

FORA ESCA REMEDIATION PROGRAM

FINAL

Group 1

Remedial Investigation / Feasibility Study Work Plan

Volume 1 - Work Plan

**Seaside Munitions Response Area and
Parker Flats Munitions Response Area Phase II**

Former Fort Ord
Monterey County, California

December 17, 2008

Prepared for:

FORT ORD REUSE AUTHORITY

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**Group 1 Remedial Investigation/Feasibility Study Work Plan
Volume 1 – Work Plan
Former Fort Ord
Monterey County, California**




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ACRONYMS AND ABBREVIATIONS

ACES	Areas Covered by Environmental Services
AOC	Administrative Order on Consent
ARARs	applicable or relevant and appropriate requirements
Army	United States Department of the Army
BADT	best available and appropriate detection technology
bgs	below ground surface
BO	Biological Opinion
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIOP	Community Involvement and Outreach Program
CRP	Community Relations Plan
CSM	Conceptual Site Model
CSUMB	California State University Monterey Bay
DGM	digital geophysical mapping
DMM	discarded military munitions
DOD	United States Department of Defense
DOJ	Department of Justice
DQOs	Data Quality Objectives
DTSC	Department of Toxic Substances Control
EDC	Economic Development Conveyance
ENRD	Environmental and Natural Resources Division
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
ESCA	Environmental Services Cooperative Agreement
ESCA RP	Environmental Services Cooperative Agreement Remediation Program
FS	Feasibility Study
FFA	Federal Facility Agreement
FORA	Fort Ord Reuse Authority
FOSET	Findings of Suitability of Early Transfer
FWS	United States Fish and Wildlife Service
G1 SAP	Group 1 Sampling and Analysis Plan
GIS	Geographical Information System
HFA	Human Factors Applications, Inc.
HMP	Habitat Management Plan
HTRW	hazardous, toxic, and radioactive waste
LFR	LFR Inc.

MEC	Munitions and Explosives of Concern
MMRP	Military Munitions Response Program
MRA	Munitions Response Area
MRS	Munitions Response Site
msl	mean sea level
NPL	National Priorities List
NTCRA	Non-Time-Critical Removal Action
PA	Programmatic Agreement
PRGs	preliminary remediation goals
PWP	Programmatic Work Plan
QA	quality assurance
QA/QC	quality assurance/quality control
QC	quality control
QAPP	Quality Assurance Project Plan
RAOs	Remedial Action Objectives
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROD	record of decision
RQA	Residential Quality Assurance
RWQCB	Regional Water Quality Control Board
SAP	Sampling and Analysis Plan
SCAs	Special Case Areas
SEDR	Summary of Existing Data Report
SOP	standard operating procedure
TBC	to-be-considered criteria
TRC	Technical Review Committee
TSRS	Technical Specifications and Requirement Statement
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
UXO	unexploded ordnance
Westcliffe	Westcliffe Engineers, Inc.
WESTON	Weston Solutions, Inc.

GLOSSARY

Anomaly

Any item that is seen as a subsurface irregularity after geophysical investigation. This irregularity should deviate from the expected subsurface ferrous and non-ferrous material at a site (i.e., pipes, power lines, etc.).

Anomaly Avoidance

Techniques employed by unexploded ordnance (UXO) personnel at sites with known or suspected munitions and explosives of concern (MEC) to avoid any potential surface MEC and any subsurface anomalies. This usually occurs at mixed hazard sites when hazardous, toxic, and radioactive waste hazardous, toxic, and radioactive waste (HTRW) investigations must occur prior to execution of an MEC removal action. Intrusive anomaly investigation is not authorized during ordnance avoidance operations.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980

CERCLA authorizes federal action to respond to the release or threatened release of hazardous substances into the environment or a release or threatened release of a pollutant or contaminant into the environment that may present an imminent or substantial danger to public health or welfare.

Construction Support

Support provided by qualified UXO personnel during construction activities at potential MEC sites to reduce the potential for exposure to MEC. When a determination is made that the probability of encountering MEC is low (i.e., current or previous land use leads to an initial determination that MEC may be present), only MEC safety support is required. When a determination is made that the probability of encountering MEC is moderate to high (current or previous land use leads to an initial determination that MEC was employed or disposed of in the area of concern), UXO teams are required to conduct subsurface MEC clearance of the known construction footprint either in conjunction with the construction contractor or prior to construction intrusive activities. The level of effort will be determined on a case-by-case basis.

Covenant Deferral Request

A letter along with a supporting information package known as a Covenant Deferral Request (CDR) is assembled by the Federal landholding to formally request deferral of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) covenant until that all remediation has been accomplished prior to transfer. United States Environmental Protection Agency (EPA) requires that the information is: 1) of sufficient quality and quantity to support the request for deferral of the CERCLA Covenant; and 2) that it provides a basis for EPA to make its determination. This information is submitted to EPA in the form of a CDR.

Deferral period

The period of time that the CERCLA covenant warranting that all remedial action is complete before transfer, is deferred through the Early Transfer Authority.

Discarded Military Munitions (DMM)

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

Early Transfers

The transfer by deed of federal property by United States Department of Defense (DOD) to a nonfederal entity before all remedial actions on the property have been taken. Section 120 (h)(3)(C) of the CERCLA allows Federal agencies to transfer property before all necessary cleanup actions have been taken. This provision, known as early transfer authority, authorizes the deferral of the CERCLA covenant when the findings required by the statute can be made and the response action assurances required by the statute are given. The Governor of the state where the property is located must concur with the deferral request for property not listed on the National Priorities List (NPL). For NPL property, the deferral must be provided by the EPA with the concurrence of the Governor. Upon approval to defer the covenant, DOD may proceed with the early transfer.

ESCA RP Team

LFR Inc., Weston Solutions, Inc., and Westcliffe Engineers, Inc.

Exclusion Zone

A safety zone established around an MEC work area. Only essential project personnel and authorized, escorted visitors are allowed within the exclusion zone. Examples of exclusion zones are safety zones around MEC intrusive activities and safety zones where MEC is intentionally detonated.

Explosive

Includes items designed to cause damage to personnel or material through explosive force that may be accomplished by bombs, warheads, missiles, projectiles, rockets, antipersonnel and antitank mines, demolition and spotting charges, grenades, torpedoes and depth charges, high explosives and propellants, fuses from practice items, and all similar and related items or components explosive in nature.

Feasibility Study (FS)

The primary objective of the FS is “to ensure appropriate remedial alternatives are being developed and evaluated and an appropriate remedy selected” [NCP 40 CFR 300.430(e)].

Geophysical Reacquisition

Geophysical Reacquisition involves utilizing both a positioning method (i.e., Global Positioning System [GPS], ultrasonic, or tape from corners) and geophysical instruments to reacquire and pinpoint anomaly locations selected by the geophysical processors. The geophysical instruments include the original instrument used for the digital survey of the grid and the analog instrument being utilized by the UXO teams for intrusive activities. The intended result of this method is to pinpoint the location where the intrusive teams will find the subsurface item causing the anomaly.

Intrusive Activity

An activity that involves or results in the penetration of the ground surface at an area known or suspected to contain MEC. Intrusive activities can be of an investigative or removal action nature.

mag and dig

Utilizing hand held geophysical instruments to detect anomalies and immediately investigating the anomalies (without using collection of digital data and post processing to determine which anomalies to dig) by manual digging or with the assistance of heavy equipment

Material Potentially Presenting an Explosive Hazard (MPPEH)

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

Memorandum of Agreement (MOA)

“Memorandum of Agreement Among the Fort Ord Reuse Authority, Monterey County and Cities of Seaside, Monterey, Del Rey Oaks and Marina, California State University Monterey Bay, University of California Santa Cruz, Monterey Peninsula College, and the Department of Toxic Substances Control Concerning Monitoring and Reporting of Environmental Restrictions on the Former Fort Ord, Monterey County, California”

Military Munitions

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

Military Munitions Response Program

Department of Defense-established program that manages the environmental, health and safety issues presented by munitions of explosives concern.

Minimum Separation Distance (MSD)

MSD is the distance at which personnel in the open must be from an intentional or unintentional detonation.

Munitions and Explosives of Concern (MEC)

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

Munitions Constituents (MC)

Any materials originating from UXO, discarded military munitions, or other military munitions, including explosive and nonexplosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions (10 U.S.C. 2710).

Munitions Debris (MD)

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

Munitions Response Area (MRA)

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

Munitions Response Site (MRS)

A discrete location within an MRA that is known to require a munitions response.

Ordnance and Explosives (OE)

See MEC.

Quality Assurance (QA)

An integrated system of management activities involving planning, implementation, assessment, reporting, and quality improvement to ensure that a process, item, or service is of the type and quality needed to meet project requirements.

Quality Control (QC)

The overall system of operational techniques and activities that measures the attributes and performance of a process, item, or service against defined standards that are used to fulfill requirements for quality.

Record of Decision (ROD)

An ROD is the document used to record the remedial action decision made at a National

Priorities List property. The ROD will be maintained in the project Administrative Record and project file.

Remedial Investigation (RI)

The RI is intended to “adequately characterize the site for the purpose of developing and evaluating an effective remedial alternative” (NCP, 40 CFR 300.430(d)). In addition, the RI provides information to assess the risks to human health, safety, and the environment that were identified during risk screening in the site investigation.

Remedial Actions

Those actions consistent with a permanent remedy taken instead of or in addition to removal actions in the event of a release or threatened release of a hazardous substance into the environment, to prevent or minimize the release of hazardous substances so that they do not migrate to cause substantial danger to present or future public health, welfare, or the environment. The term includes but is not limited to such actions at the location of the release as storage; confinement; perimeter protection using dikes, trenches, or ditches; clay cover; neutralization; cleanup of released hazardous substances and associated contaminated materials; recycling or reuse; diversion; destruction; segregation of reactive wastes; dredging or excavations; repair or replacement of leaking containers; collection of leachate and runoff; on-site treatment or incineration; provision of alternative water supplies; and any monitoring reasonably required to assure that such actions protect the public health, welfare, and the environment. The term includes the costs of permanent relocation of residents and businesses and community facilities where the President of the United States determines that, alone or in combination with other measures, such relocation is more cost-effective and environmentally preferable to the transportation, storage, treatment, destruction, or secure disposition off site of hazardous substances, or may otherwise be necessary to protect the public health or welfare. The term includes off-site transport and off-site storage, treatment, destruction, or secure disposition of hazardous substances and associated contaminated materials.

Response Action

Action taken instead of or in addition to a removal action to prevent or minimize the release of MEC so that it does not cause substantial danger to present or future public health or welfare or the environment.

Unexploded Ordnance (UXO)

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

UXO Technicians

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

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EXECUTIVE SUMMARY

Introduction and Purpose

This Group 1 Remedial Investigation/Feasibility Study (RI/FS) Work Plan (“the Group 1 RI/FS Work Plan”) describes the cleanup of munitions and explosives of concern (MEC) on portions of the former Fort Ord in Monterey County, California (Figure 1). Group 1 consists of the Seaside and Parker Flats Munitions Response Areas (MRAs; Figure 2). The objective of this Group 1 RI/FS Work Plan is to outline the steps that will be taken to: 1) gather data to fully characterize the Phase II areas of the Parker Flats MRA (“Parker Flats MRA Phase II”); 2) assess explosives safety risk that may be present at the Group 1 MRAs; and 3) evaluate alternatives under the RI/FS process to reduce the potential explosives safety risk to current and future property owners and the general public within the Group 1 MRAs.

This Group 1 RI/FS Work Plan describes: 1) the proposed methodology to obtain the necessary information to fill data gaps identified for the Parker Flats MRA Phase II; 2) the proposed methodology to assess the quality and quantity of existing and future data that will be used to assess explosives safety risks that may be present at the Group 1 MRAs; and 3) the steps that will be taken to evaluate alternatives under the RI/FS process to reduce the potential explosives safety risk.

The information obtained during the Group 1 RI/FS Work Plan effort will be used to complete the RI/FS and characterize the nature and extent of MEC in order to propose a preferred remediation alternative for the Group 1 MRAs pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The information and evaluation will be presented in a Group 1 RI/FS report. The Group 1 RI/FS Work Plan outlines the specific RI/FS tasks that will be performed to make decisions regarding risk and remedial actions during the RI/FS, as defined by the Administrative Order on Consent (AOC). The AOC tasks presented in the Group 1 RI/FS Work Plan are consistent with those provided in the U.S Environmental Protection Agency’s (EPA’s) current RI/FS guidance document.

An initial evaluation of the data for the Group 1 MRAs was conducted as part of the Summary of Existing Data Report, and the results identified initial data gaps for portions of the Seaside and Parker Flats MRAs. To address these data gaps, additional field investigation activities were proposed for the Special Case Areas previously identified by the United States Department of the Army within the Seaside MRA (Figure 3) and the Phase II areas of the Parker Flats MRA (Figure 4). Field activities and data collection related to the Seaside MRA removal action are currently being conducted under a site-specific work plan that was reviewed and approved by the regulatory agencies. Field activities, data collection, and data management associated with the Parker Flats MRA Phase II will be conducted in accordance with the plans and standard operating procedures contained in Volume 2 of this Group 1 RI/FS Work Plan. The results of the Seaside MRA removal action and the Parker Flats MRA investigations will be incorporated into the RI/FS report for the Group 1 MRAs.

Work Plan Organization

The Group 1 RI/FS Work Plan has been divided into two volumes. Volume 1 provides a rationale for the work plan approach including data analysis and validation, summarizes the tasks required to complete the Group 1 RI/FS, and presents an outline for the RI/FS report and an anticipated project schedule for Group 1 field activities and document preparation. Volume 2 presents the Group 1 Sampling and Analysis Plan (G1 SAP) and describes the procedures, methods, and resources that will be used to conduct the field activities associated with the MEC remedial investigation within the Parker Flats MRA Phase II. Additionally, Volume 2 includes a description of the process, procedures, and success criteria for the Residential Quality Assurance (RQA) Pilot Study.

Remedial Investigation and Feasibility Study (Volume 1)

Volume 1 presents the tasks to be performed to complete the RI/FS process, including nature and extent of MEC contamination, a baseline risk assessment, and a feasibility study (FS) for the Group 1 MRAs. In order to complete the RI/FS process for the Group 1 MRAs, an assessment of the risk of explosive hazard is required. To properly assess explosives safety risks that may be present at the Group 1 MRAs and to recommend an appropriate remedial alternative, the quality and quantity of existing data for the Group 1 MRA, as well as the quality of data collected in the future, must be evaluated. Following the completion of field activities and data collection within the Seaside and Parker Flats MRAs, the newly collected data and the existing data will be further analyzed to confirm whether the data are of sufficient quality to support an evaluation of alternatives for the FS and whether the removal data are sufficient to be used to support explosives safety risk management decision making.

If the data are determined to be sufficient, the Group 1 MRAs will proceed to the risk assessment phase. The explosives safety risk assessment will be conducted using the specific protocol previously developed to evaluate current and future explosives safety risks at the former Fort Ord. The Fort Ord Ordnance and Explosives Risk Assessment Protocol allows for a comparative review of MEC risks at affected sites. Once the baseline risk is evaluated, remedial action alternatives will be developed and evaluated in the FS against the nine CERCLA criteria to identify whether remedial action (e.g., further MEC removal and/or land use controls) will be necessary to mitigate any unacceptable risks. The RI/FS tasks that will be performed to make decisions regarding risk and remedial actions during the Group 1 RI/FS were defined by the AOC and are consistent with those provided in the EPA's current RI/FS guidance document.

Sampling and Analysis Plan (Volume 2)

The G1 SAP describes the procedures, methods, and resources that will be used to conduct the field activities associated with the MEC remedial investigation (RI) in the Phase II portion of the Parker Flats MRA. Additionally, the G1 SAP outlines the process, procedures, and success criteria for the RQA Pilot Study.

The Parker Flats MRA Phase II areas proposed for investigation in the G1 SAP include Parcels E18.1.1, E18.1.2, E18.1.3, E18.4, E19a.1, E19a.2, E20c.2, and portions of E19a.3 and E19a.4. The objective of this RI is to fill data gaps prior to conducting the risk assessment as part of the RI/FS.

The investigation areas identified in the G1 SAP include property within the Parker Flats MRA Phase II that is designated for future reuse as residential, nonresidential, or habitat reserve. Digital geophysical mapping (DGM) investigations, using the best available and appropriate detection technology (BADT), will be performed in areas designated for future residential and nonresidential reuse. Areas that are not suitable for DGM will be investigated using analog BADT.

Investigation of habitat reserve areas will be conducted using two separate investigation methods. The highest risk areas, specifically trails and open areas adjacent to the trails, will be investigated by performing DGM investigations, or investigations using the BADT similar to the future residential and nonresidential areas. The investigation on trails will entail 100 percent DGM investigations to the depth of detection. The remaining habitat reserve areas will be investigated using analog instrument-aided surface and near-surface (within 3 inches) survey investigation methods. The purpose of the surface sweep in the habitat reserve areas will be to identify and remove anomalies that are on or near the surface (within 3 inches). Surface and near-surface finds (MEC and MD) will be fully documented and reviewed by the ESCA RP Team in consultation with the regulatory agencies during the investigation. If the ESCA RP Team in consultation with the regulatory agencies determine that significant near-surface MEC (either high concentration or high-risk unexploded ordnance) has been discovered during the investigation, a field variance will be developed to change the investigation approach to include a focused intrusive investigation to ascertain the limits of the condition. After DGM data are processed, anomalies will be reacquired for excavation and removal.

Fieldwork will be conducted in accordance with the health and safety requirements identified in the explosives siting plan and the site specific safety and health plan presented in the G1 SAP. MEC will be handled, stored, and transported in accordance with the guidelines set forth in the explosives management plan, which are based on federal regulations. Data will be collected and managed (including validation and quality control) in accordance with the quality control procedures outlined in the G1 SAP.

RQA Pilot Study (Volume 2)

The RQA Pilot Study has been prepared to assess the relevance and usefulness of the quality assurance process that has been developed to address regulatory agency concerns regarding the residual risk that remains after MEC removals have taken place, particularly in areas that are designated for future residential use (i.e., unrestricted land use). Because the majority of land identified for future residential use is located within the Seaside MRA and the California State University Monterey Bay (CSUMB) Off-Campus MRA (formerly referred to as the CSUMB MRA), these two MRAs have been selected as the appropriate test areas to conduct the RQA Pilot Study.

Areas in the CSUMB Off-Campus MRA and the Seaside MRA were identified as appropriate test areas. These areas have previously undergone response actions and exhibited relatively high densities of MEC with a variety of hazard classifications. Prior to the study, the areas will be cleared of vegetation, as appropriate, and geophysically investigated using the BADT instrumentation. Anomaly reacquisition and excavation will be conducted in accordance with the procedures outlined in the G1 SAP. The data will be analyzed and the results will be presented in a Technical Memorandum, which will also include an evaluation of the success of the RQA Pilot Study.

1.0 INTRODUCTION

The former Fort Ord is located near Monterey Bay in the northwestern Monterey County, California. Since 1917, portions of the former Fort Ord were used by infantry units for maneuvers, target ranges, and other purposes. Military munitions were fired into, fired upon, or used on the facility in the form of artillery and mortar projectiles, rockets, and guided missiles, rifles and hand grenades, land mines, pyrotechnics, bombs, and demolition materials. Some of these military munitions are still present at the former Fort Ord as either Munitions and Explosives of Concern (MEC) or munitions debris (MD).

This Group 1 Remedial Investigation / Feasibility Study (RI/FS) Work Plan (“the Group 1 RI/FS Work Plan”) was prepared by the Environmental Services Cooperative Agreement Remediation Program (ESCA RP) Team (“the ESCA RP Team”) on behalf of the Fort Ord Reuse Authority (FORA) in compliance with an Administrative Order on Consent (AOC), which addresses cleanup of portions of the former Fort Ord in Monterey County, California (Figure 1). Group 1 includes the Seaside and Parker Flats Munitions Response Areas (MRAs; Figure 2). The ESCA RP Team consists of FORA’s contractors: LFR Inc. (LFR), Weston Solutions, Inc. (WESTON), and Westcliffe Engineers, Inc. (Westcliffe).

The AOC was entered into voluntarily by the United States Environmental Protection Agency (EPA) Region 9, the Department of Toxic Substances Control (DTSC), FORA, and the United States Department of Justice (DOJ) Environment and Natural Resources Division (ENRD; EPA Region 9 CERCLA Docket No. R9-2007-03). This AOC was issued under the authority vested in the President of the United States by Sections 104, 106, and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, 42 United States Code (U.S.C.) §§ 9604, 9606, and 9622.

This effort was sponsored by the Army, Assistant Chief of Staff Installation Management. The content of the information does not necessarily reflect the position or policy of the Government and no official endorsement should be inferred.

1.1 Work Plan Purpose

The purpose of the Group 1 RI/FS Work Plan as defined under Task 3 of the AOC Scope of Work is to propose methodology to obtain the necessary information identified in the Summary of Existing Data Report (SEDR) to characterize the nature and extent of MEC in order to propose a preferred remediation alternative pursuant to CERCLA. In compliance with AOC paragraph 25, at a minimum, the Group 1 RI/FS Work Plan includes plans and schedules for the following activities:

- Collection of data necessary to characterize conditions under investigation
- Risk assessment
- Development and screening of a range of possible remedial alternatives
- Detailed analysis of alternatives

- Development of sufficient information to enable the United States Department of the Army (Army) and/or EPA to select appropriate remedies for each parcel comprising the site

The results of the above activities will be documented in the RI/FS report for use by the Army in developing the Proposed Plan and making a remedial action decision.

1.2 Work Plan Objectives

The objectives of the Group 1 RI/FS Work Plan are to:

- Present the overall RI/FS process for MEC remediation within the Group 1 MRAs
- Provide background information on the Group 1 MRAs as it relates to MEC
- Summarize previous and ongoing MEC investigations, sampling, and/or removal actions in the Group 1 MRAs
- Describe the investigative approaches to collect the data necessary to address data gaps concerning the nature and extent of MEC
- Provide an initial evaluation of the nature and extent of MEC in the environment and identify the potential receptors and routes of exposure to MEC hazards
- Document data requirements for explosives safety risk and response alternative evaluations
- Identify a process for conducting and evaluating a Residential Quality Assurance (RQA) Pilot Study

1.3 Former Fort Ord Munitions Response Program

This section summarizes the munitions response program related to MEC cleanup that was previously implemented at the former Fort Ord by the Army and the subsequent program that was implemented to continue MEC remediation in portions of the former Fort Ord by FORA.

1.3.1 Cleanup Program Under the Army

The former Fort Ord was placed on the National Priorities List (NPL) in 1990, primarily because of chemical contamination in soil and groundwater that resulted from past Army occupation. To oversee the cleanup of the base, the Army, DTSC, Monterey Bay Regional Water Quality Control Board (RWQCB), and EPA entered into a Federal Facility Agreement (FFA). One of the purposes of the FFA is to ensure that the environmental impacts associated with past and present activities at the former Fort Ord are thoroughly investigated and appropriate remedial action taken as necessary to protect the public health and the environment. In accordance with the FFA, the Army is designated as the lead agency under CERCLA for conducting environmental investigations, making cleanup decisions, and taking cleanup actions at the former Fort Ord. The EPA is designated as the lead regulatory agency for the cleanup while the DTSC and RWQCB are supporting agencies.

Since the Base Realignment and Closure (BRAC) listing and closure of Fort Ord, cleanup operations have been performed to address the presence of MEC and to prepare former Fort Ord property for transfer to federal, state, and local agencies and the surrounding Monterey County communities. The Army conducted a number of MEC survey and clearance activities, including geophysical surveys. The Army performed its activities pursuant to the President of the United States' authority under CERCLA Section 104, as delegated to the Army in accordance with Executive Order 12580 and in compliance with the process set out in CERCLA Section 120.

In November 1998, the Army agreed to evaluate MEC at the former Fort Ord and perform a base-wide Munitions Response RI/FS consistent with CERCLA. The base-wide RI/FS program addressed MEC hazards on the former Fort Ord and evaluated past removal actions as well as recommended future remedial actions deemed necessary to protect human health and the environment under future uses. In April 2000, an agreement was signed between the Army, EPA, and DTSC to evaluate MEC at the former Fort Ord subject to the provisions of the FFA. The signatories agreed that the FFA provided the appropriate framework and process to address the Army's MEC activities. The FFA established schedules for performing RI/FSs, and required that remedial actions be completed expeditiously.

The Army's approach to categorizing areas within the former Fort Ord includes track groupings consisting of Track 0 through Track 3. Specifically, track definitions are as follows:

- Track 0: Areas that contain no evidence of MEC and have never been suspected of having been used for military munitions-related activities.
- Track 1: Sites where military munitions were suspected to have been used but, based on results, the sites fall into one of three categories: 1) sites with no evidence to indicate that military munitions were used; 2) sites used for training but military munitions used do not pose an explosive hazard; or 3) sites used for training but military munitions potentially remaining do not pose an unacceptable risk.
- Track 2: Sites where MEC were present and MEC removal has been conducted.
- Track 3: Sites where MEC are known or suspected but investigations have not been initiated or completed.

In addition, to remain consistent with the federal Endangered Species Act (ESA), the Army has completed consultations with the United States Fish and Wildlife Service (FWS) on the Army's predisposal actions, including cleanup of MEC. These consultations have resulted in biological opinions (BOs) that include endangered species incidental take permits. These permits allow impacts to and incidental take of listed species during MEC cleanup activities, but require mitigation measures to be implemented during the MEC cleanup activities to reduce and minimize impacts to the protected species and their habitats.

1.3.2 Process for Early Transfer of Former Fort Ord Property

The transfer of a portion of the former Fort Ord, pursuant to CERCLA Section 120(h)(3)(C), was requested by FORA in a letter dated May 18, 2005. Under CERCLA Section 120(h)(3), the United States is required to provide a covenant in deeds conveying the property, warranting that all remedial action necessary to protect human health and the environment has been taken before the date of transfer. For a federal facility listed on the NPL, CERCLA Section 120(h)(3)(C) allows the EPA Administrator, with concurrence of the governor of the state, to defer the CERCLA covenant requirement. These types of transfers under CERCLA Section 120(h)(3)(C) are typically called “Early Transfers,” in which the United States provides the warranty after transfer of the property when all of the response actions necessary to protect human health and the environment have been taken. The period between the transfer of title and the making of this final warranty is known as the “deferral period.” Early Transfers allow productive reuse of the property through access while final remediation work is being conducted.

The EPA Administrator, with the concurrence of the governor of the state in which the property is located, may defer the CERCLA warranty requirement if the property is determined to be suitable for transfer. In addition, United States Department of Defense (DOD) and Army policy require that the Military Department proposing to transfer property prepare a Finding of Suitability for Early Transfer (FOSET). This FOSET will be submitted as part of the Covenant Deferral Request, in which the Army will seek approval by the EPA Administrator and concurrence by the governor of the state of the Early Transfer.

On March 31, 2007, the Army and FORA entered into an Environmental Services Cooperative Agreement (ESCA) to provide MEC remediation services during the deferral period, thereby allowing the Army to transfer approximately 3,340 acres of property and the responsibility of removing MEC to FORA as an Economic Development Conveyance (EDC). The former Fort Ord property being transferred under the ESCA is shown on Figure 1 and is collectively referred to as the Areas Covered by Environmental Services (ACES). In accordance with the ESCA, FORA is responsible for addressing all response actions for the property except for those responsibilities retained by the Army. To accomplish this effort, FORA entered into an agreement with the ESCA RP Team to assist in the completion of the MEC cleanup activities in accordance with the ESCA and the AOC. During the ESCA, FORA is responsible for administrative and management program elements, while the ESCA RP Team conducts the MEC remediation under FORA oversight.

1.3.3 FORA ESCA Remediation Program

As defined by the ESCA, the Army prepared a Technical Specifications and Requirement Statement (TSRS) to identify the general specifications for the environmental services to be conducted by FORA under the ESCA RP. The purpose of the ESCA RP is to provide the necessary environmental services to FORA, which include characterization, assessment of risk of explosive hazards, feasibility study (FS), remediation alternatives analysis, and performance of remediation of hazardous substances, including but not limited to MEC, which pose unacceptable risk to human health and the environment. A primary benefit of the

ESCA RP is to facilitate completion of these activities in a manner that is more expeditious than could be performed by the Army.

The primary objective of the ESCA RP is to complete a timely cleanup of the property in accordance with the ESCA and AOC, while promoting and enhancing the public health and safety of current and future users of the property. In addition, the ESCA RP allows remediation activities to be integrated with community reuse objectives, such as the construction of street improvements and backbone utility infrastructure.

1.4 Preliminary RI/FS Scoping and Implementation

Based on an evaluation of the available data, Conceptual Site Models (CSMs), preliminary assessments of risk, and regulatory pathway requirements, the nine MRAs were consolidated into four groups (i.e., Group 1 through Group 4). Each group consists of one or more MRAs that have similar pathway-to-closure characteristics. The four groups are shown on Figure 2. This work plan focuses on the Group 1 MRAs.

Group 1 includes the Seaside and Parker Flats MRAs (Figure 2). The Seaside MRA has been divided into two phases of work. The first phase was completed by the Army in 2004; however, approximately 35 acres of land within the Seaside MRA were designated by the Army as Special Case Areas (SCAs; Figure 3). The second phase of work, identified as the Phase II Seaside MRA Removal Action, is currently being conducted by FORA under the ESCA RP. The Phase II Seaside MRA Removal Action is designed to collect additional data to fill data gaps associated with the SCAs in support of the RI/FS process and to prepare the MRA for reuse. The Phase II Seaside MRA Removal Action is being conducted under the Final Site-Specific Work Plan Addendum (“the Final SSWP Addendum”), which was reviewed and approved by the regulatory agencies (ESCA RP Team 2008a). The results of the Phase II Seaside MRA Removal Action will be incorporated into the RI/FS report for Group 1.

The Parker Flats MRA has been divided into two phases of work, identified as Parker Flats MRA Phase I and Parker Flats MRA Phase II (Figure 4). The Army completed a Track 2 Munitions Response RI/FS report for the Parker Flats MRA Phase I (MACTEC 2006). The Army is also in the process of finalizing a Record of Decision (ROD) for the Parker Flats Phase I. Therefore, only the Parker Flats Phase II area is being considered in this work plan. The remediation plan documented in the Army ROD for the Phase I area will be implemented by the ESCA RP Team.

1.4.1 Summary of Existing Data Report

A SEDR was completed for the ACES by the ESCA RP Team as required under Task 2 of the AOC (ESCA RP Team 2008c). In the SEDR, ESCA parcels were combined into nine MRAs to facilitate the implementation of the AOC. The SEDR provided a site overview, evaluation of existing data, identification of data gaps, a CSM including an initial assessment of explosives safety risks, and proposed future use for each MRA. The SEDR also presented

conclusions and recommendations for further actions and formed the basis for the remedial investigation (RI) planning efforts.

One of the goals of the SEDR was to develop a process to complete the remaining steps in the sequence and phasing of the CERCLA activities, as described in the AOC, within Group 1. The overall process for navigating Group 1 through the CERCLA process and a detailed regulatory pathway to closure was developed and presented in the SEDR. The regulatory pathway for Group 1 considers the conclusions and recommendations presented in the CSMs for each of the Group 1 MRAs; the CSMs are discussed in more detail in Section 3.0 of this work plan.

The proposed pathway to closure for Group 1 is depicted on Figure 5. Group 1 enters the pathway beginning with preparation of a Non-Time-Critical Removal Action (NTCRA) and RI work plan and carrying the CERCLA process through the execution of a ROD. Because a substantial amount of investigation and removal action is anticipated to occur during the RI within Group 1, it is expected that the MEC data that are encountered during the RI stage will be comparatively small in quantity and of sufficient quality that we proposed to intrusively investigate all anomalies during the RI stage of the CERCLA process. This approach will allow the management of Group 1 through the CERCLA process with the goal of achieving a ROD that documents that no further remedial action is required (NFA ROD) with institutional controls. Following execution of the ROD, an Institutional Controls Implementation Plan will be prepared.

1.5 Work Plan Organization

This Group 1 RI/FS Work Plan was prepared in accordance with the EPA “Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA” (EPA 1988b). This Group 1 RI/FS Work Plan is organized in two volumes, which contain the following components:

Volume 1 – Work Plan

- **Executive Summary**
- **Section 1 – Introduction.** This section includes a general explanation of the reasons for the RI/FS and the expected results or goals.
- **Section 2 – Physical Setting and History.** This section provides an overview of the current understanding of the physical setting, history, and condition of the Group 1 MRAs.
- **Section 3 – Initial Evaluation.** This section presents an initial characterization of military training activities conducted within the Seaside and Parker Flats MRAs based on the information documented in the SEDR.
- **Section 4 – Work Plan Rationale.** This section presents the work plan approach, documentation of data requirements for both the explosives safety risk assessment and the alternatives evaluation, and an explanation of how RI/FS tasks will meet Data Quality Objectives (DQO) needs.

- **Section 5 – Group 1 RI/FS Tasks.** This section summarizes the 11 tasks for completing an RI/FS.
- **Section 6 – Scheduling and Reporting.** This section includes a generalized outline for the RI/FS report and an anticipated project schedule.
- **Section 7 – References.** This section provides a list of references to pertinent documents cited in this work plan.

Volume 2 – Sampling and Analysis Plan

- **Section 1 – Introduction.** This section includes the general purpose and scope of the Sampling and Analysis Plan (SAP).
- **Section 2 – Technical Management Plan.** This section outlines the procedures and methods that will be used to complete the field investigation removal activities.
- **Section 3 – Explosives Management Plan.** This section provides the minimum procedures and safety and health requirements applicable to the acquisition, storage, accountability, and transportation of demolition materials and MEC.
- **Section 4 – Explosives Siting Plan.** This section outlines the procedures that will be used to perform MEC identification, treatment operations, and storage of explosives.
- **Section 5 – Geophysical Investigation Plan.** This section outlines the geophysical surveys that will be conducted to establish and record the locations of geophysical anomaly targets and the RQA Pilot Study.
- **Section 6 – Site Safety and Health Plan.** This section establishes the general guidelines and procedures to ensure protection of personnel and the public while performing the field investigation and removal operations.
- **Section 7 – Location Surveys and Mapping Plan.** This section outlines the tools and methodologies that will be used for the efficient and accurate completion of surveying, mapping, and Geographical Information System (GIS) operations.
- **Section 8 – Work Management Plan.** This section provides an anticipated schedule for the completion of the activities presented in the SAP.
- **Section 9 – Property Management Plan.** This section provides procedures for the management of property during the project.
- **Section 10 – Sampling and Analysis Plan.** This section includes a summary of sampling and analysis procedures to be implemented during non-MEC related activities.
- **Section 11 – Quality Control Plan.** This section establishes and describes the quality requirements for completion of the field investigation and removal operations.
- **Section 12 – Environmental Protection Plan.** This section outlines the procedures that will be implemented to protect natural resources.
- **Section 13 – Investigation-Derived Waste Plan.** This section outlines the procedures for managing wastes that are generated during the field investigation and removal operations.

Section 1 – Introduction

- **Section 14 – References.** This section provides a list of references to pertinent documents cited in the G1 SAP.

2.0 HISTORY AND PHYSICAL SETTING

This section provides a summary of the MEC-related history, physical setting, and land use related to the former Fort Ord and the Group 1 MRAs. An evaluation of these components as related to the development of proposed investigation field activities is included in Section 3.0 of this work plan.

2.1 MEC-Related History

In 1917, the Army bought a portion of the Main Garrison and East Garrison and nearby lands on the eastern 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. Prior to acquisition by the Army, the land was in agricultural use. No permanent improvements were constructed until the late 1930s. In the 1940s, more land was purchased to expand the development of the Main Garrison area and the beach range area was given to the Army. With up to 15,000 active duty military personnel and 5,100 civilians working on site during its active history, the former Fort Ord Garrison areas resembled a mid-sized city, with accompanying family housing, medical facilities, warehouses, office buildings, industrial complexes, and gas stations.

Fort Ord was used to train Army infantry, cavalry, and field artillery units until formal closure. In support of the training of soldiers, military munitions were used at the ranges throughout the former Fort Ord. As a result of the training activities, a wide variety of conventional MEC (related to infantry and artillery training) have been encountered in areas throughout the former Fort Ord. The MEC encountered at the former Fort Ord have been either unexploded ordnance (UXO) or discarded military munitions (DMM).

The Group 1 MRAs includes all or portions of several Munitions Response Sites (MRSs), which have been evaluated for the presence of MEC, and portions of property that lie outside the MRS boundaries, which have had little or no evaluation for the presence of MEC. Within the MRS boundaries, these evaluations have included one or more of the following actions: site reconnaissance and surface and/or subsurface MEC investigation and/or removal actions. The evaluation of those portions of the parcels lying outside of the MRS boundaries included: literature reviews and, in some cases, surface removals completed within the accessible areas. The MEC-related history for the Seaside and Parker Flats MRAs is summarized in the following sections.

2.1.1 Seaside MRA

By 1945, 18 firing ranges and training sites were established within the boundaries of the 8,000-acre multi-range area, which was the area around the perimeter of the former impact area (Figure 1). The Seaside MRA lies on the westernmost part of the former impact area. The Seaside MRA contained the former firing points and some of the former targets associated with the following:

- Small arms ammunition training areas, which included Ranges 18, 19, 20, 21, 22, 23, 46, and 59
- Non-firing target range training area, which included Old Range 22 and Range 23M
- Mortar and antitank training area, which included Range 48
- Booby trap training area, which included Range 50

According to the known configuration of the ranges, weapons were fired to the east and southeast from these firing points toward the center of the impact area. It is expected that munitions activity associated with these ranges would have occurred within the firing points.

Numerous investigations and removal actions were performed by the Army in the Seaside MRA. These actions resulted in complete MEC removal to a depth of 4 feet, with the exception of 35 acres identified by the Army as SCAs and a narrow area west of General Jim Moore Boulevard, which was outside the western boundaries of MRSs established within the MRA. Because the Army's investigation activities did not include the narrow area west of General Jim Moore Boulevard, the status of MEC in this area represents a data gap.

More detailed information on the MEC-related history and nature and extent of contamination within the Seaside MRA has been presented in the SEDR CSM for the Seaside MRA. The CSM from the SEDR is provided in Appendix A of this work plan.

2.1.2 Parker Flats MRA

The historical use of the Parker Flats MRA Phase II areas was for troop training and maneuvers. Because the northern portion of the Parker Flats MRA (north of Gigling Road) prior to 1940 was privately owned agricultural land, it is unlikely that this area was used for military training until after this time. To facilitate previous MEC investigations and removal activities, the historical use areas were divided into MRSs.

The MRSs within the Parker Flats MRA Phase II include MRS-4A, MRS-27A (portion), MRS-27B (portion), MRS-27C, MRS-44EDC/PBC, and MRS-15MOCO.2. The historical uses for these specific MRSs in the Parker Flats MRA Phase II include the following:

- MRS-4A was used as a former Chemical, Biological, and Radiological Training Area.
- MRS-27A (Training Site 1), MRS-27B (Training Site 2), and MRS-27C (Training Site 3) were used as overnight bivouac areas.
- MRS-15MOCO.2 was used as antitank weapons and 40mm grenade ranges and contained the firing lines for Ranges 44 and 45.
- MRS-44EDC and MRS-44PBC were likely used for military weapons and troop training; however, the actual historical use is unknown.

Previous work in the Parker Flats MRA includes numerous site investigations, sampling investigations, and removal actions. More detailed information on the MEC-related history and nature and extent of contamination within the Parker Flats MRA Phase II has been

presented in the SEDR CSM for the Parker Flats MRA Phase II. The CSM from the SEDR is provided in Appendix B of this work plan.

2.2 Physical Setting

The former Fort Ord is located 80 miles south of San Francisco and occupies approximately 28,000 acres adjacent to Monterey Bay and the cities of Marina, Seaside, Sand City, Del Rey Oaks, and Monterey. State Highway 1 crosses the western portion of the former Fort Ord, separating the beachfront from most of the installation. Laguna Seca Recreational Area and Toro Regional Park border the former Fort Ord to the south and southeast, respectively, as do several small communities, such as Toro Park Estates and San Benancio (Figure 1). The physical settings for the Seaside and Parker Flats MRAs are summarized in the following sections.

2.2.1 Seaside MRA

The Seaside MRA is located in the southwestern portion of the former Fort Ord, bordered by the City of Seaside and General Jim Moore Boulevard to the west, the former impact area to the east, Eucalyptus Road to the north, and additional former Fort Ord property to the south (Figures 1 and 3). The Seaside MRA is wholly contained within the jurisdictional boundaries of the City of Seaside.

The Seaside MRA encompasses approximately 419 acres and contains the following four United States Army Corps of Engineers (USACE) property transfer parcels: E23.1, E23.2, E24, and E34 (Figure 3).

The terrain of the Seaside MRA varies from flat to moderately rolling hills. The elevation ranges from approximately 210 to approximately 520 feet mean sea level (msl) with 2 to 15 percent slopes. Vegetation consists primarily of maritime chaparral with patches of non-native grassland and scattered stands of coastal and inland coast live oak woodlands.

The Seaside MRA overlies the Seaside Groundwater Basin, which is structurally complex and divided into several sub-basins. Groundwater is generally encountered at a depth greater than 100 feet below ground surface (bgs). No significant surface-water features or delineated wetlands are reported to be present in the MRA.

More detailed information on the geology, vegetation, surface water, and groundwater of the Seaside MRA has been presented in the SEDR CSM for the Seaside MRA. The CSM from the SEDR is provided in Appendix A of this work plan.

2.2.2 Parker Flats MRA

The Parker Flats MRA is located in the central portion of the former Fort Ord, bordered by the California State University Monterey Bay (CSUMB) Off-Campus MRA (formerly referred to as the CSUMB MRA) and the County North MRA (formerly referred to as the Development North MRA) to the north, the Interim Action Ranges MRA to the south,

CSUMB campus property to the west, and additional former Fort Ord property to the east and southeast (Figures 1 and 4). The Parker Flats MRA is contained within the jurisdictional boundaries of the City of Seaside and the County of Monterey.

The Parker Flats MRA (Phase I and Phase II areas) encompasses approximately 1,180 acres and fully contains USACE property transfer parcels E18.1.1, E18.1.2, E18.1.3, E18.4, E19a.1, E19a.2, E19a.5, E20c.2, E21b.3, L20.18, L23.2, and L32.1, and portions of USACE property transfer parcels E19a.3 and E19a.4 (Figure 4). The area completed under the Phase I activities was approximately 698 acres; the remaining approximately 482 acres were included under the Phase II activities.

The terrain of the Parker Flats MRA is primarily rolling hills with moderate to steep slopes. The elevation ranges from approximately 280 to approximately 490 feet msl with 2 to 15 percent slopes. Vegetation in the Parker Flats MRA consists primarily of coastal live oak woodland with smaller areas of maritime chaparral, grassland, and coastal scrub. Vegetation varies from sparsely vegetated areas to heavy brush.

The Seaside and Salinas Groundwater Basins are the main hydrogeologic units that underlie the MRA. The depth to groundwater is estimated to be greater than 100 feet bgs. There are no aquatic features (i.e., vernal pools, ponds) or delineated wetlands reported to be present on the Parker Flats MRA.

More detailed information on the geology, vegetation, surface water, and groundwater of the Parker Flats MRA Phase II has been presented in the SEDR CSM for the Parker Flats MRA Phase II. The CSM from the SEDR is provided in Appendix B of this work plan.

2.3 Land Use

The former Fort Ord consists of both developed and undeveloped land. This section summarizes the current and future land uses for Group 1.

2.3.1 Current Land Use

The Group 1 MRAs are currently undeveloped open space, with the exception of paved roadways, such as General Jim Moore Boulevard, Eucalyptus Road, and Parker Flats Road, and a major utility corridor for the high-power transmission line that runs along General Jim Moore Boulevard and across the interior portion of the Parker Flats MRA. There are residual structures that supported training activities at the MRAs. Most of these structures have been abandoned and are scheduled for demolition.

Reportedly, the Parker Flats MRA, north of Eucalyptus Road, is accessed by day recreational and equestrian users, including hikers, joggers, mountain bikers, dog walkers, and horse riders. There is also evidence of trespasser activity and illegal dumping in both of the Group 1 MRAs.

More detailed information on the current land uses of the Seaside and Parker Flats MRAs has been documented in the SEDR as CSMs. The CSMs for the Seaside and Parker Flats MRAs from the SEDR are provided as Appendices A and B, respectively, of this work plan.

2.3.2 Future Land Use

The future land uses are primarily based upon the Fort Ord Base Reuse Plan, adopted by FORA on June 13, 1997 (FORA 1997). Other sources of future land use information include public benefit conveyance, negotiated sale requests, transfer documents, the Installation-Wide Multispecies Habitat Management Plan (HMP; USACE 1997), and the Assessment East Garrison – Parker Flats Land Use Modifications, Fort Ord, California (Zander 2002).

Future land use categories and uses approved in the Fort Ord Base Reuse Plan generally include: residential, such as single-family homes; nonresidential, such as equestrian use and supporting facilities, educational and institutional facilities, office and research parks, light-industrial and business parks, and commercial and retail facilities, including roadways and utility corridors; and habitat reserve, such as equestrian facilities and open space. Additional land uses include visitor-related facilities, such as lodging, golf courses, and beach and community parks.

Future land uses for Group 1 include: residential and nonresidential areas in the Seaside MRA; and residential, nonresidential, and habitat reserve areas in the Parker Flats MRA. More detailed information on the future land uses of the Seaside and Parker Flats MRAs has been documented in the SEDR as CSMs for the Seaside MRA and the Parker Flats MRA Phase II. The CSMs from the SEDR are provided as Appendices A and B, respectively, of this work plan.

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3.0 INITIAL EVALUATION

An initial evaluation of the Group 1 MRAs was conducted during development of the SEDR. Development of the CSMs included an evaluation of the known historical military use and associated munitions-related activities, as well as existing information related to previous munitions response actions for each of the MRAs. These evaluations included facility profiles, physical profiles, release profiles, land use profiles, ecological profiles, and pathway analyses, to include identification of source areas, accessibility, receptors, and receptor activities that could result in human health risks related to the potential presence of MEC remaining within the MRAs. The CSMs also provided recommendations and conclusions, which are summarized in Section 4.0 of this work plan.

The following sections provide the initial evaluations presented in the CSMs for the Group 1 MRAs to support the work plan rationale presented in Section 4.0 of this work plan.

3.1 Seaside MRA Evaluation

The documented historical use of the Seaside MRA was a weapons and troop training area (Appendix A). The MEC encountered to date within the MRA are consistent with its documented historical use. As the majority of the MRA has undergone a removal action, the risk has been reduced, with the exception of approximately 35 acres of subsurface area designated by the Army as SCAs and the hillside west of General Jim Moore Boulevard. The initial evaluation of previous munitions response actions within the Seaside MRA indicated that data gaps needed to be filled to more fully characterize the MRA. These data gaps consist of the SCAs and the hillside west of General Jim Moore Boulevard. The results of the Phase II Seaside MRA Removal Action will be incorporated into the Group 1 RI/FS report.

3.2 Parker Flats MRA Phase II Evaluation

The documented historical use of the Parker Flats MRA Phase II was as a troop training area (Appendix B). The MEC encountered to date within the investigated areas of the MRA are consistent with its documented historical use; however, based on the limited investigations conducted to date, the Phase II portion of the Parker Flats MRA has been identified as a data gap. Therefore, MEC investigation is necessary to confirm the current understanding of military activities within the Phase II portion of the MRA. Although this area has not been investigated, it is anticipated that MEC similar to the types and quantities encountered in the vicinity will be found during future investigations.

Removal actions have been completed in MRS-15 MOCO.2, MRS-44 PBC, and MRS-04A; therefore, the collection of additional data is not anticipated to be required in these areas.

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4.0 WORK PLAN RATIONALE

This Group 1 RI/FS Work Plan outlines the steps to be taken: 1) to fill data gaps in the Parker Flats MRA Phase II; 2) to define the nature and extent of MEC contamination; 3) to assess explosives safety risk that may be present; and 4) to develop, screen, and evaluate alternatives to reduce the potential explosives safety risk to current and future property owners and the general public. The results of the above steps will be documented in the RI/FS report for use by the Army in developing the Proposed Plan and making a decision on remedial action.

This section outlines the components of the Group 1 RI/FS Work Plan that will be used to complete the RI/FS process, develop the RI/FS report, and support an Army remedial action decision. This section also provides a summary of the data needs and information gathering tools that will be used during the RI/FS. The major decision points to be addressed during development of the RI/FS process are as follows:

- Is the site characterization data of known and sufficient quality to adequately characterize the nature and extent of MEC contamination?
- Is the site characterization data of known and sufficient quality to support completion of an explosives safety risk assessment?
- What are the remedial action alternatives, and which alternative(s) meet the nine CERCLA criteria, making it appropriate to mitigate explosives safety risks?

Based on the initial evaluation provided in the SEDR, as summarized in Section 3.0 of this work plan, the following sections describe the RI/FS approaches and data needs for Group 1.

4.1 Summary of the Approach for Group 1

4.1.1 Seaside MRA

The ESCA RP Team is currently completing the Army's NTCRA within the Seaside MRA under the Phase II Seaside MRA Removal Action, as presented in the Final SSWP Addendum (ESCA RP Team 2008a), in order to mitigate the risk related to the potential existence of MEC and fill identified data gaps. The Phase II Seaside MRA Removal Action will collect sufficient data to fill remaining data gaps to complete the RI/FS report and support the Army's remedial action decision. Therefore, no additional investigative field activities are proposed for the Seaside MRA.

However, an RQA Pilot Study will be conducted in the Seaside MRA to assess the potential residual risk, if any, posed by undetected MEC, following MEC removal actions, in a portion of the areas planned for future residential development. The RQA Pilot Study work plan is presented in Volume 2 of this Group 1 RI/FS Work Plan.

4.1.2 Parker Flats MRA Phase II

The nature and extent of MEC contamination within the Parker Flats MRA Phase II areas have not been fully characterized. Data from limited investigations in these areas along with results from previous munitions response actions conducted by the Army adjacent to the Phase II areas provide an overall indication of the nature and extent of the MEC contamination. The data gaps, as identified in the SEDR, will be filled during the RI. The following actions will be conducted during the RI to fill these data gaps and support the refinement of the CSM and analysis of risk for inclusion in the RI/FS report:

- Collect data, sufficient to support the MEC RI, in all areas of the Parker Flats MRA Phase II where limited data are available.
- Conduct an RQA Pilot Study in areas where MEC investigation and removal actions have already been completed, to assess the potential residual risk, if any, posed by undetected MEC in areas planned for future residential development.

The RQA Pilot Study work plan is presented in Volume 2 of this Group 1 RI/FS Work Plan. The field investigation is detailed in the G1 SAP presented as Volume 2 of this Group 1 RI/FS Work Plan.

4.2 Data Quality Objectives

The RI/FS process requires the collection of data for regulatory compliance and decision-making purposes. The data collected must have sufficient quality and quantity to support decision making.

The DQO process developed by EPA was employed as a systematic planning tool to establish criteria for data quality and for guiding data collection. The results of that planning process are included in the following sections of this work plan, and in the G1 SAP and Quality Assurance Project Plan (QAPP) presented in Volume 2 of this Group 1 Work Plan.

4.3 Validation of Existing Data

The SEDR identifies and summarizes existing data for the Group 1 MRAs, including the results of previous investigations and removal actions. The validation of existing data is necessary to establish that the data are of known and sufficient quality to be usable in the RI/FS to support completion of an explosives safety risk assessment and the evaluation of remedial alternatives.

Existing data generally fall into the following three categories:

- Physical Setting and Land Use
- Historical Records and Military History
- MEC Response Actions

The physical setting and land use category data are well understood. Validation efforts will consist of verifying that the information is up to date, accurate, and complete. Historical records, military history, and MEC investigations and removal actions data will be reviewed and validated as described below.

4.3.1 Historical Records and Military History

The Army researched historical records and documented the military history of Fort Ord in a series of Archive Search Reports. The Army historical records and military history for the Group 1 MRAs will be reviewed to determine if the munitions found during previous munitions response actions are consistent with the initial evaluation of each MRA. The following information will be reviewed, as appropriate:

- Historical Records
 - Archive Search Reports
 - Non-military history of the former Fort Ord
 - Specific military training / use of each MRA
- Military History / Field Manuals
 - Training practices by era
 - Munitions types and use in various operations, during various time periods

4.3.2 MEC Investigations and Removal Actions

The previous munitions response actions that have been performed will be evaluated in order to assess the quality of the response actions and resulting data, using the criteria presented in the following subsections.

4.3.2.1 *Equipment Evaluation*

An evaluation of the equipment used during previous munitions response actions will focus on how the equipment was employed and maintained. The evaluation will involve checking and reviewing the following items:

- Manufacturer calibration and operating procedures
- Calibration documentation, including frequency and null points
- Calibration records or logs
- Operator training records
- Quality assurance/quality control (QA/QC) of equipment calibration and usage
- Historical evaluations of equipment detection capabilities (i.e., geophysical prove-outs, seeding operations, etc.)

4.3.2.2 Adequacy of Removal Approach

Items that will be evaluated to assess the adequacy of previous removal approaches will include depth of sampling/removal and future land use. In addition, the depth at which items were found will be compared with maximum calculated penetration depths and calculated detection depth limits. Documentation that will be used to evaluate the previous operations includes:

- munitions response reports and associated maps
- reconnaissance and sampling data
- site work plans
- FORA ESCA RP database and/or Military Munitions Response Program (MMRP) database
- field logs and field maps

Additional items not listed above may be reviewed, if they are relevant to the evaluation of past removal actions.

4.3.2.3 Collection and Management of Field Data

The Army has evaluated the collection and management of field data for previous munitions response actions. The evaluation conducted by the Army will be used to support the validation of data collected by the Army and its contractors, which included the following activities:

- Data QA (If there was no evidence that data QA was conducted, a 10 percent QA effort was performed.)
- The Army performed a 100 percent QC review of the data in the MMRP database previously generated from work conducted by prior munitions response contractors. The review followed an approved Standard Operating Procedure (SOP). This evaluation included a review of the field grid records and the MMRP database. It also included a review of Human Factors Application, Inc. (HFA) data provided in the after-action report (HFA 1994). The USACE implemented a QA review of 10 percent of the data reviewed by Parsons. The QA review included a comparison of the data set with the data set reported in the contractor after-action reports. The requirements of the USACE QA review are described in the SOP. The purpose of the QC data review was to complete a 100 percent check of all available grid records to identify discrepancies between the after-action reports and the grid records, if any. Discrepancies were then researched and appropriate corrections were made in the MMRP database.
- Parsons used a digital process for field data collection, which reduced the data issues associated with the use of grid sheets (such as human errors, inconsistent munitions nomenclature, etc.). Parsons' data were managed in accordance with the quality procedures outlined in its Programmatic Work Plan (PWP; Parsons 2004) and had to

meet the standards of the MMRP database, managed by USACE, prior to loading the data into the database.

4.3.2.4 Completeness of Existing Records and Data Gaps

The completeness of existing records and the identified data gaps will be evaluated. The records will be reviewed to determine if there is enough defensible data to 1) assess whether or not the work was completed according to contractual requirements, 2) make recommendations on the adequacy of the removal actions, and 3) identify data gaps, if any, that may need to be filled to fully evaluate the adequacy of the response action.

4.3.2.5 Accuracy of Site Boundaries

Site boundaries are of particular importance to the completion of the RI/FS. Site boundaries were first presented as part of the 1993 Archives Search Report (USACE 1993). These boundaries served as a foundation for the initial investigation under the MMRP. Since that time, site boundaries have been modified, based on results of MEC investigations and to support property transfer. The evaluation of previous work will include an evaluation of existing information to determine whether the establishment of site boundaries is accurate, based on historical information and removal data, and whether the surveying method used to delineate the site boundaries was accurate.

4.4 RQA Pilot Study

The Group 1 RI/FS Work Plan includes an RQA Pilot Study work plan, which is presented in Volume 2 of this work plan. It is recognized that an MEC removal action may not successfully acquire and recover all MEC at the site. The regulatory agencies have expressed concern regarding the residual risk that remains after MEC removals have taken place, particularly in areas that are slated for residential development (i.e., unrestricted land use). In an effort to satisfy regulatory concerns, the RQA process, was developed to allow the regulators to gain comfort with the acceptability of a parcel, where MEC removal was conducted, for residential use (and other sensitive uses). As specified in the ESCA, FORA and their response contractor were tasked to develop an RQA Pilot Study, which includes recommending areas for inclusion in the study and developing success criteria to be used by EPA and DTSC to determine if and when the RQA process will be applied to other designated residential parcels covered by the ESCA. The effort is also intended to satisfy the requirements of the ESCA for a RQA pilot study. The relevance and usefulness of the RQA process will be tested in the RQA Pilot Study. The results of the Pilot Study will be considered in developing and evaluating remedial alternatives in the FS.

4.5 Fill Data Gaps / Collect Additional Data

Based on the initial evaluation, it was determined that additional data should be collected to fully characterize the MRAs, and to support an explosives safety risk assessment and remedy selection for Group 1. The proposed scope is to conduct an intrusive investigate on 100

percent of the data gap areas during the RI. This approach will minimize the uncertainty during the FS and is expected to result in an NFA ROD with institutional controls.

To achieve this goal, a high level of data collection effort is incorporated into the RI fieldwork approach, while considering the future reuses of the MRA. The DQOs related to the MEC investigation planned in the Parker Flats MRA Phase II are included in Volume 2 of this Group 1 RI/FS Work Plan. The DQOs for the Seaside MRA are documented in the Final SSWP Addendum for the Phase II Seaside MRA Removal Action (ESCA RP Team 2008a).

4.5.1 Seaside MRA

The Army's 100 percent digital geophysical survey for MRS-15SEA.1-4 is being expanded by geophysically mapping and investigating anomalies in the SCAs and the hillside west of General Jim Moore Boulevard. This investigation is being conducted to fill a data gap to support completion of the RI. A detailed field investigation plan for this area was presented in the Final SSWP Addendum (ESCA RP Team 2008a).

4.5.2 Parker Flats MRA Phase II

Data gaps identified in Section 4.1.2 will be addressed during the RI as outlined below based on future land use category. A detailed field investigation plan is presented in Volume 2 of this Group 1 RI/FS Work Plan.

Residential and Non-Residential Development Parcels

The investigation of future residential or nonresidential development areas will be conducted by performing 100 percent digital geophysical mapping (DGM), using the best available and appropriate detection technology (BADT). Areas that are not suitable for DGM will be investigated using analog BADT. The objective of the geophysical investigation is to accurately locate, investigate, and remove all geophysical anomalies that potentially represent MEC in the subsurface. Vegetation will be cut to the extent possible while preserving the trees; however, the limbs of the trees will be trimmed to maximize the DGM surveys.

Habitat Reserve Areas

The habitat reserve areas will be investigated in two parts: 1) conducting a DGM or BADT investigation along trails; and 2) conducting instrument-aided surface and near-surface (within 3 inches) surveys of the remainder of the habitat reserve area. The highest use areas, specifically trails and open areas adjacent to the trails (extending a maximum of 5 feet off the trail), will be investigated by performing 100 percent DGM, or investigations using the BADT, to the depth of detection similar to the residential and non-residential development areas. The rationale for conducting this investigation is that trails are the highest use areas, and erosion along the trails could increase the potential for encountering MEC.

The purpose of the surface sweep in the habitat reserve areas will be to identify and remove anomalies that are on or near the surface (within 3 inches). Surface and near-surface finds (MEC and MD) will be fully documented and reviewed by the ESCA RP Team in consultation with the regulatory agencies during the investigation. If the ESCA RP Team in consultation with the regulatory agencies determine that significant near-surface MEC (either high concentration or high-risk UXO) has been discovered during the investigation, a field variance will be developed to change the investigation approach to include a focused intrusive investigation to ascertain the limits of the condition.

4.6 Data Analysis

It is necessary to analyze both existing and newly collected data to continuously update the CSMs and fully characterize the Group 1. The following questions will be answered during this ongoing data analysis:

- Is there a clear understanding of current/future land use and current physical characteristics of the area?
- Does historical information indicate that military munitions may have been used within the MRA?
- Are MEC and MEC-related materials being found consistent with the documented historical usage of the area?
- Was the MEC removal completed in the appropriate area of the site?
- Do MEC found at the site indicate undocumented historical munitions use of the site?
- Should the MRA be subdivided into separate units or areas?
- Were the geophysical instruments used during the investigations and removal actions able to detect the suspected MEC items at the expected depths of penetration?
- Can the removal data be used to support an evaluation of alternatives for the FS?
- Can the removal data be used to support explosives safety risk management decision making?

If the results of the above analysis present a strong weight of evidence to support that the existing data is usable for defining the nature and extent of contamination, completion of an explosives safety risk assessment and FS, as determined by the project team (consisting of the EPA, DTSC, FORA, and the Army), the MRA will proceed to the risk assessment phase.

4.7 Explosives Safety Risk Assessment

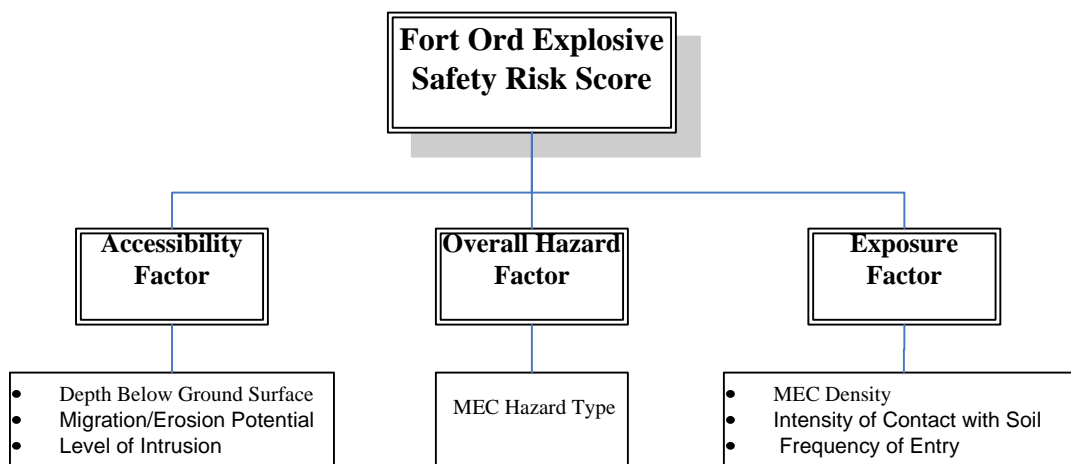
The Fort Ord Ordnance and Explosives Risk Assessment Protocol ("the Protocol") will be used to assess the hazards posed by MEC for receptors based on future land use (Malcolm Pirnie 2002). Unlike typical risk assessments that evaluate potential exposures to hazardous substances in environmental media, the Protocol does not calculate a numerical probability of adverse effects or a hazard index. Rather, it relies on an assumption that any encounter with

MEC will result in an adverse effect, and provides a qualitative description of the explosives safety risk, based on the likelihood of encountering an MEC item combined with the potential of the item to cause a serious injury if it functions.

The Protocol will be used to assess the baseline risk for Group 1 based on SEDR and RI data and future land use as identified in the Final Fort Ord Reuse Plan in order to provide an estimate of the risks posed by current site conditions and assess whether a past (or planned) removal or remedial action was (or will be) effective in reducing those risks.

The Protocol is used to develop and perform a comparative evaluation of various remedial alternatives during the FS. Two matrices combine six of the input factors into overall scores for Accessibility and Exposure. A third matrix combines the scores for Accessibility and Exposure with the seventh input factor, Overall Hazard, to produce a qualitative score for estimating explosives safety risk.

The seven inputs to the explosive safety score are outlined below.



Data needs for the explosives safety risk assessment will be documented in the RI and will include:

- Physical site characteristics
- MEC types, distribution, and previously identified hazard categories
- MEC penetration depths
- Land use (Current/Future)
- Receptors (types/subpopulations, sensitivities, numbers/density, locations, activity levels/patterns)

4.8 Identification of ARARs

Overall, three types of ARARs are defined by the EPA (EPA 1988a) and will be considered in the Group 1 RI/FS:

- Chemical-specific or ambient ARARs - Health- or risk-based numerical values for specific hazardous substances or contaminants
- Action-specific ARARs - Technology-based requirements triggered by the type of remedial action under consideration. This category also includes performance- and design-specific requirements, such as restrictions on the appearance of or noise from a remedial system
- Location-specific ARARs - Impose restrictions on certain types of activities or contaminant concentrations in certain environmentally sensitive areas such as wetlands, flood plains, and historic sites

4.8.1 Initial Identification of Potential ARARs

The Army has conducted a detailed evaluation and identification of potential ARARs and to-be-considered criteria (TBCs) requirements potentially applicable to munitions response actions at the former Fort Ord. The list of potential ARARs was based on existing/previous Army decisions regarding munitions response actions (MACTEC 2007). These previously identified ARARs were reviewed and selected for consideration during the Group 1 RI/FS process. This initial list of potential ARARs is included in Table 1.

4.8.2 Solicitation of ARARs

On behalf of the Army and FORA, the ESCA RP Team will solicit and communicate with the DTSC regarding the identification of State of California ARARs and TBCs for the Group 1 RI/FS. In accordance with 40 CFR 300.400(g), the state will identify those chemical-, location-, and action-specific ARARs or TBCs that are: applicable to the release or remedial action being contemplated; otherwise relevant and appropriate; or advisories, criteria, and guidance useful in developing the remedy.

In addition, ESCA RP Team is responsible for identifying all federal ARARs, and will obtain a review of the ARARs from the EPA and the Army.

The identification of ARARs or TBCs can be an iterative process; therefore, ARARs may be updated throughout the Group 1 RI/FS process, as necessary, and will become final only when the ROD is signed. At a minimum, the initial list of potential ARARs in Table 1 will be reviewed after the initial screening of alternatives has been completed, but before initiation of the detailed analysis of alternatives that will be conducted as part of the FS.

4.9 Identifying Appropriate Remedial Actions to Mitigate Risks

Based on the EPA’s “Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA” (EPA 1988b), the preliminary remedial action objectives (RAOs) for Group 1 will be to achieve the EPA’s threshold criteria of “Overall Protection of Human Health and the Environment” and “Compliance with ARARs.”

Using the results of the RI, explosives safety risk assessment, and potential ARARs, risk management alternatives will be developed and evaluated to support the intended land use.

The AOC indicates that the evaluation of alternatives should consider, at a minimum, the following:

- A no-action alternative
- An alternative that reduces or eliminates the hazard, toxicity, mobility, or volume of contaminants (including treatment)
- An alternative that considers land use controls
- An alternative that considers unrestricted use
- Consideration of innovative technologies

Based on RI/FSs previously developed by the Army for portions of the former Fort Ord, remedial alternatives would likely include one or more of the following:

- No further action
- Land use controls (e.g., administrative and engineering controls)
- Surface clearance
- MEC removal to depth, as required by future land use or other applicable standards
- Construction support
- MEC recognition training
- Combinations of the above

These potentially applicable response actions will be evaluated, screened, and developed into remedial alternatives that will be fully evaluated using the following criteria:

1. Overall protection of human health and the environment
2. Compliance with ARARs
3. Long-term effectiveness and permanence
4. Reduction in toxicity, mobility, or volume through treatment
5. Short-term effectiveness
6. Implementability

7. Cost
8. State (or support agency) acceptance
9. Community acceptance

4.10 Community Relations

Community relations activities for Group 1 are intended to keep communities informed of MEC-related activities at the former Fort Ord, and help supporting agencies respond to community concerns. Community relations activities for the ESCA RP are described in the Community Involvement and Outreach Program (CIOP) Plan (ESCA RP Team 2008b). The CIOP Plan also serves as an addendum to the Army's Community Relations Plan (CRP) Update No. 3 (Army 2006).

The CIOP Plan outlines communication techniques that will be used to keep the affected communities informed throughout the RI process at Group 1. Public participation activities, including fact sheets, public notices, and press releases, will be conducted in accordance with CERCLA.

The following sections summarize the approach outlined for community relations activities in the CIOP Plan that will be used during the RI process.

4.10.1 Community Involvement

The CIOP Plan summarizes the community profile surrounding the former Fort Ord as described in the CRP. The community is considered to consist of:

- residents both on the former Fort Ord and in nearby communities
- present business owners, employees, and students on the former Fort Ord property
- elected local representatives and public agencies
- environmental and special interest groups
- students, faculty, and staff at the CSUMB campus

Continuing community involvement will be achieved through a combination of communication, participation, and outreach to all affected stakeholders. To achieve this, FORA will use newsletters, community involvement workshops, fact sheets, project announcements, public notices, and website updates to provide information about the RI process. In addition, a dedicated phone line has been established for the FORA ESCA RP. Callers will be able to get project updates and leave messages regarding questions or comments.

4.10.2 Community Relations Strategy

Implementation of community relations for the RI will focus on providing information regarding the timeline, reporting, and scheduling of RI activities. As outlined in the CIOP Plan, several objectives for the CIOP apply to the RI. FORA will do the following:

- Provide timely and accurate FORA ESCA RP information
- Provide opportunities for the public to comment and provide input on technical documents
- Provide transparency in decision making and respect for all viewpoints
- Meet all regulatory requirements
- Address community concerns in a collaborative fashion

4.10.3 Implementation of Community Relations Activities

Specific community relations activities related to conducting the Group 1 RI include:

- Publish articles in the quarterly newsletter. Newsletters will be mailed to all interested parties in adjacent communities. Additional interested parties on the FORA ESCA RP mailing list will also receive the newsletters. The newsletters will also be posted on the FORA ESCA RP website (<http://www.fora.org>) and a link to newsletters will be provided on the Army's Fort Ord Cleanup website (www.fortordcleanup.com/community/factsheets.asp). FORA will work with representatives of CSUMB to ensure they are kept apprised of all ESCA-related cleanup activities and have access to relevant information about the ESCA RP. Information about the FORA ESCA RP website will be made available to representatives of CSUMB allowing them to notify their students, staff, and faculty as appropriate. Special emphasis will be placed on coordinating with the university concerning when field construction work will impact access routes, CSUMB cross country trails and other campus sponsored activities. FORA will also participate in CSUMB outreach activities, as appropriate.
- Hold public meetings as necessary to satisfy regulatory requirements.
- Provide briefings and/or updates at the quarterly Community Involvement Workshops. The Workshops are scheduled for the second Wednesday in January, April, July, and October.
- Provide updates at the Technical Review Committee (TRC) quarterly meetings. The TRC is composed of representatives of local agencies, city governments, and institutions as well as federal and state agencies with an interest in the cleanup.
- Publish a fact sheet distributed by direct mail to local residents, community leaders, minority community organizations, and those who have requested to be on the CIOP mailing list. Fact sheets will also be posted on the FORA ESCA RP website, on the Fort Ord Cleanup website, and at community involvement activities.

- Publish public notices in local newspapers, and provide press releases to the media announcing the availability of RI-related documents and opportunities for public comment.
- Respond to comments and inquiries from the community on the RI process or related documents.
- Provide copies of RI-related documents to the Army for inclusion in the Army-maintained Information Repositories and Administrative Record.

4.10.4 Roles of State and Local Authorities

State and local government cooperation has included regulatory agency involvement throughout the ESCA RP. FORA and its contractors continue to meet regularly with the regulatory agencies with respect to the ongoing munitions response activities.

4.10.5 Public Education

The Army conducts a public education program. The program includes general information related to the hazards associated with MEC and site-specific information on the history and current status of the property related to MEC. In addition, the USACE developed a school safety program.

4.11 Data Management

Data generated during implementation of the Group 1 RI/FS Work Plan will be managed according to established data management and quality procedures, as presented in Volume 2 of this work plan. New data will be included in the data validation, in terms of a completeness evaluation, identification of data gaps, and site boundary evaluation, as appropriate.

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5.0 GROUP 1 RI / FS TASKS

This section outlines standard RI/FS tasks that will be performed to make decisions regarding risk and remedial actions during the Group 1 RI/FS, as defined by the AOC. The AOC tasks presented below are consistent with those provided in the EPA's current RI/FS guidance document (EPA 1988b).

5.1 Task 1 Project Panning

Task 1 includes efforts related to initiating the project and scoping project activities. The majority of project planning will occur during the scoping phase of the Group 1 RI/FS and include both site planning and project planning. However, because of the iterative nature of the Group 1 RI/FS, the planning process will continue throughout the project. The initial project planning process is documented in the SEDR and this work plan.

5.2 Task 2 Community Relations

Task 2 includes the efforts related to the preparation and implementation of the CIOP Plan (ESCA RP Team 2008b). Community relations activities serve to keep stakeholders informed of activities at the Former Fort Ord and help the supporting agencies respond to community concerns. The MEC-related community relations programs implemented at the former Fort Ord have been described in the CRP (Army 1998), the CRP Update Number 1 (Army 2000), the CRP Update Number 2 (Army 2001) and the CRP Update Number 3 (Army 2006). The CIOP Plan is an addendum to the Army's former Fort Ord CRP.

5.3 Task 3 Field Investigation

Task 3 incorporates efforts related to fieldwork undertaken to fill identified data gaps, in order to complete the remedial investigation at Group 1 in accordance with Task 4.1 of the AOC. Section 4.5 of this work plan presents the investigation approach for the fieldwork to be performed during the RI. The SAP will present the scope of specific activities for the fieldwork, and the QAPP will detail the procedures to be followed when carrying out the field activities. The SAP and the QAPP are presented in Volume 2 of this Group 1 RI/FS Work Plan.

5.4 Anticipated Penetration Depths

The majority of the MEC recovered from the Parker Flats MRA Phase II was identified as surface-related munitions (signal flares, grenades, and simulators) used for troop maneuvers, and all of the MEC were recovered from depths of less than 2 feet, except for the MEC items recovered from burial pits.

5.5 Task 5 Data Evaluation

Task 5 includes refining and updating the CSMs for Group 1 to document additional site characterization results, including physical characteristics, MEC source characteristics, and the nature and extent of contamination in accordance with Task 4.1 of the AOC. The results of this task will be presented to state and federal regulators and the Army during regularly scheduled monthly meetings prior to proceeding to the risk assessment. Community stakeholders will be apprised of any changes to the CSM and their potential impacts by way of the most appropriate and timely method (e.g., Community Involvement Workshop meeting, ESCA Community meeting, ESCA newsletter, and/or ESCA Fact Sheet).

5.6 Task 6 Risk Assessment

Task 6 includes efforts related to assessing risks to human health and the environment in accordance with Task 4.2 of the AOC. In general, the objectives of a baseline risk assessment or risk evaluation will be attained by identifying and characterizing the following:

- Potential human and environmental receptors
- Potential exposure routes and extent of actual or expected exposure
- Extent and likelihood of expected impact or threat
- Level of uncertainty associated with the above items

The main purpose of the risk evaluation portion of the Group 1 RI/FS is to provide an estimate of the risks posed by site conditions (i.e., MEC) and to assess whether a past (or planned) removal or remedial action at a site was (or will be) effective in reducing those risks. The results of this task will be presented to community stakeholders at a community meeting on the Draft RI/FS report.

5.7 Task 7 Treatability Studies

Task 7 includes efforts to plan and conduct pilot, bench, or other treatability studies. Treatability studies are conducted primarily to achieve the following:

- Provide sufficient data to allow treatment alternatives to be fully developed and evaluated during the detailed analysis and to support the remedial design of a selected alternative
- Reduce cost and performance uncertainties for treatment alternatives to acceptable levels so that a remedy can be selected

Sufficient information is available to allow screening and evaluation of potentially applicable remedial actions (Section 4.7); therefore, treatability studies are not required.

5.8 Task 8 Remedial Investigation Reports

Task 8 consists of efforts related to the preparation of the RI findings, once the data have been evaluated. The task includes all draft and final RI reports, as well as task management and QC. The results of the baseline risk assessment will be presented to stakeholders prior to proceeding to the development of screening alternatives.

5.9 Tasks 9, 10, and 11 Feasibility Study

Tasks 9, 10, and 11 described below will comprise the FS activities. The FS will be completed using information from the evaluation of munitions response activities. The FS will be conducted in accordance with the EPA's RI/FS guidance document (EPA 1988b) and will use site-specific data to screen, evaluate, and recommend remedial alternatives and long-term risk management measures.

5.9.1 Task 9 Remedial Alternatives Screening

Remedial alternatives screening will be based on the identification of preliminary remediation goals (PRGs) and RAOs in accordance with Task 4.3 of the AOC.

PRGs and RAOs include potential statutory and regulatory requirements, such as ARARs, guidance and advisories (TBCs), and risk-based concentrations of chemicals in environmental media that have been brought forward from the risk assessment. Candidate PRGs will be developed during the RI and presented in the FS and ROD. In addition, the National Contingency Plan specifies that RAOs be developed that address: (1) contaminants of concern, (2) media of concern, (3) potential exposure pathways, and (4) remediation goals (40 CFR 300.430(e)(2)(i)).

Numerical cleanup standards are not available for munitions response actions. Therefore, the PRGs for MEC on the surface and in subsurface soil are developed to address MEC using the most appropriate technologies, to ensure protection of the public consistent with the proposed end use of the property. Chemical-specific (i.e., specific to MEC) ARARs, if any, and the Fort Ord Base Reuse Plan will be considered as PRGs.

The Group 1 RI/FS will contain a discussion of the substantive requirements that will be considered as potential ARARs and TBCs identified for munitions response, gathered from state and federal sources. The Superfund Amendments and Reauthorization Act of 1986 requires that cleanup alternatives consider and attain ARARs, which are promulgated under federal or state law. ARARs are designed to be protective of human health and the environment and to be technically achievable with existing remedial techniques.

Based on the EPA's "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" (EPA 1988b), the preliminary RAOs for Group 1 will be to achieve the EPA's threshold criteria of "Overall Protection of Human Health and the Environment" and "Compliance with ARARs."

These are considered as PRGs. The final acceptable exposure levels will be determined as part of the FS, on the basis of the results of the risk assessment and the evaluation of the expected exposures and associated risks for each alternative, as discussed in Section 5.9.2.2 of this work plan.

5.9.2 Task 10 Remedial Alternatives Evaluation

The evaluation of remedial alternatives will include the development of alternatives, refinement and documentation of RAOs, identification of potential ARARs, development of general response actions, and a detailed analysis of each alternative as described in the following sections of this work plan.

5.9.2.1 *Development of Alternatives*

During the FS, remedial technologies and their associated implementation, containment, treatment, or disposal requirements will be identified, pre-screened, and then combined into alternatives in accordance with Task 5.1 of the AOC. Information obtained during the RI is considered in developing the list of alternatives for evaluation during the FS. Some technologies, implementation, or property use restrictions may become apparent during this step, or may become necessary regardless of which remedy is selected. Evaluation of alternatives should consider, at a minimum, the following:

- A no-action alternative
- An alternative that reduces or eliminates the hazard, toxicity, mobility, or volume of contaminants (including treatment)
- An alternative that considers land use controls
- An alternative that considers unrestricted use
- Consideration of innovative technologies

For any evaluation of response alternatives where a land use control will be imposed, either as a stand-alone response alternative or as one component of a more complex alternative, the evaluation of response alternatives will include the following:

- An analysis of alternative(s) utilizing a land use control
- An analysis at the level of detail appropriate to the size and scope of a response, of alternatives not requiring a land use control (e.g., implementation of a response that allows unrestricted use)

This will allow consideration of restricted and unrestricted use alternatives in selecting the response action.

For any alternative proposed that includes the use of a land use control, sufficient detail and analysis of the likely control mechanisms that would be used to achieve the objectives will be included in the FS to enable a determination of the long-term effectiveness and reliability of

such control mechanisms. Additionally, cost estimates for the establishment, implementation, monitoring, and reporting of the land use controls will be included in the cost estimates for each alternative that includes such controls.

5.9.2.2 Refine and Document RAOs

Based on the explosives safety risk assessment and the results of the RI, site-specific RAOs will be reviewed and modified, if necessary, in accordance with Task 5.2 of the AOC. The modified RAOs will be documented in a technical memorandum, prior to the completion of the FS, which will be reviewed and approved by the EPA, after consultation with the DTSC. These modified RAOs will specify the contaminants and media of interest, exposure pathways and receptors, hazards, and an acceptable contaminant level or range of levels (at particular locations for each exposure route).

5.9.2.3 Identification of Potential ARARs

ARARs, in conjunction with risk-based levels developed in the risk assessment, will be employed in directing response actions and establishing cleanup goals in accordance with Task 5.3 of the AOC. ARARs are used as a "starting point" in determining the protectiveness of a site remedy. Additional guidance on ARARs is found in EPA/540/G-89/006 (EPA 1988a). An initial list of potential ARARs is provided in Table 1 and is based on Army decisions regarding munitions response actions for the former Fort Ord (Section 4.8).

5.9.2.4 Develop General Response Actions

General response actions will be developed for each parcel defining implementation, containment, removal, or other actions, singly or in combination, as appropriate to satisfy the RAOs in accordance with Task 5.4 of the AOC.

5.9.2.5 Detailed Analysis of Alternatives

A detailed analysis of potential alternatives will be developed, which will consist of an evaluation of each option against the nine CERCLA evaluation criteria and a comparative analysis of all options using the same evaluation criteria in accordance with Task 5.5 of the AOC. The nine CERCLA evaluation criteria will be applied to the assembled remedial alternatives to ensure that the preferred remedial alternative(s) will be protective of human health and the environment; will be in compliance with, or include a waiver of, ARARs; will be cost-effective; will utilize permanent solutions and alternative treatment technologies, or resource recovery technologies, to the maximum extent practicable; and will address the statutory preference for treatment as a principal element. The evaluation criteria will include:

1. Overall protection of human health and the environment
2. Compliance with ARARs
3. Long-term effectiveness and permanence

4. Reduction in toxicity, mobility, or volume through treatment
5. Short-term effectiveness
6. Implementability
7. Cost
8. State (or support agency) acceptance
9. Community acceptance

(Note: Criteria 8 and 9 are considered after the Group 1 RI/FS report has been released to the general public and after the Proposed Plan public comment period.)

The results of the detailed analysis of remedial alternatives will become a major factor in selecting a preferred alternative, after completion of the Group 1 RI/FS. The detailed analysis will include:

- A description of each alternative that outlines the strategy involved and identifies the key ARARs associated with each alternative
- A discussion of the assessment of each alternative against each of the nine CERCLA criteria

A preliminary assessment of Criteria 8 and 9 may be provided at this time, as appropriate, or these will be addressed following the public comment period

5.9.3 Task 11 Feasibility Study Reports

The collection and evaluation of new data, as well as the results of the evaluation of previous work, in conjunction with the risk evaluation and FS described above, will serve as the RI/FS for Group 1. Pertinent information that will be documented in the RI/FS report is as follows:

- Summary of the work performed as part of the evaluation of previous munitions response activities
- Data collected during the RI
- Results of the evaluation of previous work and planned RI work
- Conclusions regarding the usability of the data
- Evaluation of explosives safety risks
- FS
- Recommended alternatives
- Long-term explosives safety risk management measures

6.0 REPORTING AND SCHEDULE

This section provides the general outline of the RI/FS report and anticipated schedule for implementation and completion of the Group 1 RI/FS Work Plan.

6.1 Reporting

The Group 1 RI/FS report will generally be organized as follows:

Volume 1 – Remedial Investigation

This volume provides the results of the Group 1 RI and will likely include the following components:

- **Section 1 – Introduction.** This section will provide the purpose of the report and background information on the Army's MMRP and the FORA ESCA RP.
- **Section 2 – Background.** This section will present the Fort Ord military munitions-related history, physical setting, and background information on the base-wide Munitions Response RI/FS.
- **Section 3 – Group 1 Remedial Investigation.** This section will provide the RI for Group 1 (Seaside MRA and Phase II of the Parker Flats MRA), to include background, updates to the CSMs, and the results and evaluation of munitions response activities.
- **Section 4 – References.** This section will provide a list of references for pertinent documents cited in the report.

Volume 2 – Explosives Safety Risk Assessment

This volume provides the results of the Group 1 explosives safety risk assessment, which describes the qualitative and quantitative factors potentially resulting in a receptor encountering an MEC item. The risk assessment is then used to develop and evaluate remedial alternatives during the FS. The Group 1 risk assessment will likely include the following components:

- **Section 1 – Introduction.** This section will provide the purpose and objectives of the risk assessment.
- **Section 2 – Data and Data Usability.** This section will provide an evaluation of the data and data usability to support a risk assessment.
- **Section 3 – Receptors and Reuse Areas.** This section will identify the selected receptors for the various reuse areas of the Group 1 MRAs.
- **Section 4 – Risk Assessment Results.** This section will describe the assumptions and results of risk analysis for each of the reuse areas in the Group 1 MRAs.

- **Section 5 – Uncertainty.** This section will describe the uncertainties related to the data, input components, and future land use and associated receptors.
- **Section 6 – Conclusions.** This section will present a summary of the risk assessment results and the conclusions.
- **Section 7 – References.** This section will provide a list of references for pertinent documents cited in the report.

Volume 3 – Feasibility Study

This volume provides the results of the Group 1 FS that identifies and selects preferred remedial alternatives to address potential after-action MEC risks. It presents the RAOs, identification of alternatives, screening of alternatives, and selection of alternatives. The FS also describes the proposed plan and ROD process. The Group 1 FS will likely include the following components:

- **Section 1 – Introduction.** This section will describe the purpose and objectives of the FS and present background information on the Group 1 RI/FS process.
- **Section 2 – Remedial Approach.** This section will define the reuse areas for which remedial alternatives will be developed, and will describe the RAOs, application of risk assessment results, ARARs, land use control guidelines that will be applied in the development of remedial alternatives, and ongoing and future MEC-related activities at the former Fort Ord that are components of the Army’s base-wide efforts to promote MEC safety.
- **Section 3 – Identification of Applicable Response Actions.** This section will identify the range of applicable response actions for MEC risk management at the Group 1 MRAs, such as no further action, land use controls, and additional MEC remediation.
- **Section 4 – Development of Remedial Alternatives.** This section will present long-term management measures specific to implementation and management of the remedial alternatives selected for Group 1, and will also include a screening of response action components, development of remedial alternatives, and identification of potential ARARs associated with implementation.
- **Section 5 – Evaluation and Comparison of Remedial Alternatives.** This section will present an evaluation and comparison of potential remedial alternatives for each of the reuse areas in the Group 1 MRAs.
- **Section 6 – Identification of the Preferred Remedial Alternative.** This section will present and summarize the preferred remedial alternative for each reuse area.
- **Section 7 – Approval Process.** This section will describe the approval process for documenting the preferred alternatives for implementation at each of the Group 1 reuse areas in the RI/FS Proposed Plan and ROD.
- **Section 8 – References.** This section will provide a list of references for pertinent documents cited in the report.

6.2 Schedule

An anticipated project schedule has been prepared that identifies the key components of the work in chronological order, including document deliverables and important project milestones. The anticipated project schedule is presented in Appendix D. For planning and reporting purposes, regulatory review periods are included, but are subject to change based on the level of effort required to incorporate review comments and review period extension requests. A summary of project milestones and associated dates from the anticipated schedule is provided in Table 2.

The associated tasks and project progress will be tracked monthly on the schedule to show actual project status compared to the initial project schedule in order to better evaluate the reasons for progress variances and to identify overall impact to project duration.

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