2: The Army recognizes OE remedial activities may have impacts on wildlife living on or near Fort Ord; concerns over impacts to the environment must be balanced with concerns over impacts to human health associated with the presence of OE at Fort Ord. Blow-in-place activities are conducted when OE is found that cannot be safely moved for detonation elsewhere as described in Section 6.0 of the IA OE RI/FS. Section 6.0 also: (1) evaluates "Impacts to Protected and Other Natural Resources" for each of the OE remedial alternatives considered for the IA sites, (2) acknowledges the risk of wildfire escape when prescribed burning is conducted, (3) describes precautions the Army would take to minimize these risks, and (4) outlines an approach to conducting vegetation clearance activities in increments to minimize impacts to wildlife and minimize the risk of wildfire escape. Interim Action vegetation clearance, OE remedial, and OE detonation activities will be conducted in a manner that takes into consideration impacts to animal species found at Fort Ord, including those listed in Table 1 (Habitat Management Plan [HMP] Species at Fort Ord) of the IA OE RI/FS.

The IA OE RI/FS addressed impacts to special-status species that are either protected by the federal or State endangered species acts, considered federal or State species of concern, or are considered rare or endangered by the California Native Plant Society. Impacts to other species including vertebrates are not expected to be significant since the proposed prescribed burns will occur during the time of year when plants and animals have had time to complete their reproductive cycles.

Comment 3: **This piecemeal proposed clean up project has an agenda. It is just not clearly spelled out. I question why the millions of dollars should be allocated to these three areas at this time when we have a situation with a toxic dump on the former Fort Ord property that is contaminating the groundwater. The toxic plume threatens the health of the nearby City of Marina, as well as the students and staff of the California State University of Monterey Bay. If the Army was as interested in public health as they say, they should be moving this toxic dump's contents**

somewhere else. Somewhere else, that has an impervious lining on the bottom of the landfill. It is a question of priorities. It is a question of who benefits.

Response 3: The Army recognizes your concerns regarding chemical contamination at Fort Ord. Chemical contamination at Fort Ord is being addressed under the Installation Restoration Program (IRP) or Basewide Remedial Investigation/Feasibility Study (RI/FS) and Record of Decisions for chemical contamination. Results from these investigations and remedial actions can be found in the applicable site characterization and site confirmation reports. These reports are part of the Fort Ord Administrative Record. This Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study (IA OE RI/FS) and OE RI/FS address OE risks at the former Fort Ord. Risks associated with contact with OE are acute and potentially catastrophic in nature and may result in crippling injuries or death. The Army believes it is necessary to proceed with actions to address OE risks as soon as possible, even concurrent with ongoing chemical cleanup.

Comment 4: Page 11, The one paragraph discussion of the inducement of seawater intrusion offers absolutely no data to back up its assertion that seawater intrusion continues to affect these aquifers. Please provide the data to justify this comment. Also on page 11, under OE RI/FS background, the study states "In November 1998, the Army agreed to evaluate OE at the former Fort Ord in an OE RI/FS consistent with (CERCLA)". The study fails to reveal that citizens sued the Army and that the Army in a settlement agreed to do a BASE WIDE RI/FS.

Response 4: Section 3.2.5.2 (Hydrogeology) provided a reference to the most recent Fort Ord document that presents data regarding saltwater intrusion at Fort Ord. The full citation of the document was provided in Section 9.0 (References), and is available for public review and is part of the Administrative Record for Fort Ord.

Comment 5: Page 14, Under location of Ranges 43-48, it is stated, "Other historic use of the area included a "Company Problems" training area. Please explain what a "Company Problem" is, and what constituted training for "Company Problems" at this area. Are there "Company Problems" still there today?

In my experience of attempting to follow the Superfund cleanup next door to me, the Army plays up or down the "threat" based often on what appears to be politically expedient. I remember when I was told that there were never any Army Tanks at Fort Ord. When the Army admitted that there were Tanks at Fort Ord, I was initially told that they were only "stored" there. Now, this document begins to reveal the existence of "anti-tank" weaponry, and the existence of tanks. Where were the tank training areas? Will these be revealed in the Base Wide RI/FS?

Response 5: The “Company Problems” area was used as a company training and maneuver area. Infantry companies used the area to develop team building and fighting skills under a variety of battle scenarios.

In response to the comment *“Now, this document begins to reveal the existence of “anti-tank weaponry and the existence of tanks”:* Infantry units at former Fort Ord practiced using a variety of weapons including antitank weapons. Antitank weapons (e.g., rockets, missiles and projectiles) were used to train soldiers in tank warfare tactics. The weapons were fired at targets that included unmanned obsolete Armored Personnel Carriers

(APCs), tank hulls, and other hard targets. The information regarding antitank weaponry use at Fort Ord has been available to the public for at least 10 years and can be found in reports at least as early as 1991 (see Work Plan for Basewide Remedial Investigation/Feasibility Study, December 1991, Section 5.39.1, pg. 141).

At this time, two areas potentially related to tank training have been identified at former Fort Ord: the Tank Gunnery Range in the eastern part of the base, and the Ranging Area in the former Fritzsche Army Airfield. Preliminary investigations have been performed at these locations and they have been discussed in the Draft Final Literature Review and the Draft Archives Search Report. To date, only tank maneuvering/driving can be confirmed to have taken place at former Fort Ord; no evidence of tank-fired ordnance has been identified in any of the sites investigated. Detailed discussions of the two tank training areas will be presented in the future OE RI/FS.

Comment 6: **Page 18, Section 4.1.2.3.2, titled "Development Areas (OE-15MOCO.2 and OE-15SEA.4)". It states approximately 11 acres of Development Area lie within this IA site (Plate 3). The 11 acres lie within portions of Ranges 44 and 45 that extend outside the 472-acre Habitat Area. It then goes on to say "THE CLEANUP OF THE REMAINDER OF THE DEVELOPMENT AREA (72 ACRES) IS BEING CONSIDERED FOR COMPLETION UNDER A DIFFERENT PROGRAM AND IS NOT PART OF THIS IA."**

Again, this is not clear as to what is intended, what development is being proposed on the 11 acres, or who may stand to benefit. If safety is the issue, why are not the 72 acres being considered? Why is this section of the study cut short?

Response 6: Since preparation of the Draft IA RI/FS and receipt of regulatory agency comments, the Army has reconsidered the use of mechanical clearance in specific areas and consequently adjusted the Ranges 43-48 IA site boundary to exclude an area of approximately 72 acres planned for future development (Sites OE-15SEA.4 and and majority of OE-15MOCO.2 in the northern portion of Ranges 43-48). A non-time critical action is under consideration. According to onsite OE safety personnel, areas behind the firing lines of these OE sites could be cleared of vegetation using mechanical clearance methods without endangering vegetation clearance workers. The Army has determined the use of mechanical clearance in these areas would comply with the Endangered Species Act (ESA) and Habitat Management Plan (HMP) that limits the use of mechanical clearance methods in the central maritime chaparral (CMC) habitat present over the majority of land in the current Ranges 43-48 IA site boundary.

Comment 7: **Page 19 talks about road clearances that were performed. These road clearances apparently were performed prior to a study. The stated road clearances, the cost of the road clearances, the specific locations of the road clearances on former Fort Ord are not clear. It states the road clearances were performed to facilitate travel within selected portions of the MRA. It then states the Maverick road clearance was "cleared" to a depth of four feet. That is a pretty permanent road clearance. Please clarify. Please clarify the difference between a four-foot deep road clearance and a four-foot deep fuel break.**

Response 7: Access to areas located within the Multi-Range Area (MRA) requires that the roads be cleared of UXO. Clearance to a depth of 4 feet allows for the safe passage of heavy

equipment and support vehicles. There is no difference in UXO removal actions taken during a four-foot deep road clearance or a four-foot deep fuel break clearance. Location of the road and fuel break clearances are shown on Plate 4 and related date is presented in Table 2.

Comment 8: **It was stated at the Army's Community Meeting on February 6, 2002 that the reason Range 30A was included in this Draft Final IA RI/FS was because of its proximity to the Laguna Seca Racetrack. My question as to why the Army chose to clean up an area north of a proposed parking lot for a racetrack (an extra parking lot) over cleaning up areas near the City of Seaside was not adequately answered.**

Millions of dollars of taxpayer money are at stake here. The prioritization of clean up to benefit the safety and preserve the health of the existing residents is the issue. This document is not clear on this issue at all other than repetitiously reiterating the same confusing rationale.

Page 25 of this study document continues (under 4.2.4 Conceptual Site Model) "Depending on the vegetation clearance alternative chosen to support the OE remedial action at Range 30A, portions of other ranges to the south such as Range 28, 29, and 30 may or may not need to be incorporated into the area of remediation."

Thus, here we have a study that leaves open the possibility that the plans will change. We have a study that concludes "burning, blowing in place and subsurface digging" is the Army's preferred alternative. This is not an Investigation or Study. It is an Army Position Paper. I believe it is the reason the Army is denying the public the ability to review it, and to review it with technical advisors. The Army picked the result then set about creating a precedent setting document that will put "the Camel's nose under the tent".

Response 8: Please see Response to Comment 1 regarding the prioritization and selection of sites for interim action and why Range 30A was selected as an interim action site. The decision whether or not to incorporate other ranges to the south of Range 30A (such as Ranges 28, 29 and 30) into the interim action site could not be made due to limited data availability in these areas at the time the IA OE RI/FS was prepared. However, as OE remedial action is conducted at Range 30A, field data may indicate these adjacent areas meet the criteria for interim action, and should be remediated. The Army has made all documents related to the IA OE RI/FS available for public review; copies are available in the Fort Ord Administrative Record, the information repositories and on the web site www.fortordcleanup.com.

Comment 9: **Site OE-16 analysis finds that the location is in close proximity (approximately one mile) to a residential neighborhood (Fitch Park). The document fails to mention proposed new land uses at adjacent Parker Flats. How might this factor in to the prioritization?**

Response 9: The purpose of the interim action (IA) is to remove the immediate threat to public safety. The proximity of Site OE-16 to the Fitch Park residential area constitutes an immediate threat to public safety, and for that reason, it is included in the IA. Because the IA

addresses immediate threats to existing nearby residents, the proposed land use of the Parker Flats area is not a factor in prioritizing actions to be taken at Site OE-16.

Comment 10: Page 37 contains a false statement/conclusion under "Impacts to the Public" i.e., "Conducting a prescribed burn within the IA sites is not expected to have adverse impacts on the public because it would include informing and offering support to affected residents and coordinating relocation efforts during and for a period after a burn..."

Much of the public, myself included, will be forced to make a choice of staying home and being poisoned by the smoke but protecting one's home from being burned down by the fire "accidentally" getting away, OR leaving to stay at a Motel 6 type operation and risking coming home to have everything burned down. This is really no choice at all. The statement under "Impacts to the Public" is tantamount to the Government saying, "Hi, we are the government and we are here to help you!"

As one who grew up across the road from former Fort Ord, I was witness to the out of control fires that erupted infrequently due to live fire exercises in dry grass. The Army and the 7th Division were on hand then to help put the fires out. Intentionally starting fires in California on dry hills is a very dangerous thing to do. It puts me at risk. It puts my family at risk. It puts the Highway 68 Corridor community at risk.

Response 10: The Army acknowledges your concerns regarding the risks associated with a prescribed fire to go beyond containment lines. Please see Section 6.1.1.2 (Prescribed Burning, Level of Effort in Terms of Personnel) for precautions the Army would take to minimize these risks.

Comment 11: What is the basis for the costs of alternatives? Where is the underlying data? Where is it available? Isn't it "might be 50% more or 30% less" a very broad range? What factors might either really elevate the costs or diminish the costs? If a fire gets out of control and burns surrounding residential neighborhoods, how might that elevate the costs? If my attorney sues, how might that elevate the costs?

Response 11: References to the sources of information had been added to Appendix C. EPA Guidance (*A Guide to Developing and Documenting Cost Estimates During the Feasibility Study - July 2000*), indicates the level of detail required in feasibility study cost estimates, and recognizes at the RI/FS stage, that an accuracy of +50/-30 percent is a reasonable range of accuracy. The cost estimates presented in the IA OE RI/FS follow these guidelines, and include a percentage of total costs added as a contingency for unknown future costs.

Comment 12: Page 83, Section 8.3.2, titled "Community Relations Strategy" The Army has violated every one of the seven listed objectives.

Response 12: The Army disagrees. The Army strives to meet the objectives through work with the public and regulatory agencies in conducting community relations activities. The Army's community relations activities specific to the interim action program to date include two symposia, two community bulletins mailed to over 40,000 households in the community, presentations at regularly scheduled Community Involvement Workshops and Technical Review Committee meetings, and discussions with local interest groups. Following this

IA OE RI/FS, the Proposed Plan will be issued for a 30-day public comment period and two public comment meetings are scheduled to gather public comments.

Comment 13: This document's revelation that burned unexploded ordnance is often more dangerous after a fire is not adequately analyzed in terms of alternatives.

Response 13: Under OE removal procedures, any OE or suspected OE item must be considered as sensitive and dangerous, and handled with extreme caution unless determined otherwise by a trained UXO personnel. Any UXO that may be destabilized by the heat of burning vegetation will be removed by these trained personnel.

Comment 14: The risk of escaped fires or wildfires is downplayed and not adequately analyzed. The language that there were regular natural fires at Fort Ord is not borne out by scientific data. Where is your data on this?

Response 14: As discussed in Section 6.1.1.2 (Prescribed Burning, Use at Fort Ord and Other Sites and Under What Conditions), prescribed burning has been extensively used at Fort Ord. The table in that section provides specific information about recent uses of prescribed burning in support of OE cleanup activities.

Comment 15: Page 42 of this document states "Prescribed burning has been used extensively at the former Fort Ord." is an undocumented assumption and statement. Where is your data?

Response 15: Section 6.1.1.2 (Prescribed Burning; Use at Fort Ord and Under What Conditions) of the IA OE RI/FS includes a discussion of prescribed burns that have been conducted at Fort Ord.

Comment 16: Page 50 reveals the Army position that OE removal to depths consistent with planned re-use was selected. The document then fails to adequately reveal the planned or proposed reuse. The public has a right to know where millions of dollars of their tax money is going. This document fails to analyze surface or one foot deep clean up for safety versus four foot deep clean up. The data on the different costs, I believe is minimized. Where is the data? How was it computed? Total costs listed and added for the Army's selected/preferred alternative for the three areas ranges from an estimate of $23.5 million to $25.1 million. These numbers may be 50% higher or 30% lower. For this kind of money, the public deserves the right to have adequate time to review this document, ask questions, have technical advisors ask questions, AND GET ANSWERS. This all needs to happen PRIOR to the Army springing its Plan on the neighbors.

Response 16: Section 6.1.2.3 (Identify and Remove OE) of the IA OE RI/FS indicates subsurface removal would be conducted to depths consistent with planned reuse on each area. Planned reuse for the IA areas are described in Section 4.0 (Interim Action Remedial Investigation) based on a current understanding of reuse as either habitat area or development. Data used in developing costs was based on OE contractor estimates.

The above is by no means a complete review of the document.

IIB. COMMENTS FROM EDWARD M. OBERWEISER, MBTP BOARD OF DIRECTORS, SANTA CRUZ, CALIFORNIA, DATED FEBRUARY 16 and 17, 2002

COMMENTS DATED FEBRUARY 16, 2002

Resubmission: FOR THE ADMINISTRATIVE RECORD

Comment: **I am formally requesting an extension of the thirty day public comment period for the "Interim Action, RI/FS.**

Only in the last two weeks have the documents been in the hands of some interested members of the Monterey Bay communities. That is not anywhere near enough time to read, digest and make comment on this extremely complex and important document.

One of our Board members, Michael Weaver only received a copy less than weeks ago.

Our Technical Advisors still have not received the "Draft Final Interim Action, RI/FS" or the supporting documents for review, so they can deliver their report to us on this document, and make their comments as well.

This has been an ongoing problem for the entire seven years I have been involved in the cleanup of the former Fort Ord Army base. The public does not receive complete documents from the Army in a timely manner for adequate review and comment.

The Monterey Bay Toxic Projects cannot perform its function under the EPA Technical Assistance Grant until our advisors have had adequate time to read, review and write a proper response to the Draft Final.

Only after we have received our Technical Advisors report, will we be able to set up a Monterey Bay Toxic Projects public meeting and explain the document to the general public in more accessible language.

Response: A letter was sent to you on February 27, 2002 in response your request for a 30-day extension for reviewing the Draft Final IA RI/FS report.

Comment: **As regards the document, it appears the Army is trying to complete separate EISs on different ranges. Under NEPA, evaluation of the actual and potential impacts of Army activities at these and other ranges must be treated as a single "action" for NEPA purposes, and must be considered in a single EIS.**

Response: Since the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and National Contingency Plan (NCP) provide a process for public involvement in a manner that is functionally equivalent to the requirements of National

Environmental Policy Act (NEPA), compliance will be achieved by following the CERCLA/NCP procedures. CERCLA specifically seeks to avoid unnecessary duplication of effort. The CERCLA/NCP process addresses, where appropriate, consideration of environmental effects and compliance with applicable legal standards, and the public will be afforded the same opportunity to review and comment that is provided by NEPA.

Comment: **Also, the document includes no discussion of the chemicals contained in the smoke that will be emitted during the burning. This makes it impossible to fully assess impacts to the humans and the environment due to the smoke emissions.**

Response: Section 6.0 (Interim Action Feasibility Study; Air Emissions) summarized the results of the *Technical Memorandum, Air Emissions from Incidental Ordnance Detonation During a Prescribed Burn on Ranges 43 through 48, Former Fort Ord* (*Harding ESE, 2001c*) (Air Emissions Technical Memorandum), which was prepared to (1) quantify a reasonable upper bound estimate of air emissions from incidental detonation of OE in Ranges 43 through 48, (2) compare those emissions with those expected from burning of biomass, and (3) compare screening level estimates of pollutant concentrations from OE to health-protective regulatory screening values. The Air Emissions Technical Memorandum concluded that air pollutant emissions from incidental OE detonation during a prescribed burn in Ranges 43 through 48 will be minor compared to emissions contributed directly by biomass burning, and will result in pollutant concentrations well below health-protective regulatory screening levels.

Please include this in the administrative record as comments on the Draft Final, Interim Action Ordnance and Explosives RI/FS for Ranges 43-48, Range 30A, Site OE-16 Former Fort Ord, California.

COMMENTS DATED FEBRUARY 17, 2002

Resubmission: FOR THE ADMINISTRATIVE RECORD

Please include this as an addendum to my previous comments. I am formally requesting an extension of the thirty day public comment period for the "Interim Action, RI/FS."

Response: A letter was sent to you on February 27, 2002 in response your request for a 30-day extension for reviewing the Draft Final IA RI/FS report.

Comment 1: **Only in the last two weeks have the documents been in the hands of some interested members of the Monterey Bay communities. That is not anywhere near enough time to read, digest and make comment on this extremely complex and important document.**

One of our Board members, Michael Weaver only received a copy less than weeks ago.

Our Technical Advisors still have not received the "Draft Final Interim Action, RI/FS" or the supporting documents for review, so they can deliver their report to us on this document, and make their comments as well.

This has been an ongoing problem for the entire seven years I have been involved in the cleanup of the former Fort Ord Army base. The public does not receive complete documents from the Army in a timely manner for adequate review and comment.

The Monterey Bay Toxic Projects cannot perform its function under the EPA Technical Assistance Grant until our advisors have had adequate time to read, review and write a proper response to the Draft Final.

Only after we have received our Technical Advisors report, will we be able to set up a Monterey Bay Toxic Projects public meeting and explain the document to the general public in more accessible language.

Response 1: The Army has made all documents related to the IA OE RI/FS available for public review at the time they are published; copies are available at the Fort Ord Administrative Record, in the information repositories, and on the website (http://www.fortordcleanup.com).

Comment 2: As regards the document, it appears the Army is trying to complete separate EISs on different ranges. Under NEPA and the required EIS evaluation of the actual and potential impacts of Army activities at these and other ranges must be treated as a single "action" for NEPA purposes, and must be considered as a single EIS. Additionally you must comply with the substantive requirements of the California Environmental Quality Act (CEQA).

Response 2: Since the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and National Contingency Plan (NCP) provide a process for public involvement in a manner that is functionally equivalent to the requirements of National Environmental Policy Act (NEPA), compliance will be achieved by following the CERCLA/NCP procedures. CERCLA specifically seeks to avoid unnecessary duplication of effort. The CERCLA/NCP process addresses, where appropriate, consideration of environmental effects and compliance with applicable legal standards, and the public will be afforded the same opportunity to review and comment that is provided by NEPA. CEQA does not apply to federal decisions.

Comment 3: Also, the document includes no discussion of the chemicals contained in the smoke that will be emitted during the burning. This makes it impossible to fully assess impacts to the humans and the environment due to the smoke emissions.

Response 3: Section 6.0 (Interim Action Feasibility Study; Air Emissions) summarized the results of the *Technical Memorandum, Air Emissions from Incidental Ordnance Detonation During a Prescribed Burn on Ranges 43 through 48, Former Fort Ord* (*Harding ESE, 2001c*) (Air Emissions Technical Memorandum), which was prepared to (1) quantify a reasonable upper bound estimate of air emissions from incidental detonation of OE in Ranges 43 through 48, (2) compare those emissions with those expected from burning of biomass, and (3) compare screening level estimates of pollutant concentrations from OE

to health-protective regulatory screening values. The Air Emissions Technical Memorandum concluded that air pollutant emissions from incidental OE detonation during a prescribed burn in Ranges 43 through 48 will be minor compared to emissions contributed directly by biomass burning, and will result in pollutant concentrations well below health-protective regulatory screening levels.

Please include this in the administrative record as comments on the Draft Final, Interim Action Ordnance and Explosives RI/FS for Ranges 43-48, Range 30A, Site OE-16 Former Fort Ord, California.

IIC. COMMENTS FROM MRS. W.V. GRAHAM MATTHEWS, CARMEL VALLEY, CALIFORNIA, DATED FEBRUARY 19, 2002

Thank you for returning my call regarding the deadline for comments on the Interim RI/FS document and for alerting me that it could be found on the Fort Ord website. I have not been able to review it thoroughly but sufficiently to be able to make the comments below. As Julie Anne Delgado, current co-president of the Monterey Bay Chapter of CNPS, will be commenting on the document for that organization, I am writing as an individual with over 40 years of involvement in conservation issues on the Monterey Peninsula. By way of background, I served as state forestry coordinator for CNPS for over 15 years and was instrumental in the development of its fire and post-fire seeding policies for native habitat. I am also the author of the widely used book, *An Illustrated Key to the Flowering Plants of Monterey Co*.

Comment 1: **As a general statement I strongly support prescribed burns and let-burn policies where public health and esthetic values can be protected. The Mediterranean-type plant communities that occur at Fort Ord not only benefit from fire, but also support a variety of "fire follower" native annuals that germinate only or primarily after a fire, serving to hold the soil until the dominant shrubs recover. I appreciate that this document recognizes these values.**

I am concerned about the limited number of species found in the three areas considered in this document. I do understand that this study is limited to Ranges 43-48, 30A, and OE-16; however, because it is likely to become a template for the base-wide OE RI/FS, it is very important that the methodology be thorough and accurate. I note in section 3.2.4.2 that many surveys are listed between 1994 and 2000, but it is not clear that they were necessarily done at the time of year to cover the blooming period of the large number of rare, threatened, and endangered (RT&E) plants that occur on the base.

Response 1: Your comment is acknowledged regarding your support of prescribed burning where protection of public health and esthetic values can be protected. The methodology for development of the burn prescription will be described in the Operational Burn Plan. Baseline surveys for HMP annuals were conducted at Ranges 43 – 48 in April 2000 during a blooming period. Surveys were conducted by inspecting areas of known or potential habitat by walking transects at approximately 25-foot intervals. Observed populations have been mapped using global positioning satellites. Neither Hooker's manzanita or Coast wallflower were found during the 1992 or 2000 surveys of Ranges 43-48. Hooker's manzanita can be surveyed at any time of the year since it is not an annual plant. Coast wallflower would have been identified during the annual plant survey if it were present.

Comment 2: **Central maritime chaparral is correctly considered to be "rare and declining and of the highest priority;" while the document identifies six RT&E species (4.1.2) found in mature and intermediate habitat, it recognizes that the seedbank for other sensitive species, particularly "fire followers," doubtless exists in the soil. It is therefore imperative that the timing of burns mimic the natural regime as closely as possible and that clearing for firebreaks, etc. disturb as little of the site as possible. I applaud the plan to develop baseline data before the OE remedial action and to**

monitor for five years afterward. One of the main purposes of this monitoring should be to identify and quantify RT&E annual "fire followers."

Response 2: Your comment is acknowledged regarding the timing of burns to mimic the natural regime of seedbank germination as closely as possible with minimal site disturbance, and collection of baseline data. We agree with your comment to minimize disturbances during OE clearance operations. Existing roads have been used as fuel breaks to reduce the risk of weed infestations and habitat loss. Habitat monitoring occurs for five years following the cleanup to identify problems such as weed infestations during the habitat recovery. Weed and erosion control have been ongoing at former Fort Ord through an agreement with the Bureau of Land Management and California Department of Parks and Recreation since the base closed in 1994 and will continue until the property is transferred.

Comment 3: I note that no baseline study has been done for Range 30A (4.2.2.1) nor has the density of the plant species been estimated. I urge that it be given the same baseline and monitoring treatment as Ranges 43-48. Regarding OE-16, inasmuch as Hooker's manzanita is found on that site (4.3.2.2), it seems likely that suitable habitat for it exists on the other two sites.

Response 3: Collection of biological baseline data will occur at Range 30A before the vegetation is cleared. Hooker's manzanita is expected to occur at Range 30A but not at OE-16 or Ranges 43 – 48 based on the flora and fauna surveys conducted to develop the HMP (see HMP Figure B-11).

Comment 4: Under Prescribed Burning (6.1.1.2), the report indicated that burning resulted in an estimated 3000 plants per acre compared to 29 for cutting. Diversity was also much higher (pp. 40, 47). These conclusions are consistent with other studies and serve to justify the use of prescribed fire in natural preserves even if there is some inconvenience to surrounding residents. It is critical to devise and follow a careful prescription to minimize smoke and to warn residents well in advance of planned burn days as the document proposes. The propensity of weeds to colonize disturbed areas and fire roads can be a serious problem in natural areas; therefore, weed control after a fire should be a part of this plan. If disturbance is strictly minimized during prescribed fires, post-fire weed control should be only a minor expense, but it should be included in budgeting. Detonation of OE may result in additional disturbed areas that may require weed control. Mechanical cutting also promotes weed infestations and can cause serious erosion if not carefully done; I therefore would oppose this procedure on any areas slated for habitat preservation. I am gratified to see that the USF&WS has also taken this position (p. 44).

Response 4: Your comment is acknowledged regarding the benefits of prescribed burning. The methodology for development of the burn prescription will be described in the Operational Burn Plan.

Comment 5: It is a matter of concern that the Air Pollution Control District's recent Smoke Management Draft EIR finds that significant amounts of the toxic substance acrolein are found in smoke from burning vegetation. Every effort should be made to monitor this pollutant and reduce its impact to the minimum level.

Response 5: Your comment is acknowledged regarding air pollutant monitoring during prescribed burning. The methodology for development of the burn prescription will be described in the Operational Burn Plan, and an air monitoring plan will also be developed prior to a burn.

In summary, I support the Preferred Alternatives with attention to RT&E plant species that I have recommended and careful adherence to a Prescribed Burn Plan to minimize impacts on public health and air clarity.

I am glad to know that the IA RI/FS will be followed by the Proposed Plan, which will be released early next month for a public comment period of 30 days. As I mentioned to you, I was disappointed not to receive a copy of the IA RI/FS, even though I attended both workshops conducted by the Army at the Monterey Conference Center in September and November. Therefore, I would very much like to receive a copy of the plan or at least a fairly detailed summary as an alternative if the document is very large.

IID. COMMENTS FROM UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT, HOLLISTER RESOURCE AREA DATED FEBRUARY 13, 2002

The BLM appreciates the efforts of the Army in the preparation of the Draft Final Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study For Ranges 43-48, Range 30A, Site OE-16 Former Fort Ord, California (RI/FS). Because most of the sites evaluated in the RI/FS are scheduled to be transferred to the BLM for habitat management and public recreation, the BLM is very interested in the cleanup operations. The following comments reflect our review of the document.

Comment 1: **Section 3.2.3.3 Future Land Uses. The RI/FS indicates that future uses are based upon several plans including the Bureau of Land Management (BLM) Site Use Management Plan (SUMP) (USACE 1995). This section also explains that lands within the Multi-Range Area (MRA) are designated as either Unrestricted Areas, Unrestricted/BLM areas, Limited Access areas, or Restricted/Administration areas. Ranges 43-48 encompass lands that include all four of the designations within the SUMP. Site OE-30A encompasses lands that are almost entirely designated as Restricted/Administration areas.**

While the SUMP was a useful document in delineating potential future uses based upon then known UXO cleanup technologies, site conditions, and habitat management requirements, the BLM has learned that it is not feasible to manage lands under the Installation-Wide Multispecies Habitat Management Plan (HMP) through a Restricted/Administration area designation. Should the BLM accept these lands for management under the HMP, cleanup levels would need to be sufficient to allow for habitat restoration activities, recreational uses and road/trail development. Furthermore, as lands become developed around the margins of the MRA, the BLM will need more freedom to fight wildland fire which will require UXO cleanup sufficient to work safely off designated fuelbreaks and roads in an emergency situation.

Response 1: Army acknowledges the need for BLM to manage lands for habitat restoration activities, recreational uses and road/trail development in a manner that may extend beyond SUMP designations. The preferred OE remedial action alternative is for subsurface OE removal to be performed to depths consistent with planned reuse. The Army looks forward to working with BLM to establish appropriate OE removal depths in the site-specific work plans for the IA sites.

Comment 2: **Section 6.1.2.3 Identify and Remove OE. The RI/FS identifies the appropriate cleanup depth scenario for OE removal as "Identify, Investigate, and Remove All Anomalies to Depths Consistent with Planned Reuse In Each Area". As stated above, the BLM can support this removal scenario as long as it does not reflect future land-uses proposed under the SUMP for the Restricted/ Administration designation. It is our understanding that a Site-Specific Work Plan will be prepared for each site that will delineate OE removal depths to support future land-uses. The BLM will work with the Army on that Work Plan for lands that it is scheduled to receive, however, emphasizes that lands must be cleaned sufficient to allow for**

wildland fire suppression, habitat restoration activities, recreational uses and road/trail development.

Response 2: The Army looks forward to working with BLM on the issues outlined in the comment regarding site-specific work plans.

Comment 3: Sections 7.1.1, 7.2.1, and 7.3.1 Summaries of Preferred IA Alternatives. The BLM generally supports the preliminarily preferred IA alternatives for Ranges 43-48, Range 30A and OE 16 noting some concerns above. We share the concern of the U.S. Environmental Protection Agency described in Comment 2 within their December 7, 2001 letter which refers to the size of the treatment areas. The potential prescribed burn areas for Ranges 43-48 and Range 30A are very large and OE discrimination and cleanup crews will be hard pressed to finish all of the required work before the vegetation regenerates and covers the sites. The size of the preferred burns, we presume, are based upon the presence of existing control lines and fuelbreaks that will be necessary to contain the fire. The IA/RS should provide a better explanation of why the proposed treatment sites are so large. Smaller treatment blocks (i.e., prescribed burn areas) may be easier to control, and would reduce smoke production and duration.

Response 3: We understand your concern regarding the ability to complete the cleanup before the vegetation regenerates and covers the site. However, remediation is being planned to ensure cleanup is completed without having to re-disturb the vegetation. Once the site is burned, the surface will be cleared of OE and metal to facilitate the use of digital geophysical detection equipment that will be used to map the site. Once the electronic data has been evaluated, specific anomalies will be identified for excavation and removal starting in the chaparral habitat areas. Even if the vegetation regenerates before all the targets are excavated, the targeted anomalies can be reacquired and removed without the need to clear vegetation from the site.

Reducing the size of the cleanup site would require construction of new fuel breaks that would result in additional habitat loss, increase the risk of erosion and spread of invasive weeds, and cause additional adverse impacts to the rare maritime chaparral plant community. In addition, creation of smaller burn polygons would require many more burn days and result in smoke being in the air for more than the one to three days that is anticipated under the current plan. Furthermore, creating additional firebreaks within these polygons would require OE clearance in areas potentially heavily impacted by OE, and may be impractical. The methods to be used in conducting prescribed burns, pretreatment of fuel breaks with retardant, burning under ideal weather conditions, and use of helicopters, will enable the Army to control the fire.

Comment 4: Appendix B (Screening Evaluation of OE Remedial Action Depths) and Appendix C (Interim Action Remedial Alternatives Cost Estimates). The information in these two appendices is very helpful and we realize that much speculation is involved in approximating cleanup costs under various removal depths. Although the analysis does show that removals are more expensive under a four foot depth as opposed to a one foot depth, we believe that the cost is not prohibitively different to select a one foot removal depth. For example, subsurface OE removal for Ranges 43-48 under a one foot depth scenario is estimated at 9.5 million dollars, and under a four foot removal the estimate is 10.0 million dollars. The BLM believes that the Army

should consider the deeper OE removal depth in areas that are scheduled to be transferred to the BLM.

Response 4: The Army acknowledges your comment regarding OE removal depths. The preferred OE remedial action alternative is for subsurface OE removal to be performed to depths consistent with planned reuse, and is not limited to conducting a 1 foot removal. The Army looks forward to working with BLM to establish appropriate OE removal depths in the site-specific work plans for the IA sites.

Comment 5: Based upon six years of managing 7,200 acres at Fort Ord, the deeper removal level is consistent with the types of land management activities that can be expected under the HMP for the MRA. The BLM will often need to penetrate the surface deeper than one foot while conducting native plant restoration activities, and road/trail maintenance and development. We also believe that it is impractical to remove OE to a depth of one foot, then require Army COE support for disturbances to a deeper depth on a case by case situation.

Response 5: Please see Response to Comment 4 above.

Comment 6: The freedom to penetrate the surface to a deeper depth is very important for our emergency fire suppression responsibilities which will become increasingly more critical as land is developed around the margins of the BLM's habitat area. While the BLM will strive to aggressively fight wildfire indirectly from established control lines and fuelbreaks, there may be times when fire crews will need to arrest an approaching fire directly if that fire threatens development or other sensitive resources. For this reason, coupled with the fact that other management activities often require periodic subsurface disturbance deeper than one foot, the BLM supports a deeper removal depth.

Response 6: Please see Response to Comment 4 above.

Thank you for the opportunity to comment on this document and we appreciate your efforts in considering a wide range or alternatives. We look forward to working with the Army on OE removal Work Plans and prescribed fire burn plans related to the base clean up. If you have any questions, feel free to contract Eric Morgan our Project Manager at (831) 394-8314.

IIE. COMMENTS FROM BRUCE DELGADO, BOTANIST, MARINA CITY COUNCIL, MARINA, CALIFORNIA, DATED FEBRUARY 19, 2002

First, I'd like to thank you for and appreciate all the effort that has gone into the Interim RI/FS process. It is my hope that this document and those that will soon follow will renew progress toward the reuse and clean-up of Fort Ord for the benefit of all of Monterey County citizens and that it will do so in an environmentally-sensitive manner. I agree with the preliminary preferred alternative to use prescribed burning and I believe implementing a safe burn program should be the paramount objective to both sustains healthy human and non-human life in and around Fort Ord.

Below are my specific comments on the Draft Final Interim RIFS:

Comment 1: **Section 3.2.3.3 (pg. 8). Existing fuelbreaks will also be cleared of OE sufficient to allow heavy equipment to travel over fire roads (suggest adding here "and adjacent, usually 15' wide, strips of vegetation clearance areas") for firefighting activities and annual maintenance.**

Response 1: Fuel breaks are between 45 – 50 feet wide and OE has been removed from existing roadbeds to a depth of 4 feet. However, the Army is considering removing OE from the strips of vegetation clearance areas to provide additional safety for fire-fighting activities.

Comment 2: **Section 4.1.2 (pg. 16). Here it is written that "Table 1 provides a list of HMP species found at Fort Ord and their associated status." Table 1 appears to only list HMP species observed in ranges 43-48. For this reason I assume such HMP species such as Hookers manzanita, coast wallflower, Monterey (Toro) manzanita, and California tiger salamander were excluded from Table 1. Table 1 and text on pg. 16 should clarify if they represent all of Fort Ord or just Ranges 43-48.**

Response 2: The HMP species list on Table 1 and discussed in the text identify the species present at all three of the IA sites (Ranges 43-48, Range 30A, and Site OE-16). In addition, the species listed in the comment, including Toro manzanita (*Arctostaphylos montereyensis*), Hooker's manzanita (*Arctostaphylos hookeri*) and California tiger salamander (*Ambystoma tigrinum californiense*) are also present at some or all of these sites, and were erroneously not included in the table. Hooker's manzanita is present within Range 30A based on Figure B-11 of the HMP and Toro manzanita is present within OE-16 based on Figure B-5 of the HMP.

Comment 3: **Pgs. 16-18 do not mention if seasonal surface water occurs in Ranges 43-48. If there are seasonal surface waters within 1 kilometer of any of the ranges proposed for interim action some mention of protocol that would be followed to minimize potential impact to California tiger salamander would be appropriate. Plate 6 of Range 30A appears to show a grassy depression near the center of this range that could hold surface water, but this is difficult to tell from this aerial.**

Response 3: There are no vernal pools located within the three IA sites based on Figure H-3 of the Flora and Fauna Baseline Study of Fort Ord, California, December 1992. However, there are three vernal pools located within one kilometer of Site OE-16 and one located

adjacent to Range 30A. Therefore, potential upland habitat for the California tiger salamander may occur within OE-16 and Range 30A. However, no California tiger salamanders were found during baseline monitoring of the vernal pools near Site OE-16 during the spring of 1998 and 2000. Should the presence of California tiger salamander be confirmed in the IA areas, work will be conducted in a manner protective of this species.

Comment 4: **I would reasonably expect that Hookers manzanita and possibly coast wallflower occurs in Ranges 43-48. Hookers manzanita could plausibly occur in Mature, Intermediate and Disturbed Habitat. Coast wallflower could plausibly occur in at lease disturbed habitat of these ranges. What year and time of year were botanical surveys completed in Ranges 43-48? Were surveys conducted just along certain transects and roads or throughout Ranges 43-48? If thorough surveys were not safe to conduct then text should be modified to include the possibility that HMP species other than those observed during surveys could occur within these ranges. This is important because improper timing of surface-disturbing activities could adversely affect coast wallflower and burning could provide benefits for HMP species listed in the text and others such as Hookers manzanita and coast wallflower which aren't listed in the test.**

Response 4: Baseline surveys for HMP annuals were conducted at Ranges 43 – 48 in April 2000. Surveys were conducted by inspecting areas of known or potential habitat by walking transects at approximately 25-foot intervals where safety allowed. Observed populations have been mapped using global positioning satellites. Neither Hooker's manzanita or Coast wallflower were found during the 1992 or 2000 surveys of Ranges 43 – 48.

Comment 5: **Section 6.1.1.2 (pg. 39 – Air Emissions). Here the text states "These air emissions may potentially include combustion products, volatile or semivolatile organic compounds, unburned or incompletely burned energetic material, and particulate metals and metal compounds …"**

However on pg. 40 where results of an emissions investigation are discussed there is no specific mention of semivolatile organic compounds, unburned or incompletely burned energetic material, or metal compounds. Is it possible that the text could be augmented to give percentage comparisons between reasonable upper bound emissions for these omitted elements expected from incidental OE detonation and biomass burning? I appreciate the fact that the conclusion of this investigation is that pollutant emissions from OE detonation will be minor and below health-protective regulatory screening levels. Thank you for your in-depth emissions study. I think the document would be strengthened if it showed the additional comparisons requested above.

Response 5: The results of the study is documented in *Technical Memorandum, Air Emissions from Incidental Ordnance Detonation During a Prescribed Burn on Ranges 43-48, Former Fort Ord, California*, which is available in the Administrative Record. Your suggestions are appreciated and will be considered in development of the Operational Burn Plan, which will address air sampling.

Comment 6: **Pg. 40 – Erosion. I agree with the statement that, in the long term, burning would have a beneficial impact on the health and growth of plants and their stability. I**

also agree that usually erosion is often minimal after burning due to rapid and robust revegetation after fire in maritime chaparral. However the potential for erosion after fire (or other clearance method) increases with both the intensity of precipitation the first two years after fire (or other clearance method) and the number and steepness of roads and fuelbreaks (both current and historical) and other disturbance features in or near the burn (or otherwise cleared) area. For this reason I suggest two mitigation measures be written into this document to minimize erosion potential: (1) The number of roads and fuelbreaks and the steepness of fuelbreaks chosen for fire suppression will be reduced to the maximum extent possible to reduce erosion potential. Larger sized burn (or otherwise cleared) areas would reduce erosion potential as compared to smaller areas. (2) Current and historical roads, fuelbreaks, and other disturbed areas would be monitored at least for two years after the proposed vegetation clearance occurs and actions such as seeding of non-invasive grasses, broadcasting weed-free straw, and installation and maintenance of erosion control features would be implemented as necessary to arrest erosion where it is observed. Budget planning should include the provision of funds for this purpose so monies would be available when and if needed.

Response 6: Roads and fuel breaks to support potential prescribed burns at OE-16, Range 30A and Ranges 43 – 48 have been created using the existing road and fuel break system. The existing roads were used to avoid impacting the rare species and their habitat as well as to minimize the risk of erosion and spread of invasive weeds. Furthermore, creating additional firebreaks would require OE clearance in areas potentially heavily impacted by OE, and may be impractical. Maintenance of fuel breaks and control of invasive weeds will continue to be an Army land management requirement until the property is transferred to the future recipients.

Comment 7: Pg. 40 – Impacts to Protected and Other Natural Resources. I fully agree and have observed both during my work as a botanist on Fort Ord and in my private life investigating areas burned by the Army on Fort Ord that burning rejuvenates and enhances the overall diversity and HMP species diversity, HMP species abundance, and HMP species reproductive output (flowers, and by deduction, fruits and viable seed) more than simply cutting vegetation. The 1997 Army fire that burned Army OE site 10B and 300 acres on the east side of Barloy Canyon Road resulted in the highest diversity of native fire-following plant species, and the largest specimens of the endangered sand gilia ever observed by myself or any of the several professional and local expert botanists I have spoken with about this issue. The majority of recent fires on Fort Ord (OE 10A, OE 10B, and Plant Reserve #3 on the west side of Parker Flats Cut-off) have resulted in robust expressions in terms of numbers and sizes of individual plants of HMP species such as coast wallflower, sand gilia, Monterey spineflower, and Monterey manzanita. In comparison, areas where vegetation was manually or mechanically cut on Wolf Hill and between Parker Flats Road and the dirt portion of Watkins Gate Road north of Eucalyptus Road the expression of these HMP species was almost absent. Instead these cut areas supported mostly a fast regrowth of a few common scrub species such as shaggy-barked manzanita, black sage and coyote bush.

Response 7: The Army has been working with the BLM and California Department of Parks and Recreation to control the spread of invasive weeds into areas identified as future habitat

reserves. The Army plans to continue this effort until such time the property is transferred.

Comment 8: **Unfortunately the increased biodiversity found after fire does include a large potential for weed problems. This is not news for Fort Ord Army and Base Realignment and Closure staff and they have provided effective weed abatement on Fort Ord for several years. I suggest some mention of invasive non-native weeds be added to pg. 40. Similar to the need for post-vegetation clearance erosion monitoring mentioned above. 1) The number of roads and fuelbreaks chosen for fire suppression will be reduced to the maximum extent possible to reduce invasive weed potential. Larger sized areas cleared of vegetation would reduce invasive weed potential as compared to smaller areas because larger areas would have less "edge" areas and less human-disturbed areas which are more vulnerable to weed invasions. 2) Current and historical roads, fuelbreaks, and other disturbed areas would be monitored at last for two years after the proposed vegetation clearance occurs and weed abatement would be implemented as necessary to arrest weed invasions where they are observed. Budget planning should include the provision of funds for this purpose so monies would be available when and if needed.**

Response 8: Please see Response to Comment 6 above.

Comment 9: **6.3.1.2 (Implementability) and 6.3.1.3 (Cost). Perhaps I missed some references but I am concerned that these sections do not seem to discuss the potential for erosion and invasive weed problems after remedial actions are taken. Can the Army ensure that time will be allotted for weed abatement after surface clean up efforts and before revegetation makes weed abatement impractical or significantly more expensive than it would be during the initial two years post-remedial action? Table 5, pg. 1 of 11. Endangered Species Act. Includes in the Remarks column that "The report recommends measures to ensure compliance with this ARAR." I suggest specifically including measures that would be taken to abate erosion and invasive weeds should these potential problems occur, especially within the first 1-3 years when OE clearance is proposed to be taking place. Coordinated planning and funding would be appropriate for all of these efforts to be successful.**

Response 9: Section 6.3 states O&M costs over a monitoring period of five years are estimated for the prescribed burning, mechanical, and manual clearance alternatives. These cost estimates include not only habitat monitoring and reporting requirements, but also include the cost to implement erosion and invasive weed control measures. This cost is based on the historical expense of implementing the HMP during caretaker and pre-disposal actions.

Table 5, page 1 of 11 identifies the Endangered Species Act (ESA) as an Applicable and Location Specific Applicable or Relevant and Appropriate Requirement (ARAR). The HMP was developed following consultation with the U.S. Fish and Wildlife Service as required by the ESA. The HMP establishes mitigation measures to avoid or reduce impacts to special-status species during the Army's pre-disposal actions such as the cleanup of unexploded ordnance. The Army is required to ensure the reestablishment of healthy high-diversity maritime chaparral habitat that has a variety of seral stages and age classes that includes microhabitat for sand gilia, Monterey spineflower, Seaside bird's beak, and black legless lizard. Implementation of erosion and exotic weed control

measures are a part of fulfilling the Army's obligations identified in the HMP. The Army plans to continue this effort until such time the property is transferred.

Comment 10: Appendix C Cost Estimates. Upon my brief review of this appendix I didn't see any reference to the cost of post interim action weed or erosion abatement. Weed abatement could cost as much as $200 to 400 per acre for each of the first 2 to 4 years after a fire or other vegetation clearance effort. I would guess erosion abatement could cost approximately $2000 per mile of fuelbreaks for either of the first three years after a burn or other vegetation clearance if there was significant precipitation such as occurred in the 1997-1998 El Nino winter.

Response 10: Please see Response to Comment 9 above. In addition to operations and maintenance costs described in Comment 9, costs were included under the subsurface OE removal alternatives for site restoration and erosion control measures to be implemented as these actions are completed.

Comment 11: Appendix D, pg. D2. Response 2 states that Section 6.3 has been revised to include estimates of vegetation regrowth and OE Remedial Action durations. Section 6.3 is fairly long and involved and I wasn't able to find these revisions though I expect they were made. I agree with the concern of Comment #2. Response #2 states that surface clearance could occur in the first year post-remedial action and that subsurface removal operations can be performed as vegetation grows back. I have two concerns about this. 1) While feasible, it may prove difficult to complete surface clearances and to detect and mark all subsurface items in 1-2 years after remedial actions. 2 Changing clean-up priorities negotiated between Fort Ord Reuse Authority and Army or other events could affect the proposed clean-up timetable after vegetation clearance is completed. I suggest the text be augmented in the appropriate place to provide for a contingency strategy in case OE clearance becomes problematic. The contingency I would suggest is to allow approximately a 20-30 year period of HMP species reproduction and regrowth before clearing vegetation a 2nd time if OE clearance is interrupted and no longer feasible after the first clearance.

Response 11: A discussion of vegetation regrowth estimates was provided in Section 6.3.1.2 (OE Remedial Action Alternatives; Implementability), which indicated OE Remedial Action at each of the IA sites could be completed before vegetation grows back to a level that would make OE Remedial Action hazardous. Please see Response to BLM Comment 1 above regarding the size of the treatment areas. The cleanup of the IA sites will occur following a methodical approach (i.e. surface clearance of metal and OE, digital mapping the site, identifying specific anomalies for excavation, beginning excavations in the chaparral habitat before the other habitat types). This approach will ensure the cleanup will be completed before the habitat has reestablished. We recognize the importance of avoiding situations where the vegetation would have to be re-disturbed since several of the chaparral plants require many years before they reach maturity and produce seed.

IIF. COMMENTS FROM CALIFORNIA NATIVE PLANT SOCIETY, MONTEREY BAY CHAPTER, CARMEL, CALIFORNIA, DATED FEBRUARY 24, 2002

Thank you for the opportunity to comment on the draft final Interim Action RI/FS. My brief comments below are similar to those expressed by individual members, and represent the official position of the Monterey Bay Chapter California Native Plant Society (CNPS) as discussed and agreed upon at several CNPS Board of Directors' meetings.

CNPS supports the judicious use of prescribed fires and appreciates the Army's efforts to use all possible means to implement and monitor a safe and effective prescribed burn program. CNPS appreciates and has participated in several of the numerous and regular community forums held by the Army for public input on unexploded ordnance removal options that are safe for people and enhance habitat values as per the Fort Ord Habitat Management Plan.

CNPS agrees that burning would have a beneficial impact on the health and growth of plants and their stability. The number of roads/fuel breaks and their size, erosion, and invasive weeds are all concerns of which the Army is well aware, but warrant mention due to their potential to adversely affect rare plants and plant communities. These concerns are relevant to all of the vegetation clearance options (not just prescribed burning) addressed in the Interim Action RI/FS because all options will include significant ground disturbance and the need for many miles of fuel breaks and/or administrative roads.

Comment 1: **Fuelbreaks and erosion – Fuelbreaks, especially their roadbed portions, alter or remove native vegetation. Most erosion on Fort Ord is a result of roads and other human-disturbed areas. Therefore, as a guiding principle, CNPS suggests reducing the size and number of fuelbreaks to the minimum needed to safely conduct and contain burns. If the Army can effectively control a 485-acre prescribed burn (as suggested in the Interim RI/FS for Ranges 43-48) than that size of a burn would be supported by CNPS as compared to a number of smaller burns which would need more acres of fuelbreaks. Some significant erosion on Fort Ord has also resulted after fires when heavy rains occurred in undisturbed areas. Therefore CNPS suggests that specific mention in the Interim Action RI/FS and the subsequent proposed plan be given to the funding available and the erosion monitoring and corrective actions that will be taken if significant erosion occurs after vegetation clearance activities in the three proposed areas.**

Response 1: The Army acknowledges your comment and plans to consider smaller burns in the future, where practicable. Reducing the size of the cleanup site would require construction of new fuel breaks that would result in additional habitat loss, increase the risk of erosion and spread of invasive weeds, and cause additional adverse impacts to the rare maritime chaparral plant community. In addition, creation of smaller burn polygons would require many more burn days and result in smoke being in the air for more than the one to three days that is anticipated under the current plan. Furthermore, creating additional firebreaks within these polygons would require OE clearance in areas potentially heavily impacted by OE, and may be impractical. The methods to be used in conducting prescribed burns, pretreatment of fuel breaks with retardant, burning under ideal weather conditions, and use of helicopters, will enable the Army to control the fire. Roads and fuel breaks to support potential prescribed burns at OE-16, Range 30A and Ranges 43-48

have been created using the existing road and fuel break system. The existing roads were used to avoid impacting the rare species and their habitat as well as to minimize the risk of erosion and spread of invasive weeds. Maintenance of fuel breaks and control of invasive weeds will continue to be an Army land management requirement until the property is transferred to the future recipients.

Comment 2: **Fuel breaks and HMP plants – As the army knows well there are several HMP plant species that could be affected by fuel break installation and future maintenance within the 3 areas proposed for vegetation clearance. CNPS requests that the Interim RI/FS and the subsequent proposed plan specifically address properly timed surveys (e.g., during flowering season) and protective measures for HMP species such as sand gilia, Monterey spineflower and Seaside birdsbeak. These protective measures should include the following: mapped survey results of occupied and unoccupied habitat, alternatives to avoid direct impacts, and scheduled fuel break installation and maintenance to occur outside the growing season of these species.**

Response 2: Provisions are established to monitor habitats for five years following the cleanup to identify problems such as weed infestations during the habitat recovery. Weed and erosion control have been ongoing at former Fort Ord through an agreement with the Bureau of Land Management and California Department of Parks and Recreation since the base closed in 1994 and will continue until the property is transferred. The Army understands and agrees with your concern regarding impacts to protected species and will implement measures during fuel break installation and maintenance in a manner that will mitigate impacts to protected species to the maximum extent possible.

Comment 3: **Invasive weeds – Like erosion, the majority causes of invasive weed infestations on Fort Ord are along roads and other human-disturbed areas. CNPS applauds all the efforts the Army has undertaken to abate Fort Ord's invasive weeds. Again, as a guiding principle, CNPS suggests reducing the size and number of roads/fuelbreaks to the minimum needed to safely conduct and contain burns. A larger burn area requires fewer roads/fuelbreaks resulting in a reduction of disturbed habitat and weed invasion. Conversely, dividing large burn areas into several smaller burn areas would require a greater number of roads/fuelbreaks thus increasing disturbance and weed infestations. Monitoring for weeds is also important, therefore, CNPS suggests that specific mention of the amount of funding available for weed monitoring should be included in the Interim Action RI/FS and the subsequent proposed plan. Furthermore, these two documents need to address what invasive weed abatement actions will be taken if invasive weeds (such as annual grasses in chaparral) begin to establish after vegetation clearance activities in the three proposed areas.**

Response 3: Please see response to your Comment #1. Also, Section 6.3 states O&M costs over a monitoring period of five years are estimated for the prescribed burning, mechanical, and manual clearance alternatives. These cost estimates include not only habitat monitoring and reporting requirements, but also include the cost to implement erosion and invasive weed control measures. This cost is based on the historical expense of implementing the HMP during caretaker and pre-disposal actions.

Comment 4: **Finally, it is important to recognize that clearing maritime chaparral too frequently could damage rare plant populations. CNPS is concerned that, after initial vegetation clearance in the three proposed areas, there is the possibility that, for various reasons, significant regrowth of vegetation could prevent the completion of ordnance removal. CNPS would like the Army to be specific in the subsequent proposed plan that a 2nd vegetation clearance in any of the three areas would not occur until HMP species have the chance to reproduce and replenish their seed banks. This period of time should be two or more decades.**

Response 4: The cleanup of the IA sites will occur following a methodical approach (i.e., surface clearance of metal and OE, digital mapping the site, identifying specific anomalies for excavation, beginning excavations in the chaparral habitat before the other habitat types). This approach will ensure the cleanup will be completed before the habitat has reestablished. A discussion of vegetation regrowth estimates was provided in Section 6.3.1.2 (OE Remedial Action Alternatives; Implementability). We recognize the importance of avoiding situations where the vegetation would have to be re-disturbed since several of the chaparral plants require many years before they reach maturity and produce seed.

In closing, CNPS wishes to express thanks for all the Army and Base Realignment and Closure staff effort that has gone into the habitat management and base clean-up efforts at Fort Ord and for the exhaustive public outreach your staff has conducted.

IIG. COMMENTS FROM ROBERT HALE, MONTEREY, CALIFORNIA, DATED FEBRUARY 17, 2002

I strongly support the selection of prescribed burning as the alternative for vegetation clearance. Burning will have the greatest chance of preserving a healthy maritime chaparral at Fort Ord. I think the concerns about emissions have been adequately addressed and the proposed monitoring and mitigations are adequate.

Comment 1: **The potential short duration impacts of smoke should be compared to the chronic background level of fireplace smoke that exists for months in many local neighborhoods. How bad from an air quality perspective will a few days of burning really be?**

Response 1: The Army acknowledges your suggestion, and will consider the possibility of making such a comparison where data is available in the Operational Burn Plan.

Comment 2: **Regarding HMP species, a listing of fire dependent annuals would help to demonstrate the potential loss of diversity without burning. My observation in 1998 would include the following as heavily fire dependent:**

- **Phacelia grisea**
- **Phacelia brachyloba**
- **Silene multinerva**
- **Malacothrix clevelandis**
- **Papaver californicurn**
- **Artirhium kelloggic**

These annuals form dense, nearly carpet, displays in many areas amongst the burnt chaparral. Many other annuals including HMP species such as Gilia tenuiflora and Chorizanthe pungens are so large and prodigious following a fire. This implies that most of the seed bank production may occur following fires. Thus the diversity of species in maritime chaparral greatly depends on burning not only for number of species but also abundance. Prescribed burning is clearly the biologically superior alternative.

Response 2: The Army acknowledges your comment regarding prescribed burning's positive effects on the indicated species.

Comment 3: **Following burning sites should be actively monitored for invasive weed problems and removal prior to seed production a high priority of major invasive weeds such as Erichtites and thistles.**

Response 3: Provisions are established to monitor habitats for five years following the cleanup to identify problems such as weed infestations during the habitat recovery. Weed and erosion control have been ongoing at former Fort Ord through an agreement with the Bureau of Land Management and California Department of Parks and Recreation since the base closed in 1994 and will continue until the property is transferred. Invasive weed monitoring will be performed following OE remedial actions at the IA sites.

Comment 4: OE clearance work needs to focus on preventing the spread of non-native invasive weeds. You should include requirements to clean all equipment and clothing of potential weed seeds prior to operations in the ranges. This includes vehicles too.

Response 4: Please see Response to Comment 3 above.

Again thank you for your excellent work in support of prescribed burning.

IIH. COMMENTS FROM MONTEREY BAY UNIFIED AIR POLLUTION CONTROL DISTRICT, DATED FEBRUARY 11, 2002

The purpose of this letter is to provide our District's comments on the *Draft Final Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study for Ranges 43-48, Range 30A, Site OE-16, Former Fort Ord, California,* called hereafter the Draft Final IA RI/FS.

We note that several sections of the Draft Final IA RI/FS were rewritten and improved over the previous document, in response to previously submitted comments from this and other agencies.

General

In making these comments, it is important to note that it has been this agency's long-standing position that the Army:

- **Must treat the community's concern regarding health issues as a top priority;**
- **Conduct a complete and thorough analysis of the potential health impacts from the predicted air emissions from burning vegetation and ordnance; and**
- **Complete a comprehensive review, including a comparison of risk, of alternatives for clearing vegetation.**

These elements are necessary to assure that the Army makes its selection of vegetation clearance methods upon a sound and informed basis.

Unless otherwise specified, the section and page numbers refer to the Draft Final IA RI/FS.

Specific

Comment 1: §3.1.2, pg. 4: It would be worthwhile to note the fact that no depleted uranium-containing OE were used onsite, since these seem to be objects of particular concern for the community.

Response 1: Depleted uranium is a highly regulated, controlled material. All use and possession of depleted uranium within the Department of Defense (DoD) must comply with the licensing guidelines established by the Nuclear Regulatory Commission (NRC), or otherwise approved for use by DoD. The Army currently has 14 individual NRC licenses issued directly to each organization responsible for the management of depleted uranium. Only three depleted uranium training items, which were similar to artillery rounds, were used at Fort Ord to train soldiers for proper weapons set-up at ranges. The strictly controlled training rounds were never fired and were always brought back to Building 3708 when not in use. Building 3708 has been surveyed for radiological contamination and no residual contamination from the use of depleted uranium was found. Your suggestion will be considered in future descriptions that summarize what types of OE were typically used at Fort Ord as part of the basewide OE RI/FS.

Comment 2: **Table, p. 42: From our records, the acres burned in 1997 was approximately 700 acres, which included portions of OE-10A burned during an escaped fire. Also, in 1999 approximately 100 acres burned in a detonation-ignited wildfire. These incidences of fire escapes are important to note from the safety aspect.**

Response 2: In 1997, the acreage burned was estimated visually from a helicopter. Since then, the area burned has been mapped and incorporated into the Army's Geographical Information System, and acreage was calculated to be approximately 400 acres. The table did not include any wildfire incidents.

Comment 3: **§6.3, first bullet, p. 57: In combining the nine criteria into three categories, the importance of certain criteria may be minimized.**

Response 3: The Army acknowledges your concerns regarding the importance of each of the nine EPA criteria. Grouping the nine criteria into three categories allowed for streamlining the evaluation of alternatives for each of the three steps of cleanup (vegetation clearance, OE remedial action and detonation of OE). Proper weight is given to each evaluation criteria consistent with their categorization in the National Contingency Plan: (1) overall protection of human health and the environment and compliance with ARARs are threshold criteria that must be met, (2) long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost are primary balancing criteria, and (3) state and community acceptance are modifying criteria that will be considered in remedy selection.

Comment 4: **§6.3.1.1.1, last paragraph, p. 58: The Army has insisted that the emission calculations in this document should only reflect the increment that the OE would contribute, because the rest of the material which will be burned, i.e., normal vegetation, should be treated as a normal prescribed burn. The District has always urged that specific presentation of expected impacts from the prescribed burning is essential to the Army's ability to make informed decisions. Furthermore, under the revised State requirements for smoke management from prescribed burns, the emissions from burning vegetation are required to be calculated and smoke sensitive areas determined prior to burns being conducted. There are also requirements for monitoring smoke for large prescribed burns, such as would be conducted for Ranges 43-48. Where in the RI/FS process will the requirements for smoke management planning and monitoring be met?**

Response 4: A smoke management plan consistent with California Code of Regulations Title 17 will be included in the Operational Burn Plan. An air monitoring plan will also be prepared prior to a burn. These plans will be generated as part of the remedial design stage of the RI/FS process.

Comment 5: **§6.3.1.2.1, last paragraph, p. 60: "Burning would be somewhat difficult to implement from an administrative perspective because of air quality and some public concerns . . . " is a serious understatement of the magnitude of the difficulty and public concerns. Also, the importance of planning and preparation prior to the burns being conducted is not emphasized as it should be. The success of being able to conduct the burns without serious adverse impacts will not be possible without such pre-burn efforts.**

Response 5: The Army acknowledges your concerns about the importance of planning and preparation prior to prescribed burning, and is committed to conducting these activities in close coordination with the regulatory agencies and public to minimize potential impacts.

Comment 6: §6.3.2.1.1, second to last paragraph, p. 64: The importance of planning and preparation prior to the burns being conducted is not emphasized as it should be. The success of being able to conduct the burns without serious adverse impacts will not be possible without such pre-burn efforts.

Response 6: The Army acknowledges your concerns about the importance of planning and preparation prior to prescribed burning, and is committed to conducting these activities in close coordination with the regulatory agencies and public to minimize potential impacts.

Comment 7: §6.3.2.2.1, end of first paragraph, p. 66: See comment on §6.3.1.2.1.

Response 7: The Army acknowledges your concerns about the importance of planning and preparation prior to prescribed burning, and is committed to conducting these activities in close coordination with the regulatory agencies and public to minimize potential impacts.

Comment 8: §6.3.3.1.1, second to last paragraph, p. 70: See comment on §6.3.2.1.1.

Response 8: The Army acknowledges your concerns about the importance of planning and preparation prior to prescribed burning, and is committed to conducting these activities in close coordination with the regulatory agencies and public to minimize potential impacts.

Comment 9: §6.3.3.2.1, end of first paragraph, p. 72: See comment on §6.3.1.2.1.

Response 9: The Army acknowledges your concerns about the importance of planning and preparation prior to prescribed burning, and is committed to conducting these activities in close coordination with the regulatory agencies and public to minimize potential impacts.

Comment 10: §7, and Summary Tables, in general: In using effectiveness as an evaluation category, there is no explanation of the ranking of the criteria, including adverse health and environmental impacts (criteria 1) and community acceptance (criteria 9), which were included in the category.

Response 10: Please see Response to Comment 3 above. The Proposed Plan and ROD will contain separate discussions of the criteria, including community and State acceptance, which will be determined after the IA OE RI/FS and Proposed Plan have been reviewed by the public and regulatory agencies.

Comment 11: Table 5, p. 1 or 11: We disagree with the conclusion that Title 17, CCR §80100 et seq. is not an ARAR. In particular, §80160 (Special Requirements for Prescribed Burning and Prescribed Fires in Wildland and Wildland/Urban Interface Areas) and its subsections provide specific planning requirements for the type of burning that could be conducted at the former Ft. Ord. Similar to the "Interim Air Quality Policy on Wildland and Prescribed Fires", this regulation provides guidance and requirements necessary for planning prescribed burns.

Response 11: The referenced regulations will be considered as a relevant and appropriate ARAR. The Army will comply with substantive elements of the regulations. Under CERCLA, the Army is not required to comply with procedural and administrative provisions; however those elements will be addressed as part of the interim remedial design/remedial action process.

Comment 12: Table 6, column 3 "Prescribed Burning", p. 2 of 2: We disagree with the ease of implementation. Please see previous comments on §6.3.1.2.1.

Response 12: Please see Response to Comment 5 above.

Comment 13: Table 9, column 2 "Prescribed Burning", p. 1 of 1: We disagree with the ease of implementation. Please see previous comments on §6.3.1.2.1.

Response 13: Please see Response to Comment 5 above.

Comment 14: Appendix D, Response to District Comment 8, p. D29: We disagree that the extent of contribution of IA activities cannot be calculated. The emission inventory for prescribed burns that is part of the adopted Air Quality Maintenance Plan for this air basin is 11.8 TPD for volatile organic gases and 3.0 TPD for NOx. There are standard emission factors that may be used to estimate these emissions for all prescribed burns, based on vegetation type.

Response 14: Air emission estimates for a prescribed burn on Ranges 43 - 48 are included in "Technical Memorandum, Air Emissions from Incidental Ordnance Detonation During a Prescribed Burn on Ranges 43 through 48, Former Fort Ord, California" (*Harding ESE, 2001c*). However, the effect of emissions on regional air quality is not directly proportional to the quantity of emissions. Factors such as meteorological conditions during a prescribed burn will significantly affect the downwind concentrations of smoke. On any given day, the emission inventory for volatile organic gases and NOx from the District's Air Quality Maintenance Plan may or may not represent amounts which would cause an exceedance of an ambient air quality standard. The Army maintains that the ambient air quality standards themselves are not ARARs, but rather the source-specific rules and regulations that were established to achieve those standards could become ARARs.

Thank you for providing this opportunity to comment on the Draft Final IA RI/FS. If you require further details on our comments, please contact Amy Taketomo at our District offices.

DISTRIBUTION

Final
Interim Action Ordnance and Explosives
Remedial Investigation/Feasibility Study
For Ranges 43-48, Range 30A, Site OE-16
Former Fort Ord, California

March 7, 2002

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Quality Control Reviewer

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