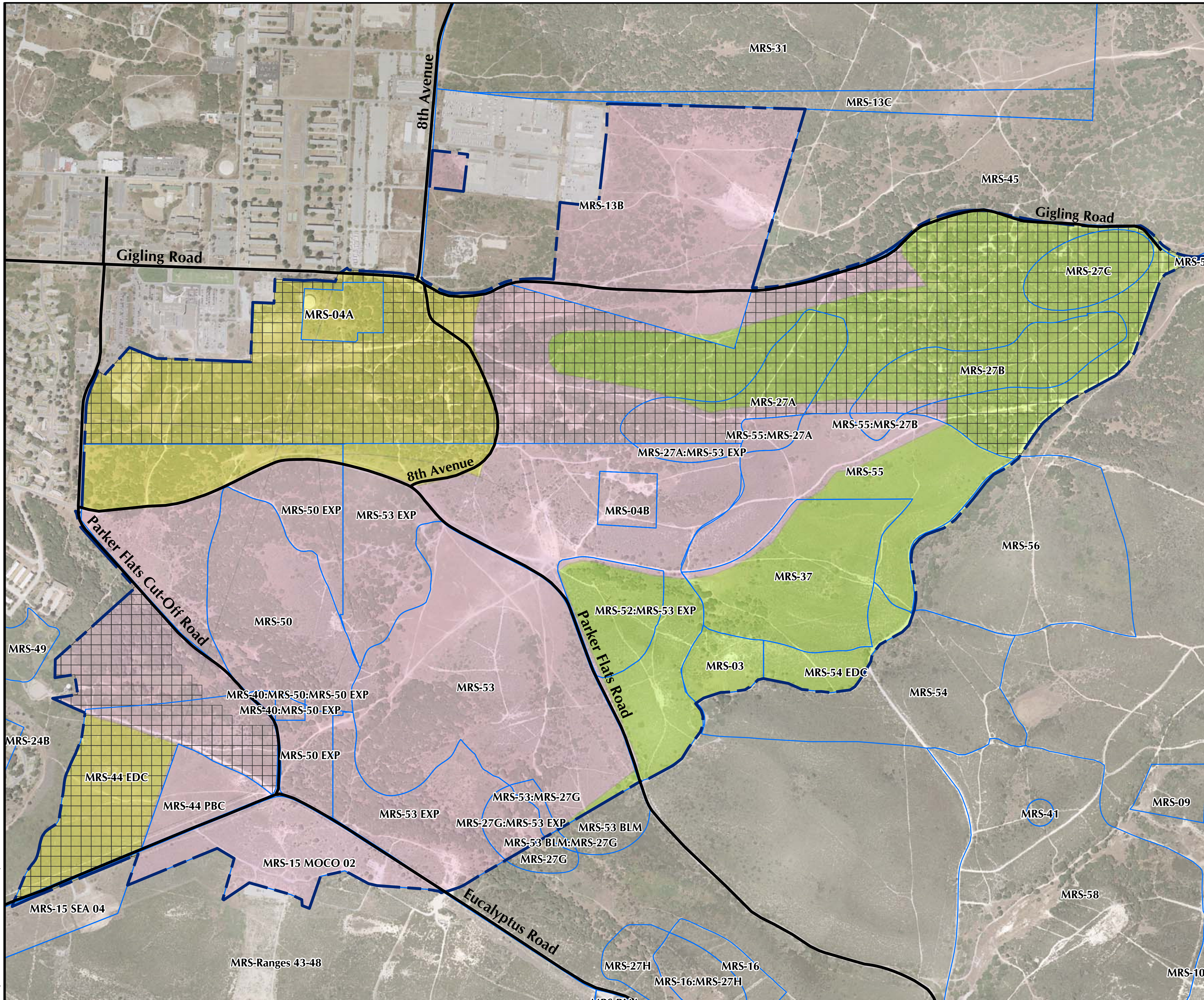
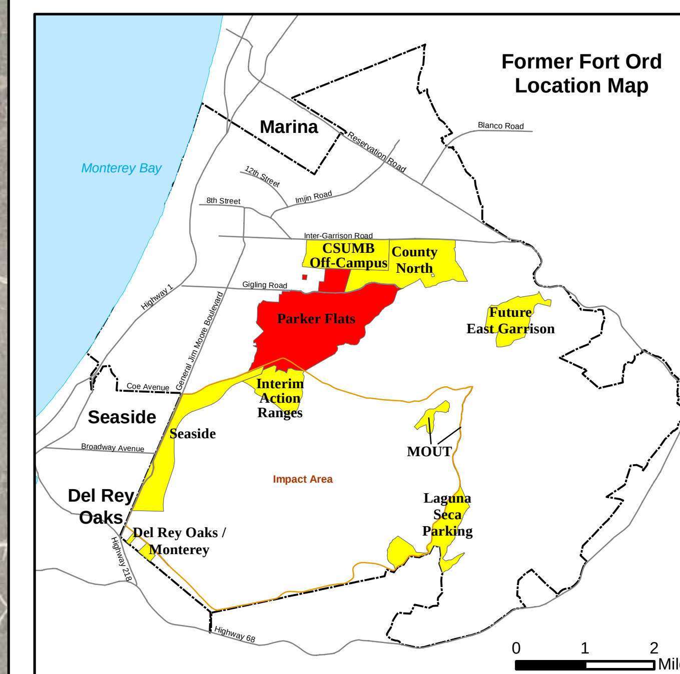
APPENDIX A

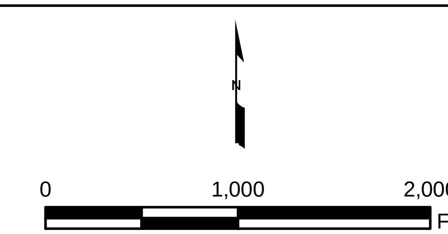
Maps



Legend

- Munitions Response Area
- Major Road
- MRS-53 Munitions Response Site
- 100-foot Grid System
- Residential Development
- Non-Residential Development
- Habitat Reserve





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WESTON SOLUTIONS

Westcliffe Engineers, Inc.

Parker Flats MRA Phase II
100-Foot Grid System

FORA ESCA RP
Monterey County, California

Figure A-1

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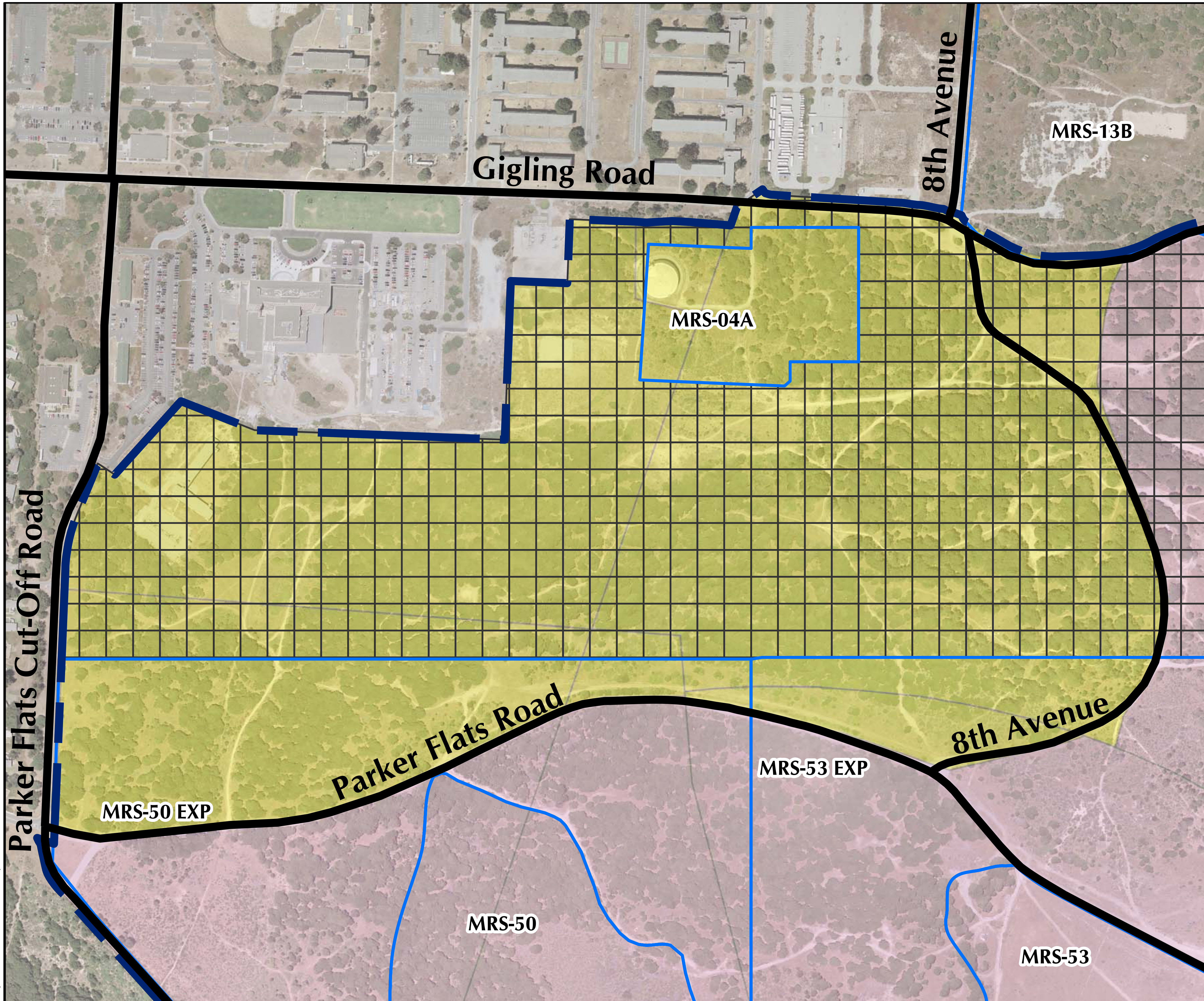
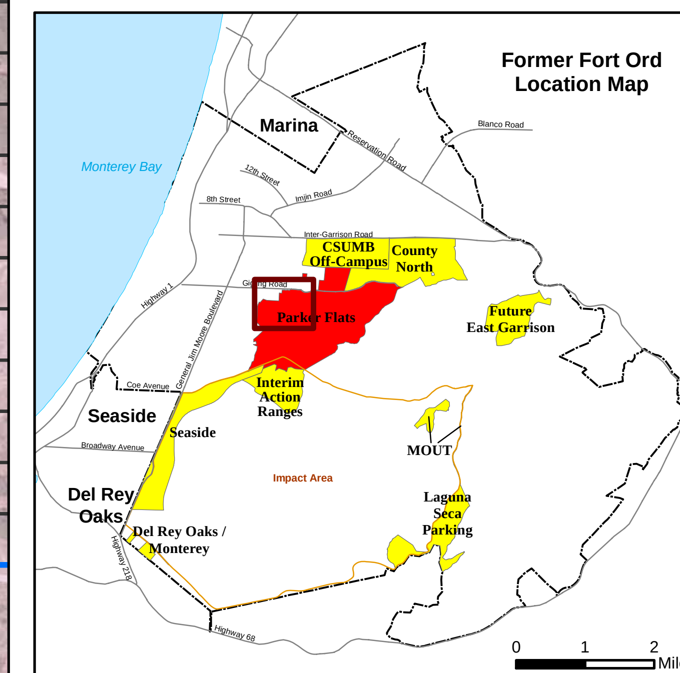


Legend

- Munitions Response Area
- Major Road
- MRS-53 Munitions Response Site
- 100-Foot Grid System
- Residential Development
- Non-Residential Development
- Habitat Reserve



N

0 350 700 Feet

LFR
WESTON SOLUTIONS
Westcliffe Engineers, Inc.

Parker Flats MRA Phase II
100-Foot Grid System
Northwestern Portion

FORA ESCA RP
Monterey County, California

Figure A-2

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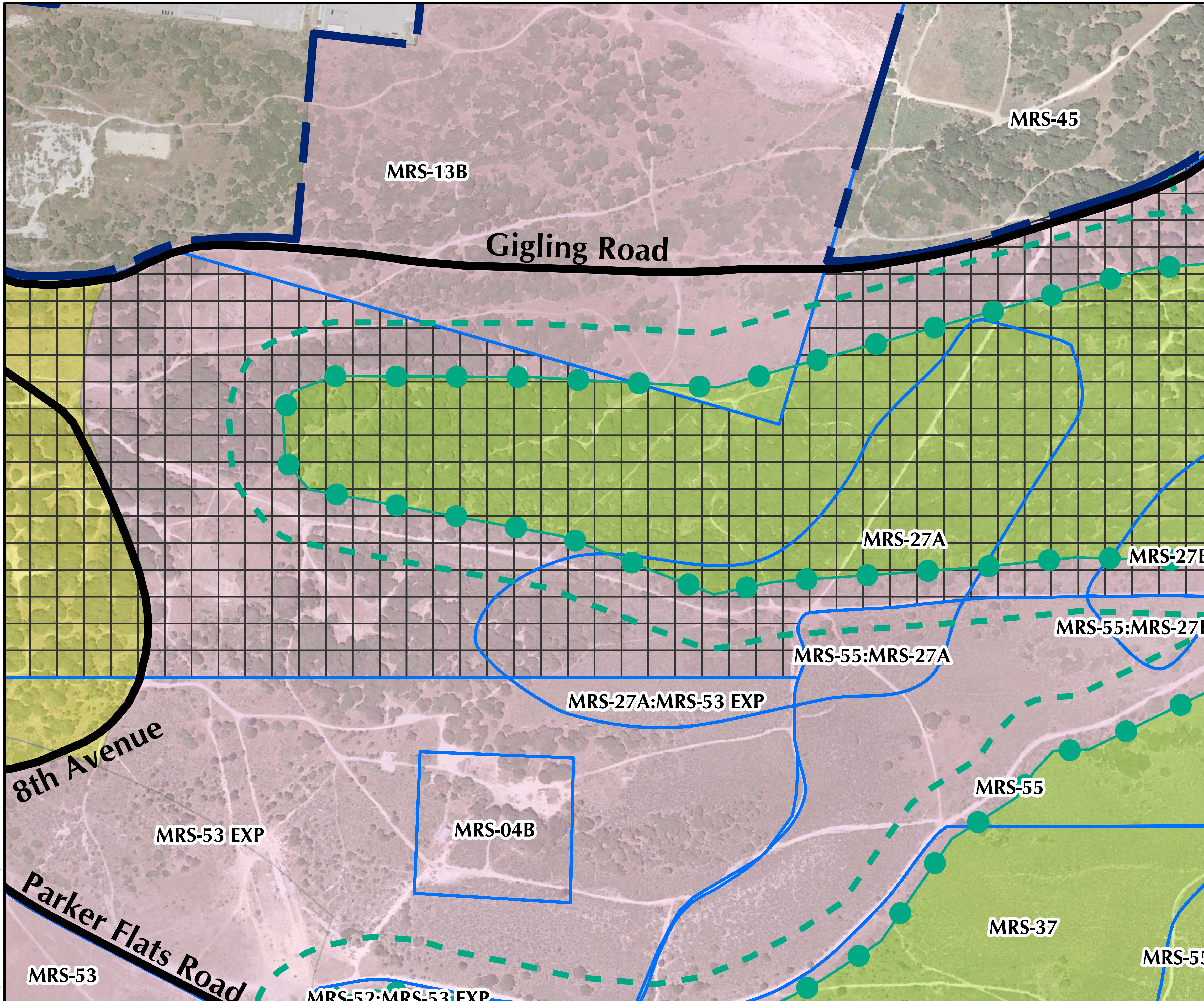
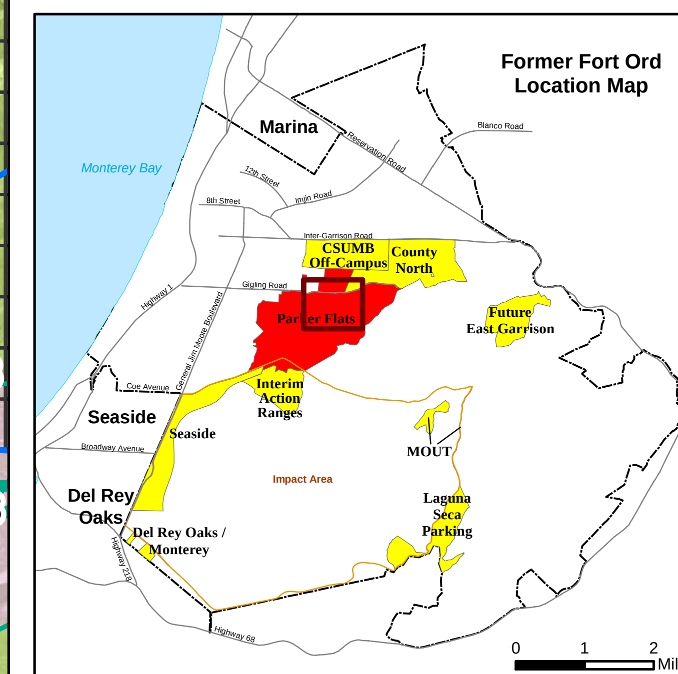


Legend

- Munitions Response Area
- Major Road
- MRS-53 Munitions Response Site
- 100-Foot Grid System
- Residential Development
- Non-Residential Development
- Habitat Reserve
- Borderland Interface with 200-Foot Buffer
- High-Power Transmission Line and Right of Way



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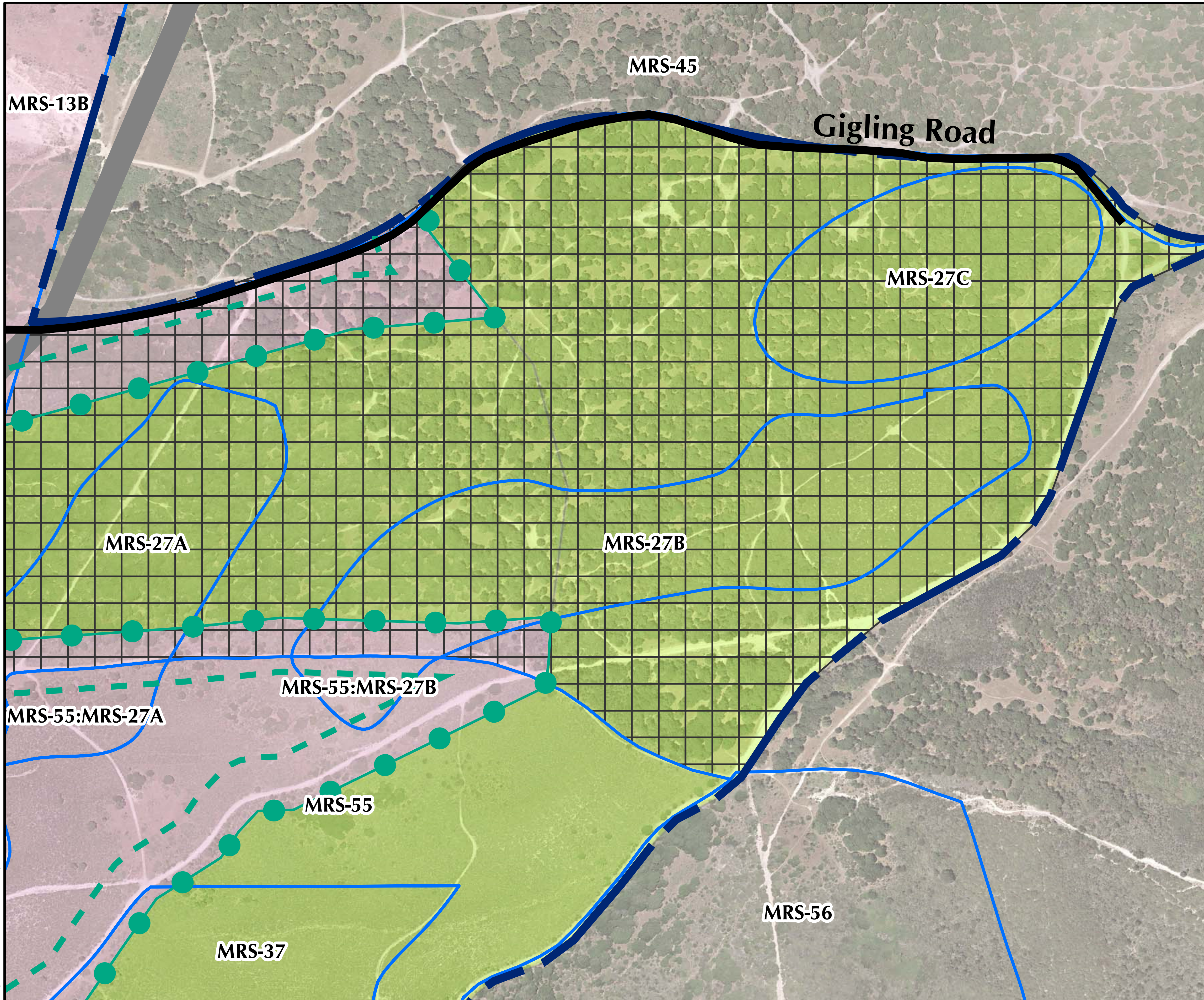
WESTON SOLUTIONS

Westcliffe Engineers, Inc.

Parker Flats MRA Phase II
100-Foot Grid System
North Central Portion

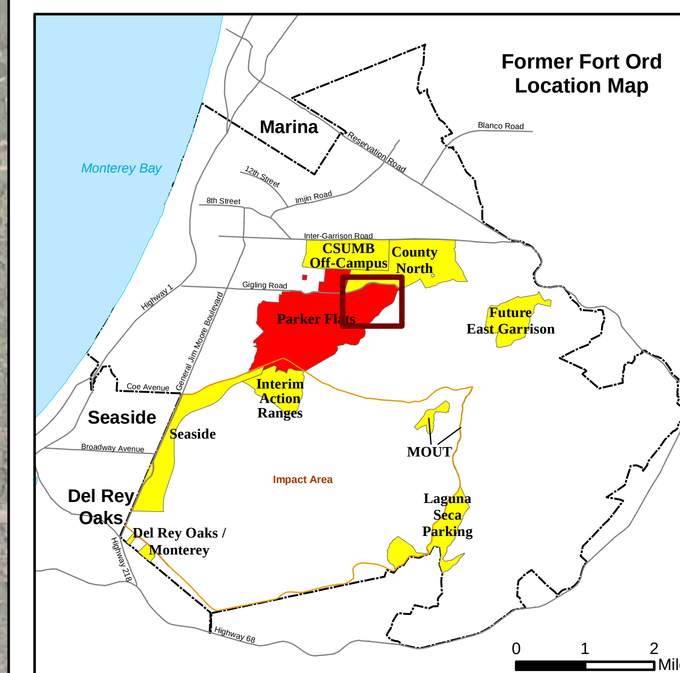
FORA ESCA RP
Monterey County, California

Figure A-3



Legend

- Munitions Response Area
- Major Road
- MRS-53 Munitions Response Site
- 100-Foot Grid System
- Residential Development
- Non-Residential Development
- Habitat Reserve
- Borderland Interface with 200-Foot Buffer
- High-Power Transmission Line and Right of Way



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WESTON SOLUTIONS

Westcliffe Engineers, Inc.

Parker Flats MRA Phase II
100-Foot Grid System
Northeastern Portion

FORA ESCA RP
Monterey County, California

Figure A-4

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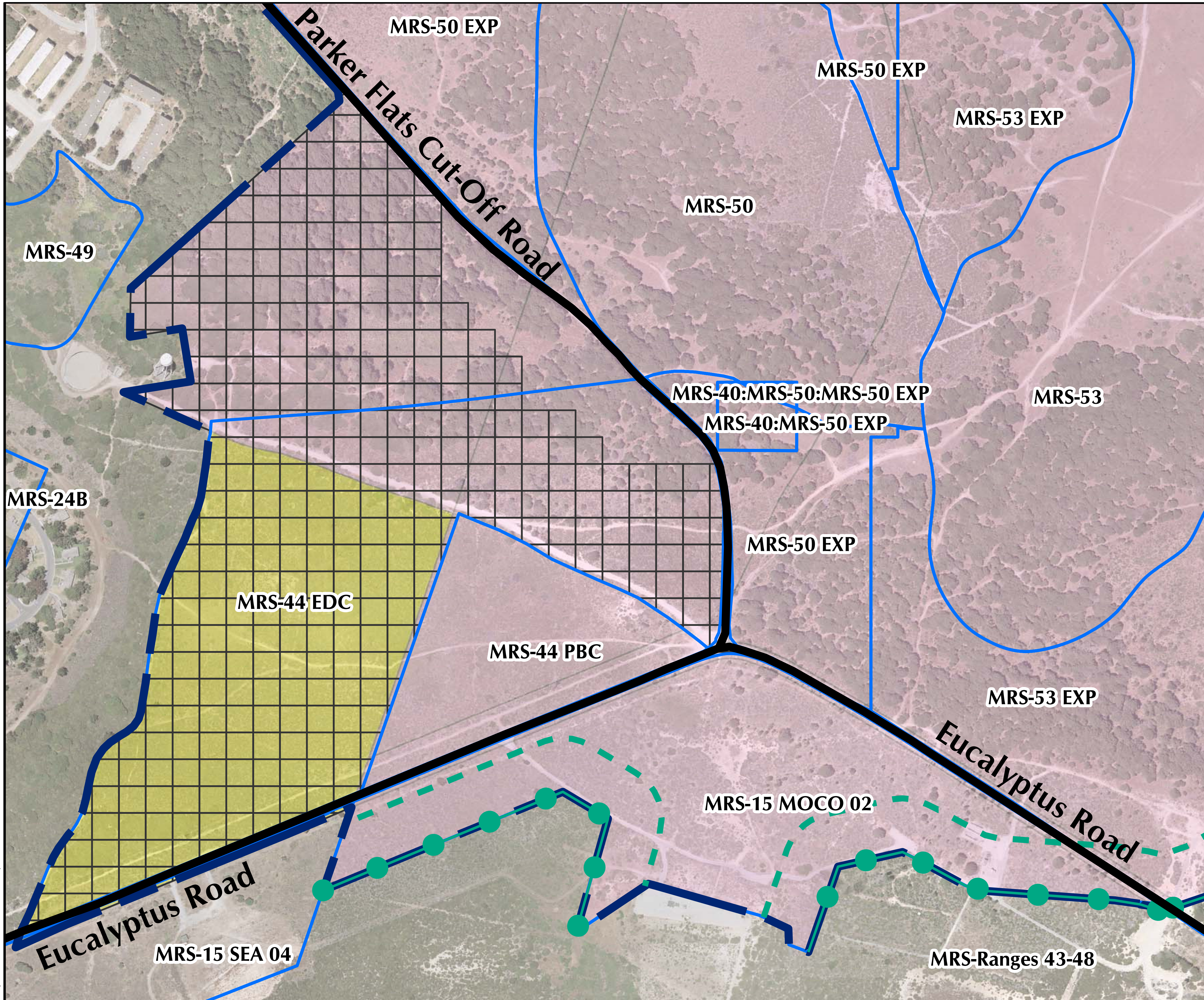
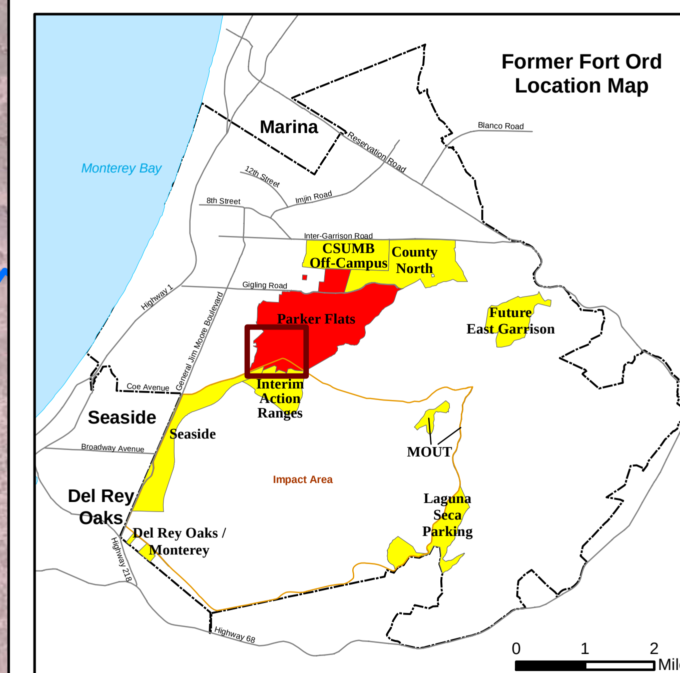


Legend

- Munitions Response Area
- Major Road
- MRS-53 Munitions Response Site
- 100-Foot Grid System
- Residential Development
- Non-Residential Development
- Habitat Reserve
- Borderland Interface with 200-Foot Buffer
- High-Power Transmission Line and Right of Way



N

0 350 700 Feet

LFR
WESTON SOLUTIONS
Westcliffe Engineers, Inc.

Parker Flats MRA Phase II
100-Foot Grid System
Southwestern Portion

FORA ESCA RP
Monterey County, California

Figure A-5

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APPENDIX B

MEC Data

Parker Flats MRA Phase II – Types of MEC Removed and Hazard Classification

MEC ITEMS	UXO	DMM	ISD	Hazard Classification
Cap, blasting, electric, M6	3	1	0	1
Cartridge case, 40mm (projectile removed/case intact)	0	1	0	1
Cartridge, 40mm, practice, M781	0	4	0	1
Cartridge, grenade, auxiliary, M7	8	0	0	1
Charge, 0.25 lb, demolition, TNT	0	1	0	2
Charge, nitrostarch, 0.25 lb *	0	0	0	2
Cord, detonating	1	1	0	NS
Flare, aircraft, parachute, M9A1	1	0	0	2
Flare, surface, trip, M49 series	3	0	0	1
Fuze, grenade, hand, M10 series	0	443	0	1
Fuze, grenade, hand, M204 series	0	2	0	1
Fuze, grenade, hand, practice, M205 series	228	104	0	1
Fuze, grenade, hand, practice, M228	17	10	0	1
Fuze, projectile, combination, M1907	1	0	0	1
Fuze, projectile, point detonating, M48 series	1	0	0	2
Grenade, hand, fragmentation, MK II	1	0	0	3
Grenade, hand, illumination, MK I	8	0	0	1
Grenade, hand, practice, M69	1	0	0	1
Grenade, hand, practice, MK II	12	0	0	1
Grenade, hand, smoke, M18 series	12	0	0	1
Grenade, rifle, antitank, M9 series	1	0	0	3
Grenade, rifle, smoke, M22 series	0	2	0	1
Pot, 2.5 lbs, smoke, HC, screening, M1	1	0	0	1
Primer, ignition, percussion, M82	8	0	0	1
Projectile, 22mm, subcaliber, practice, M744	10	0	0	1
Projectile, 40mm, cluster, white star, M585	1	0	0	1
Projectile, 40mm, high explosive, M406	2	0	0	3
Projectile, 40mm, parachute, illumination, M583 series	1	0	0	1
Projectile, 57mm, high explosive, M306 series	1	0	0	3
Projectile, 60mm, mortar, illumination, M83 series	1	0	0	2
Projectile, 75mm, high explosive, MK I	2	0	0	3
Projectile, 75mm, Shrapnel, MK I	3	0	0	3

Parker Flats MRA Phase II – Types of MEC Removed and Hazard Classification

MEC ITEMS	UXO	DMM	ISD	Hazard Classification
Propellant, 60mm, wafers, mortar	2	0	0	1
Pyrotechnic mixture, illumination	7	0	0	1
Rocket, 35mm, subcaliber, practice, M73	7	0	0	1
Signal, ground, rifle, parachute, M17 series	1	0	0	1
Signal, illumination, aircraft, AN-M37 series	3	0	0	1
Signal, illumination, ground, M125 series	7	0	0	2
Simulator, projectile, airburst, M74 series	4	0	0	1
Simulator, projectile, ground burst, M115A2	6	0	0	2
High explosive, 40mm (model unknown)	0	0	1	NS
PHASE II AREA TOTAL	**365**	**569**	**1**	

Notes:
MRA – Munitions Response Area
MEC – munitions and explosives of concern
UXO – unexploded ordnance
DMM – discarded military munitions
ISD – insufficient data (materials potentially presenting an explosive hazard that could not be classified as UXO, DMM, or Munitions Debris)
mm – millimeter
lbs – pounds
NS – not specified
TNT – trinitrotoluene
HC – hexachloroethane
* – Military Munitions Response Program (MMRP) Database identified item as UXO with a quantity of zero.
Reference: Ford Ord MMRP Database

Please note: Munitions descriptions have been taken directly from the Army's MMRP Database and/or other historical documents. Any errors in terminology, filler type, and/or discrepancies between model number and caliber/size are a result of misinformation from the data sources.

Hazard Classification	Description
0	Inert munitions item that will cause no injury
1	MEC that will cause an injury or, in extreme cases, could cause major injury or death to an individual if functioned by an individual's activities
2	MEC that will cause major injury or, in extreme cases, could cause death to an individual if functioned by an individual's activities
3	MEC that will kill an individual if detonated by an individual's activities

APPENDIX C

Building Demolition and Removal Plan

FORA ESCA REMEDIATION PROGRAM

Appendix C: Building Demolition and Removal Plan

DRAFT FINAL
Group 1 Remedial Investigation / Feasibility Study Work Plan

Volume 2 - Sampling and Analysis Plan

Parker Flats Munitions Response Area Phase II

Former Fort Ord
Monterey County, California

November 13, 2008

Prepared for:

FORT ORD REUSE AUTHORITY

100 12th Street, Building 2880
Marina, California 93933

Prepared Under:

Environmental Services Cooperative Agreement
No. W9128F-07-2-01621
and
FORA Remediation Services Agreement (3/30/07)

Document Control Number: 09595-08-086-005

Prepared by:

LFR

WESTON SOLUTIONS

Westcliffe Engineers, Inc.

CONTENTS

ACRONYMS AND ABBREVIATIONS

ACM	asbestos-containing material
AIHA	American Industrial Hygiene Association
Army	United States Department of the Army
Cal-OSHA	California Occupational Safety and Health Administration
DHS	Department of Health Services
DI	deionized
DTSC	Department of Toxic Substances Control
EDDs	electronic data deliverables
EPA	U.S. Environmental Protection Agency
ESCA RP	Environmental Services Cooperative Agreement Remediation Program
FORA	Fort Ord Reuse Authority
LBP	lead-based paint
LCS	laboratory control samples
LFR	LFR Inc.
MBUAPCD	Monterey Bay Unified Air Pollution Control District
MEC	munitions and explosives of concern
mg/kg	milligrams per kilogram
MRA	Munitions Response Area
MS	matrix spike
NESHAP	National Emission Standards for Hazardous Air Pollutants
OSHA	Occupational Safety and Health Administration
QA/QC	quality assurance/quality control
RI/FS	Remedial Investigation and Feasibility Study
UXO	unexploded ordnance
WESTON	Weston Solutions, Inc.

C-1.0 INTRODUCTION

The Parker Flats Munitions Response Area (MRA) is divided into two areas: Parker Flats MRA Phase I and Parker Flats MRA Phase II (Figure C-1). The Parker Flats MRA Phase I has a Proposed Plan and pending Record of Decision. The Parker Flats MRA Phase II has been identified as requiring further remediation activities for munitions and explosives of concern (MEC). A variety of structures exist within the Parker Flats MRA that were used to support range activities. This Building Demolition and Removal Plan addresses the structures that exist within the Parker Flats MRA Phase II.

The Parker Flats MRA Phase II is comprised of a portion of parcels E19a.1, E19a.3, and E19a.4 and all of parcels E18.1.3, E18.4, and E19a.2. A listing of the existing structures within the Phase II area of the Parker Flats MRA is provided in Table C-1, which is based on the United States Department of the Army ("Army") buildings and structures database and a site reconnaissance conducted in 2008 by the Environmental Services Cooperative Agreement Remediation Program (ESCA RP) Team. As summarized in Table C-1, six of the 21 existing structures require demolition to accommodate the additional MEC remediation activities because the structures are located within areas designated for future residential use. More detailed views of the locations of the 21 structures are shown on Figures C-2, C-3, C-4, and C-5, as indicated in Table C-1.

Seven of the 21 structures within the Parker Flats MRA Phase II were identified in the Army's buildings and structures database as previously destroyed; however, the site reconnaissance conducted by the ESCA RP Team determined that the structures still exist. These structures are identified as: 4B57, 4B58, and 4B60 on Parcel E19a.2 (Figure C-3); 2028A on parcel E19a.3 (Figure C-3); and R393, 4A26, and 4A27 on parcel E19a.4 (Figure C-4). In addition, the site reconnaissance identified seven additional concrete pads or foundations (B-1, B-2A, B-2B, B-3, B-4, B-5, and B-6) within the Parker Flats MRA Phase II of which four (B-1, B-2A, B-2B, and B-3) were located within areas designated for future residential use and, therefore, require removal to complete the remediation activities for MEC (Table C-1).

The Army performed preliminary asbestos surveys in 1993 and identified the presence of asbestos-containing materials (ACM) in some of the structures. However, the Army's survey was not in compliance with current National Emission Standards for Hazardous Air Pollutants (NESHAP) demolition requirements and additional building characterization will be required prior to demolition activities. A description of the pre-demolition sampling program, demolition activities, and post-demolition clearance criteria is presented in the scope of work section found below.

Table C-1
Parker Flats MRA Phase II - Existing Structures

Parcel Number	Facility Number	Description	Demolition Required	Figure
Future Residential Parcels				
E18.1.1	B-1	Concrete Pad/Foundation	Yes	C-2
E18.1.3	4386	Enlisted Barracks	Yes	C-2
E18.1.3	4387	Enlisted Barracks	Yes	C-2
E18.1.3	4476	Softball Field	No	C-2
E18.1.3	B-2A	Concrete Pad/Foundation	Yes	C-2
E18.4	4475	Water Tower	No	C-2
E19a.1	B-2B	Concrete Pad/Foundation	Yes	C-2
E19a.1	B-3	Concrete Pad/Foundation	Yes	C-2
Future Nonresidential Parcels				
E19a.3	2028A	Field Range Latrines	No	C-3
E19a.3	3950	Rappelling Tower	No	C-3
E19a.3	4A34	Field Range Latrines	No	C-3
E19a.3	4B56	Field Range Latrines	No	C-3
E19a.3	4B77	Field Range Latrines	No	C-3
E21b.3	R9441	Field Range Latrines	No	C-5
E21b.3	B-6	Concrete Pad/Foundation	No	C-5
E21b.3	3991	Covered Training Area	No	C-5
Future Habitat Reserve				
E19a.2	4B57	Field Range Latrines	No	C-3
E19a.2	4B58	Field Range Latrines	No	C-3
E19a.2	4B60	Field Range Latrines	No	C-3
E19a.2	B-4	Concrete Pad/Foundation	No	C-3
E19a.2	B-5	Concrete Pad/Foundation	No	C-3
E19a.4	R391	Relocatable Building	No	C-4
E19a.4	R392	Relocatable Building	No	C-4
E19a.4	R393	Relocatable Building	No	C-4
E19a.4	4A26	Field Range Latrines	No	C-4
E19a.4	4A27	Field Range Latrines	No	C-4
E19a.4	4A60	Field Range Latrines	No	C-4

C-2.0 SCOPE OF WORK

The ESCA RP Team, which includes LFR Inc. (LFR), Weston Solutions, Inc. (WESTON), and Westcliffe Engineers, Inc., and qualified subcontractors will perform the appropriate testing and demolition activities to complete the removal of the seven structures. Work will be conducted in accordance with federal, state, and local regulations regarding building demolition, asbestos abatement, and lead stabilization. A description of each of these tasks is presented below.

Unexploded ordnance (UXO) escorts and a UXO Technician II (or above) will be provided by WESTON for all field-related activities as identified in this scope of work. Additionally, MEC recognition training will be required for all subcontractors involved with field activities. If a MEC is encountered, the UXO escorts should be notified immediately, and appropriate MEC response activities will be conducted by the appropriate field personnel.

C-2.1 Pre-Demolition Activities

C-2.1.1 Building Material Survey

A full demolition-level asbestos survey of structures 4386 and 4387 will be performed. Asbestos surveys are not required for the concrete pads/foundations identified as B-1, B-2A, B2-B, and B-3. A demolition-level survey to comply with NESHAP requires accessing chases, wall cavities, roofing, and decking. As part of these activities, materials whose disposal methods may be regulated (e.g., mercury vapor lamps, fluorescent lighting, and heating, ventilating, and air conditioning systems containing refrigerant [as applicable]) will be quantified.

The quantity and location of the asbestos samples collected will be based on in-house sampling protocol, which is based on the U.S. Environmental Protection Agency (EPA) Asbestos Hazard Emergency Response Act regulations. Asbestos sample analysis will be performed using polarized light microscopy with dispersion staining in accordance with EPA Method EPA-600/R-93/116 at a laboratory accredited by the American Industrial Hygiene Association (AIHA) and the California Department of Health Services (DHS).

Survey work will be performed by a qualified and licensed asbestos inspector(s) who has completed an EPA-approved training course for building inspection, and who has a minimum of one year of experience in performing asbestos building inspections. The inspection work will be conducted under the direct oversight of a California Certified Asbestos Consultant.

Following the receipt of laboratory results, a summary report will be prepared for the MRA detailing the survey results. The report will provide an inventory and locations of confirmed ACM, laboratory analysis results, and an inventory of observed regulated materials.

C-2.1.2 Pre-Demolition Lead Characterization

As part of the building survey activities, lead characterization activities will be conducted. This will include the collection of:

- representative paint chip samples for lead to help evaluate Occupational Safety and Health Administration (OSHA) work practices during demolition activities
- representative composite building samples for waste characterization in accordance with American Society for Testing and Materials Standard E 1908-97

Lead and Waste Extraction Test sample analyses will be performed by flame atomic absorption spectroscopy, using EPA Method SW-846/7420 at a laboratory accredited by AIHA and DHS.

C-2.1.3 Pre-Demolition Composite Soil Sampling

Due to the potential that structure demolition activities may release lead-based paint (LBP) into nearby soils, composite soil sampling will be conducted in the perimeter driplines of the painted structures to provide a baseline level of lead in soil. In these areas, composite samples will be collected, which will consist of five to eight aliquots from surface (0 to 3 inches) soils surrounding the structures. One composite soil sample will be collected from each of the painted structures. Each composite sample will contain no greater than eight aliquots, and at least one sample will be collected from each side of the building where exposed soil is present. Samples will be collected from areas with the highest likelihood of elevated lead in soil (at areas of flaking paint or in driplines within 2 feet of the building). If the structure is unpainted, or if there is no exposed soil, pre-demolition sampling activities will not be required.

If pre-demolition soil samples show that the soil surrounding the structures contains greater than 203 milligrams per kilogram (mg/kg) of lead, the soil will be marked for removal after MEC clearance activities. If lead-affected soil is shown to be present greater than 10 feet out from the building’s perimeter, then the source of the elevated lead in soil may not be flaking LBP. In this case the soil sampling program will be halted at this structure and a revised plan to characterize soil in the area will be developed and submitted to the Department of Toxic Substances Control (DTSC) for approval.

C-2.1.4 Soil Sampling Quality Assurance and Quality Control

Field

Chain-of-custody forms will be prepared for groups of samples collected at a given location on a given day. Each chain-of-custody form will be prepared in triplicate. Two of the three copies (white and pink) will accompany each shipment of samples to the laboratory. The yellow copy is kept in the quality assurance/quality control (QA/QC) file and the pink copy is kept in the project file. The chain-of-custody form documents the identity of all personnel involved in sample transfer.

For QA/QC purposes, one blind field duplicate soil sample will be collected for every 10 composite soil samples collected, with a minimum of one duplicate sample per day. The duplicate sampling program represents greater than 10 percent of the total number of samples proposed for analysis. One equipment blank and one trip blank will be collected per batch of samples submitted to the laboratory. Equipment blanks will be collected by preparing sample containers and collection trowels or scoops as if a soil sample will be collected. Distilled or deionized (DI) water will then be poured over the sampling trowel or scoop. As the distilled or DI water is poured over the trowel or scoop a sample container will be used to collect the runoff water from the trowel or scoop. The sample container with the runoff water will then be sealed, labeled, and logged as described herein. One equipment blank will be analyzed for each phase of sampling. The remaining equipment blanks will be collected and submitted to the laboratory on hold. The trip blank will only be analyzed if detectable levels of lead are found in the equipment blank. Additional blanks may be analyzed by the laboratory if sample contamination is suspected.

Sampling equipment (stainless steel trowel or scoop) that comes into contact with potentially affected soil will be decontaminated consistently to ensure the quality of samples collected. As appropriate, disposable equipment intended for one-time use may be used and will not be decontaminated, but will be packaged for appropriate disposal.

Laboratory

QA/QC procedures to be used by the laboratory will include analysis of method blanks, duplicates, matrix spike (MS), and laboratory control samples (LCS). One data batch will include a Level 3 data package, which includes initial calibration and calibration verification summaries for each instrument and analytical sequence, copies of instrument run logs, and sample preparation bench book entries.

A review of the laboratory's internal QC results will include an evaluation of laboratory duplicates, MS, duplicate percent recoveries, method blanks, and LCS. The following quality control limits are to be used in evaluating the data:

Method 6010B QC Limits				
Compound	**LCS/BS/BSD Recovery**	**BS/BSD RPD**	**MS/MSD Recovery**	**MS/MSD RPD**
Lead	70 - 120	20	46 – 128	39

Notes:
LCS = Laboratory Control Sample
BS = Blank Spike
BSD = Blank Spike Duplicate
MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference

Appropriate qualifiers will be applied to the data, as necessary, based on the data validation review. Laboratory analytical results and QC data will be reported as electronic data deliverables (EDDs) to reduce the potential for transcription errors. EDDs will be entered into a database to facilitate data retrieval and evaluation.

Data validation will include a review of field procedures and documentation for completeness and accuracy, verification of appropriate custody control of samples, and a review of laboratory records to verify that appropriate sample preservation and holding times are achieved.

Documentation

In addition to the chain-of-custody forms, daily construction logs will be kept throughout the soil removal and soil sampling activities. The construction logs will identify the contractors on site, any job-specific training conducted on site, removal procedures, depths and extents of each excavation area, a visible description of the excavation detailing whether paint chips are present, soil sampling collection times, any areas requiring additional excavation, and general site observations. Logs will be completed daily, and copies of the daily logs will be submitted with the RI/FS report that will be prepared for the Group 1 MRAs (Seaside and Parker Flats MRAs).

C-2.2 Abatement and Demolition

C-2.2.1 Asbestos Abatement

Following the completion of pre-demolition activities, an asbestos abatement contractor will conduct the removal of ACM from the structures prior to demolition. Asbestos abatement will involve the removal of asbestos from within regulated areas of the buildings in compliance with Monterey Bay Unified Air Pollution Control District (MBUAPCD) Rules 306, 402, and 439 and the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal-OSHA) regulations 8 CCR 1529 and 8 CCR 5208. Waste generated from the asbestos abatement activities will be containerized, profiled, and disposed of in accordance with DTSC regulations outlined in Title 22 CCR Division 4.5.

Following the completion of abatement activities a California Certified Asbestos Consultant or Certified Site Surveillance Technician will conduct a visual clearance of the work areas to confirm that the identified ACM has been removed and that the work area has been sufficiently cleaned.

C-2.2.2 Lead Stabilization

Prior to demolition activities a deleading contractor will remove loose and flaking LBP from the structures using DHS-certified lead-related construction workers and supervisors. The contractor will lay out drop cloths beneath the work area and conduct the removal operations using wet methods. Work will be conducted using the containment requirements outlined in the DHS lead hazard control regulation detailed in DHS Title 17. LBP stabilization will be conducted in accordance with Cal-OSHA's Lead in Construction standard found in 8 CCR Section 1532.

Paint chips generated by the deleading activities will be containerized, profiled, and disposed of in accordance with DTSC regulations outlined in Title 22 CCR Division 4.5.

Throughout the deleading activity, and when weather permits, one upwind and two downwind air samples will be collected for lead in order to determine the effectiveness of the lead hazard control techniques. The lead air sample results will be compared to the OSHA action level of 30 micrograms per cubic meter based on an 8-hour time-weighted average. Lead air samples will be analyzed at an AIHA- and DHS-accredited laboratory using National Institute for Occupational Safety and Health Method 7082.

Following the completion of lead stabilization activities, a visual clearance of the work area will be conducted to ensure that paint chips do not remain in the surrounding soils.

C-2.2.3 Demolition Activities

Following asbestos abatement and lead stabilization activities, each of the seven structures will be demolished and disposed of at an approved facility. A demolition contractor using 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) and Cal-OSHA lead awareness trained workers will demolish and dispose of the structures and associated foundations. Demolition activities will consist of:

1. Notify Underground Service Alert a minimum of 72 hours before start of excavation activities.
2. Cut and cap all utilities associated with the building (if any) in accordance with City of Seaside, Monterey County, Pacific Gas and Electric Company, SBC, and the Marina Coast Water District requirements.
3. Remove and dispose of or recycle the remaining regulated building components (if any) including chemicals; light ballasts; fluorescent tubes; mercury vapor lamps; refrigerant; mercury-containing thermostats, thermometers, and gauges; automotive equipment and parts; or similar materials detailed in the survey report.
4. Create a regulated area that includes impermeable drop cloths, plywood, or similar items to prevent paint chips from affecting soils.
5. Demolish buildings onto existing foundations using wet methods following MBUAPCD Rules 402 and 439. If weather permits, the oversight consultant will continue collecting perimeter lead-in-air samples as described in the Lead Stabilization Section C-2.2.2.
6. Break up and remove concrete foundations, slabs, and footings (if present).
7. Properly containerize waste and profile debris for waste disposal in accordance with Title 22 CCR Division 4.5.
8. Clean work area and equipment. All debris and paint chips shall be collected and properly containerized prior to a visual examination by the oversight consultant.

9. The oversight consultant will verify building debris and paint chips have been cleared from the work area.
10. The contractor will dispose of generated waste in accordance with applicable federal, state, and/or local regulations.
11. The oversight consultant will collect post-demolition soil samples to verify that the demolition activities did not create a lead-in-soil hazard as described in the Post-Demolition Soil Sampling Section C-2.3.1 and remove the soil as described in Sections C-2.3.2 and C-2.3.3.

C-2.3 Post-Demolition Activities

C-2.3.1 Post-Demolition Soil Sampling

At structures painted with LBP, post-demolition soil samples will be collected from exposed surficial soils (0 to 3 inches below ground surface) within and in the vicinity of the former structure location. One composite soil sample will be collected from each of the demolished structures. Each composite sample will contain no greater than eight aliquots, and at least one aliquot will be collected from each side of the former structure where exposed soil is present. Aliquots will be collected within 10 linear feet of the former structure's foundation line, distributed at random distances from the former foundation. If the composite sample shows lead levels greater than 203 mg/kg, and the lead-affected soil extends 10 feet out from the building perimeter or less, soil at the former structure location will be excavated and confirmation soil samples will be collected as described in Sections C-2.3.2 and C-2.3.3.

The lead-affected soil will be demarcated by either stakes or fencing in order to allow the contractor to locate the soil after the completion of demolition and/or MEC clearance activities.

The QA/QC procedures described in Section C-2.1.4 will be conducted during post-demolition soil sampling.

C-2.3.2 Soil Excavation Activities

If either the pre-demolition or post-demolition soil sampling discovers lead-affected soil in a structure's vicinity (within 10 feet of the former structure location), the contractor will use DHS-certified workers and supervisors to remove the lead-affected soil after the completion of MEC clearance activities. Earthmoving equipment will then be used to excavate the lead-affected soil, which would be temporarily stockpiled on plastic sheeting or in a closed-top dumpster pending waste characterization results and the determination of an appropriate disposal facility. The contractor will remove 1-foot lifts in increments of 3 feet out from the former structure location until confirmation soil samples show that the hot spot has been removed or until the excavation has extended 10 feet from the former structure's perimeter.

A water truck will be used to keep the excavation and surrounding area moist to minimize dust emissions. A real-time aerosol monitor will be used to measure dust emissions, and additional watering or other dust suppression methods will be conducted if airborne levels exceed action levels of 1 milligram per cubic meter above background conditions. Additionally, three lead-in-air samples will be collected during the soil excavation activities as described in Section C-2.2.2.

Following excavation and waste profiling, the affected soils will be loaded into a closed-top dumpster or covered truck and transported to the appropriate disposal facility. Loaded trucks will be checked for mud and dirt and cleaned, if necessary, before leaving the area. Prior to disposal, waste characterization samples will be collected and analyzed to establish an appropriate landfill for disposal.

C-2.3.3 Post-Excavation Soil Sampling

After excavation is completed, if no visible paint chips are present, then confirmation soil samples will be collected from the sidewalls and floor of the initial excavation areas and analyzed for lead. Additional soil will be removed, if necessary, until no visible paint chips are observed and confirmation sample results indicate that residual concentrations of lead are less than the cleanup level of 203 mg/kg, or until the excavation reaches 10 feet from the former structure's perimeter.

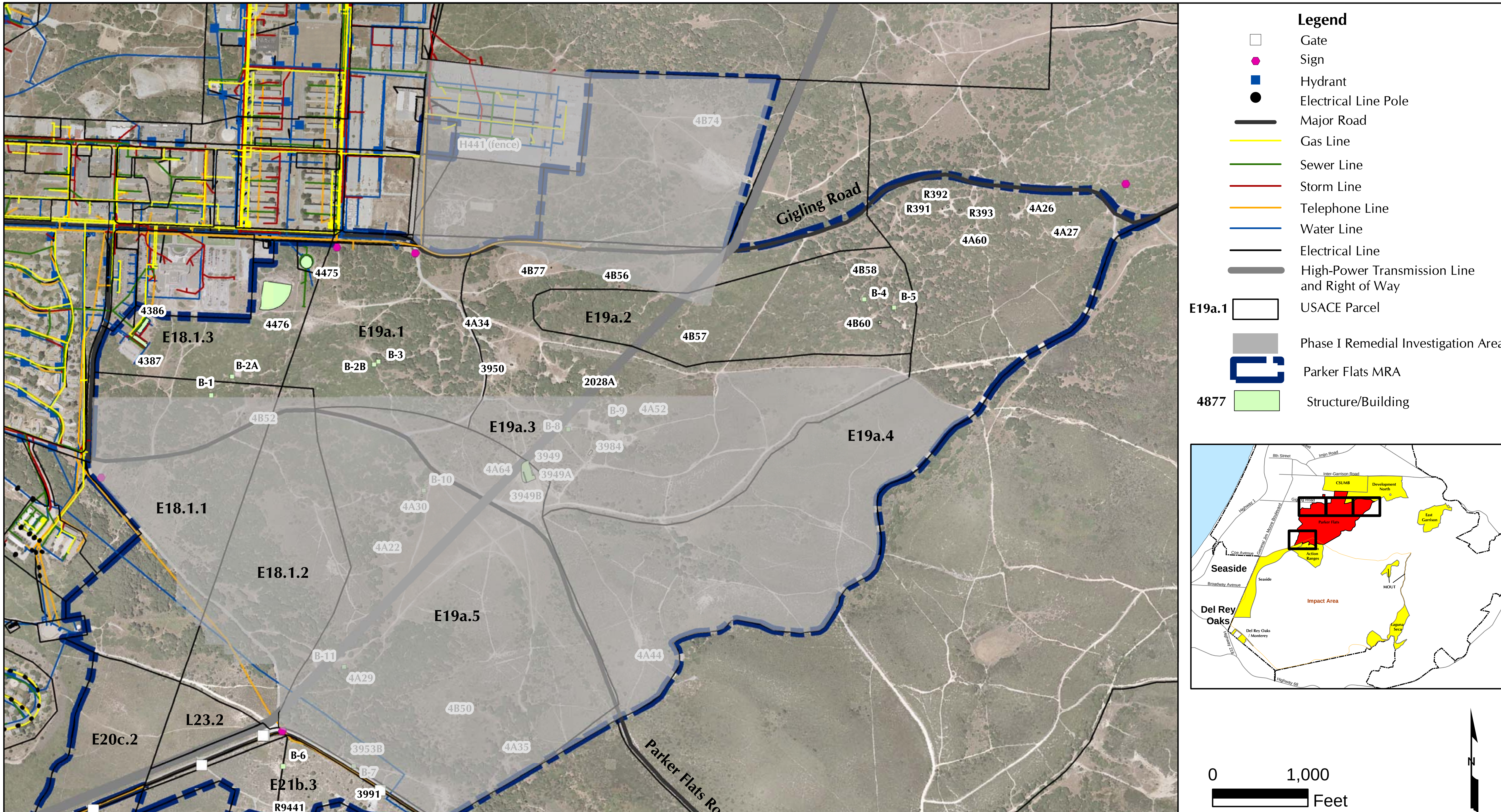
Confirmation composite samples will be collected from the sidewalls and floor of each excavation. One aliquot will be collected for every 50 linear feet along each sidewall. A minimum of three aliquots and a maximum of five aliquots will be collected from the sidewalls of each excavation. The sidewall samples may be collected from varying depths along the sidewall. The samples will be composited prior to analysis.

On excavation floors, one aliquot will be collected for every 200 square feet of excavation floor. No more than five aliquots will be collected from each excavation floor. Samples will be collected at varying distances from the foundation edge. The samples will be composited prior to analysis.

The QA/QC procedures described in Section C-2.1.4 will be conducted during the post-excavation soil sampling.

C-3.0 CLOSEOUT REPORT

Following the completion of the demolition activities and soil removal activities (if required), a closeout letter report describing the results of the soil sampling activities will be prepared. Additionally the closeout letter report for the remediation and demolition activities will be incorporated into the RI/FS report that will be prepared for the Group 1 MRAs (Seaside and Parker Flats MRAs). The report will provide a discussion of the abatement and demolition practices, air monitoring results, visual clearance certifications, photographs, and laboratory results.



Westcliffe Engineers, Inc.

Parker Flats MRA Buildings and Structures

FORA ESCA RP
Monterey County, California

Figure C-1

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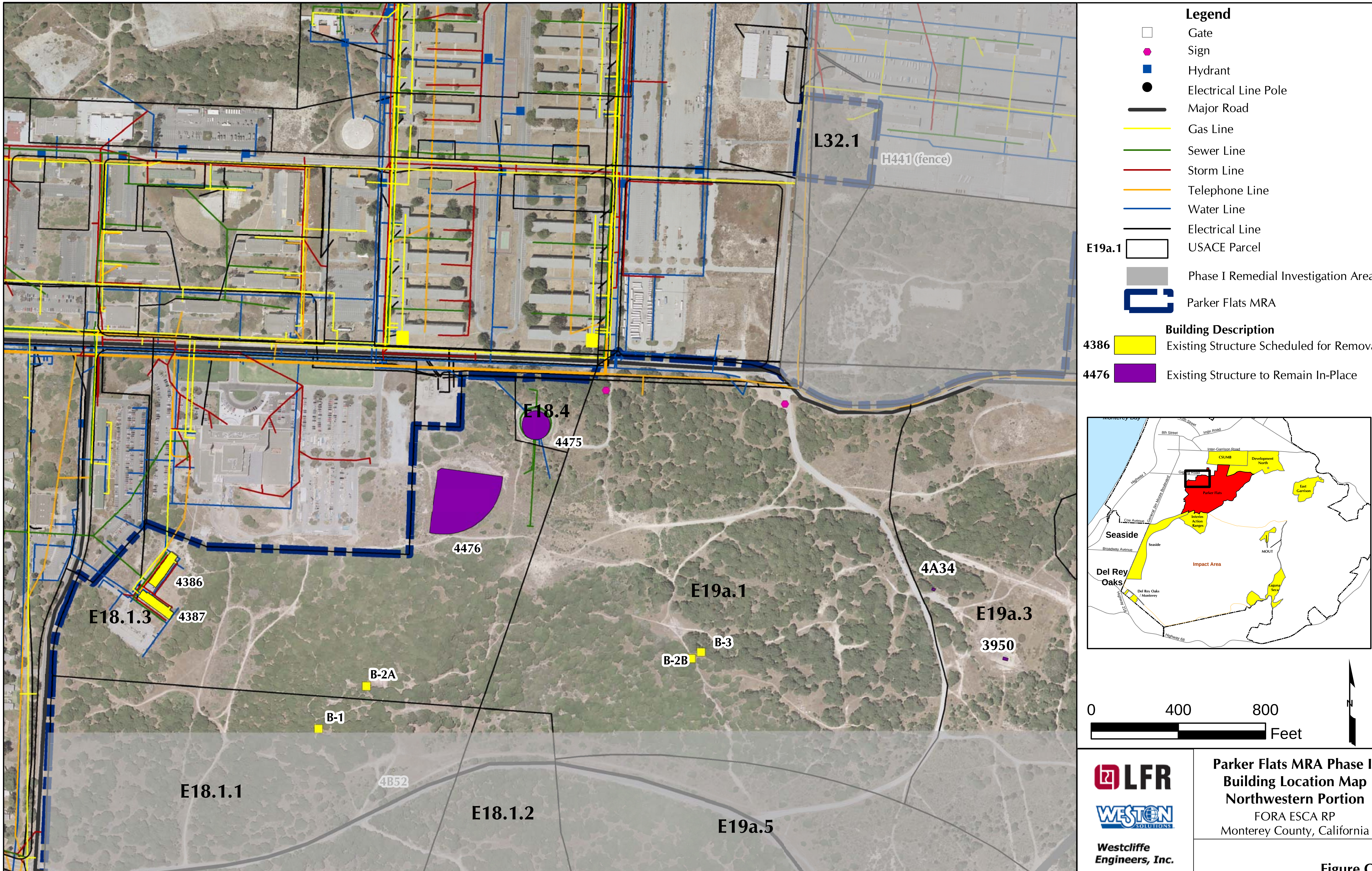

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WESTON SOLUTIONS

Westcliffe Engineers, Inc.

Parker Flats MRA Phase II Building Location Map Northwestern Portion

FORA ESCA RP
Monterey County, California

Figure C-2

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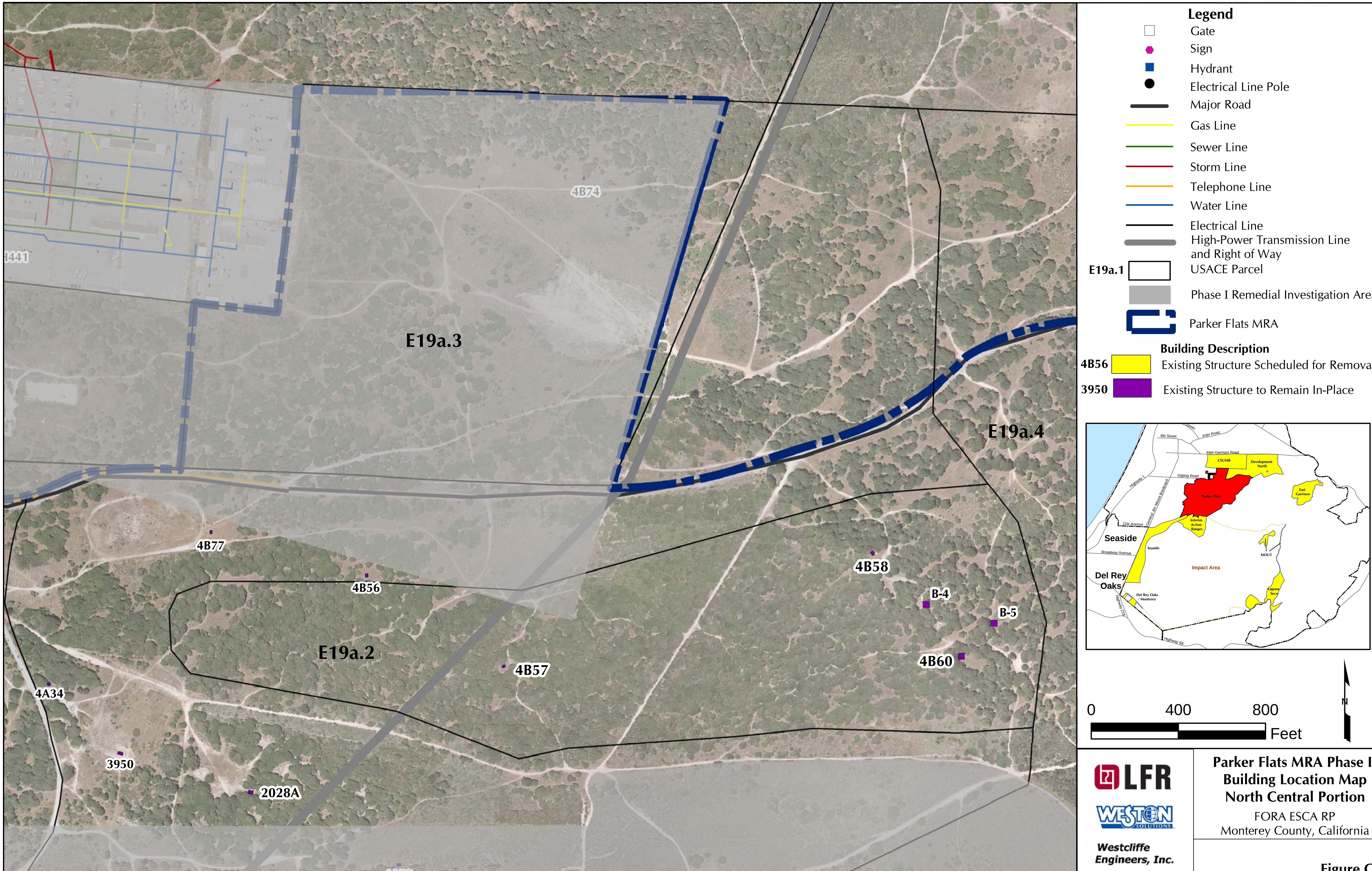

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WESTON SOLUTIONS
Westcliffe Engineers, Inc.

Parker Flats MRA Phase II
Building Location Map
North Central Portion
FORA ESCA RP
Monterey County, California

Figure C-3

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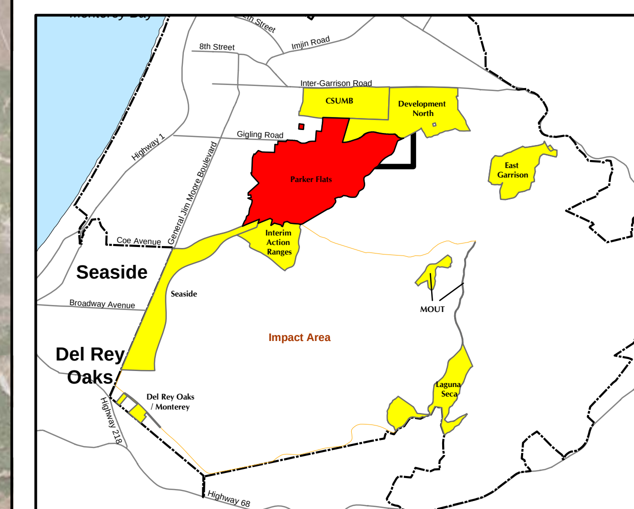
Legend

- Gate
- Sign
- Hydrant
- Electrical Line Pole
- Major Road
- Gas Line
- Sewer Line
- Storm Line
- Telephone Line
- Water Line
- Electrical Line
- E19a.1 USACE Parcel
- Phase I Remedial Investigation Area
- Parker Flats MRA

Building Description

- 4B77 Existing Structure Scheduled for Removal
- R391 Existing Structure to Remain In-Place



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WESTON SOLUTIONS

Westcliffe Engineers, Inc.

Parker Flats MRA Phase II Building Location Map Northeastern Portion

FORA ESCA RP
Monterey County, California

Figure C-4

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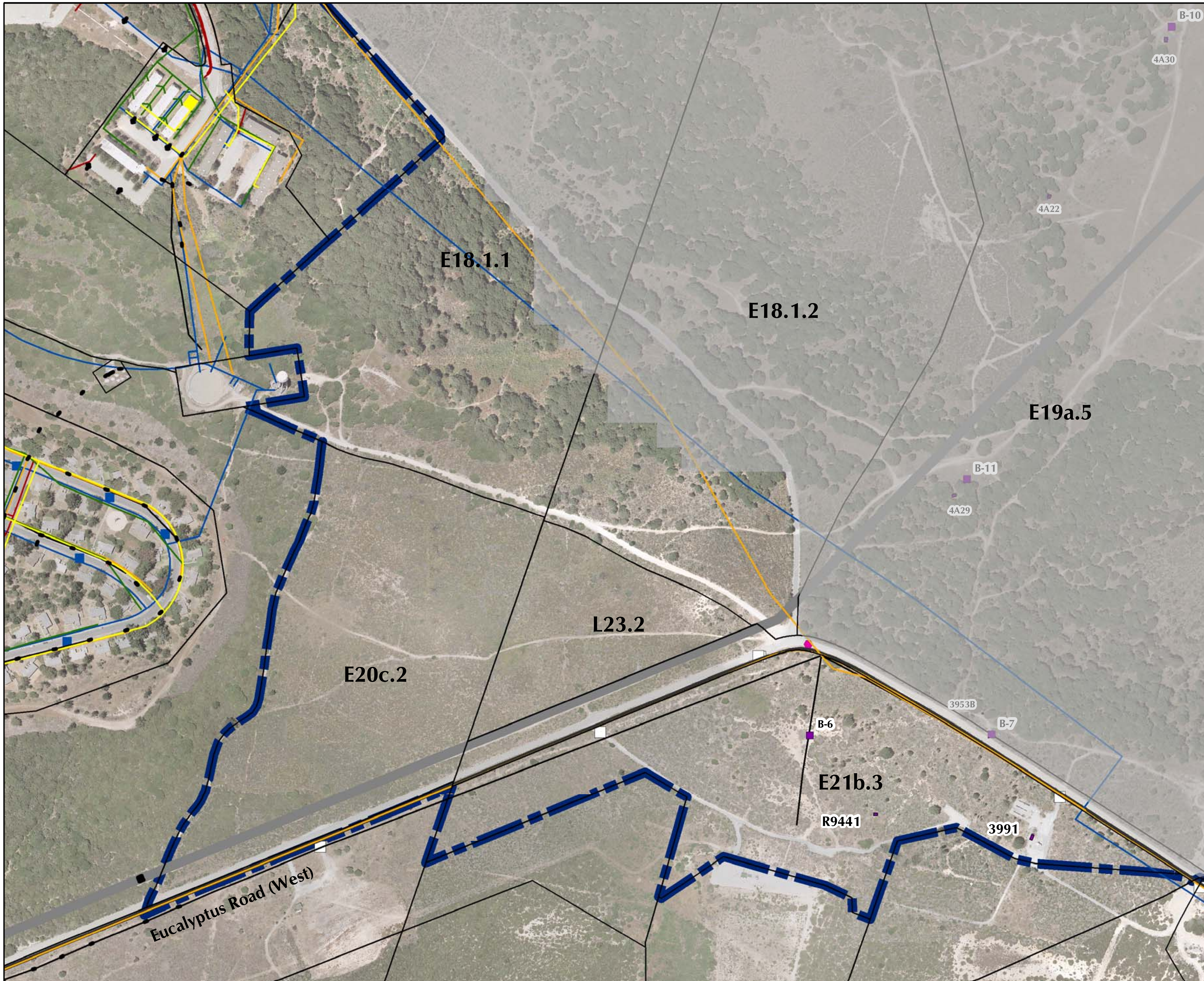
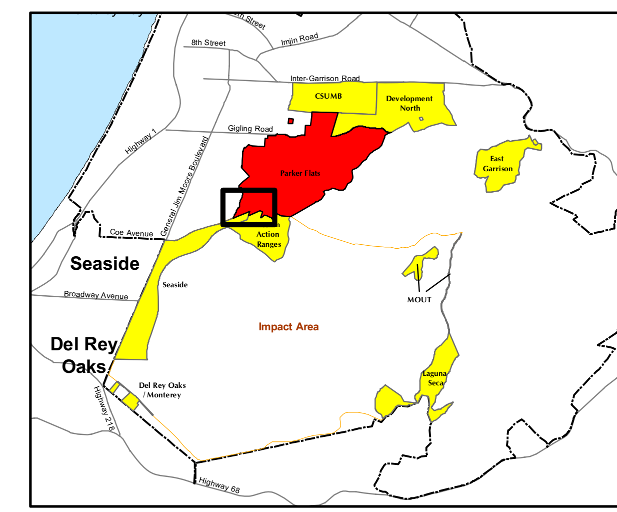


Legend

- Gate
- Sign
- Hydrant
- Electrical Line Pole
- Major Road
- Gas Line
- Sewer Line
- Storm Line
- Telephone Line
- Water Line
- Electrical Line
- High-Power Transmission Line and Right of Way
- E19a.1 USACE Parcel
- Phase I Remedial Investigation Area
- Parker Flats MRA

Building Description

- 4386 Existing Structure Scheduled for Removal
- 3991 Existing Structure to Remain In-Place



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WESTON SOLUTIONS

Westcliffe Engineers, Inc.

Parker Flats MRA Phase II Building Location Map Southwestern Portion

FORA ESCA RP
Monterey County, California

Figure C-5

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APPENDIX D

Standard Operating Procedures

STANDARD OPERATING PROCEDURE FOR CHIPPING OPERATIONS

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to provide the minimum procedures and safety and health requirements applicable to the conduct of chipping operations in areas that are considered environmentally sensitive.

2.0 SCOPE

This SOP applies to all personnel involved in the conduct of chipping operations either using a disk-type or rotary-drum-type chipper.

3.0 REGULATORY REFERENCES

- Weston Corporate Safety and Health Program (FLD47)
- OSHA General Industry Standards, 29 CFR 1910
- OSHA Construction Standards, 29 CFR 1926
- USACE EM 385-1-1, Safety and Health Requirements Manual
- AR 385-10, Army Safety Program
- Operators Manual and Manufacturers Recommendations

4.0 RESPONSIBILITIES

4.1 Remediation Project Manager (RPM)

The RPM is responsible for ensuring availability of resources required to safely implement this SOP.

4.2 Senior Unexploded Ordnance Supervisor (SUXOS)

The SUXOS is responsible for incorporating this SOP in plans, procedures, and training.

4.3 UXO Safety Officer (UXOSO)

The UXOSO ensures that all chipping operations are being conducted in a safe manner, in accordance with the appropriate work plans, FLD 47, and this SOP.

4.4 Chipper Team Leader

The chipper team leader is responsible for the daily maintenance, upkeep, and repair of the machine, and certification of operator personnel.

4.5 Qualified Biologist

The Qualified Biologist will identify locations where mulch is not to be spread, to avoid affecting the re-establishment of Habitat Management Plan annual plants.

5.0 CHIPPING OPERATIONS

5.1 General

Chipping is required whenever vegetation removal is being conducted in the Habitat Management Area. In addition, it may be necessary to conduct chipping to improve ground visibility and safety.

5.2 Chipper Operation

The chipper will be manned by brush feeders (laborers). When feeding material into the chipper, feeders must exercise care not to place hands, or any other parts of the body, or loose clothing on the feed table when the chipper is in operation. Care will be taken not to reach past the "SAFE" point established on the feed table/chute. This point varies between chipping machines and will be identified to all personnel.

- A push stick of material consumable by the chipper will be available, one on either side of the chipper, for pushing material into the chipper when it is necessary to probe beyond the safe point.
- Brush draggers will be employed to drag brush to the feeders. The draggers will trim the brush as necessary to fit it into the chipper, and pass it to the feeders.
- Limbs and wood stock 3 inches or greater in diameter need not be chipped. These items can be left in the field as a source of habitat for bugs, salamanders, and other creatures.
- The chipper team leader must oversee the operation with regard to safety, work progress, weather/wind conditions, materials being chipped, and other factors that affect the operation.
- Poison oak will not be chipped by itself. If it is entangled within brush, it will be chipped based on the team leaders' discretion.
- Any time the chipper is operated while disconnected from the team vehicle, the chipper's wheels will be blocked or chocked to prevent it from rolling.
- Fluid levels and gauges will be checked periodically and at every break.

5.3 Chipped Mulch

Mulch will, in most locations, be spread over the area from which the original brush material was cut and be limited to 3 inches in depth. Mulch will not be spread any closer than 5 feet from the roadsides whenever possible. Mulch will not be spread in certain locations where sensitive annual plant habitat occurs, as identified by the Qualified Biologist.

5.4 Field Sanitation

The team decontamination station will be located at least 50 feet upwind of the chipping operation. If the team vehicle is attached to the chipper, the team equipment in the pickup bed will be covered with a tarp or plastic sheet material.

5.5 Hearing Conservation

The first day, the noise level will be measured using an appropriate measuring device(s). Readings will be taken at the machine, as well as in the vicinity of the machine, and noise attenuation devices selected and issued. Directives of FLD 01 will be adhered to at all times.

6.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Modified Level D PPE will be required for personnel engaged in chipping operations to include:

- Coveralls – appropriately taped at ankles and openings
- Surgical/inner gloves
- Leather or canvas work/outer gloves
- Leather gauntlets
- Work boots – leather or suitable material
- Tyvek hood when in poison oak
- Hard hats
- Hearing protection −brush feeders will wear noise attenuating helmets or ear plugs, both will be worn if uninterrupted work period extends beyond 45 minutes
- Brush draggers will wear noise attenuating helmets or ear plugs
- Eye protection −all personnel will wear safety glasses, brush feeders will also wear face shields/screens
- Disposable dust masks - at any time that dust is being generated, disposable dust masks will be worn

No one will approach within 35 feet of an operating chipper without the appropriate PPE and hearing protection.

7.0 TRAINING

All personnel who work on a chipping crew will be qualified and certified through machine-specific, site-specific, and on-the-job training. This training will consist of:

- Mechanical operations and maintenance of the chipper
- Features of the chipper and its operational limits and characteristics
- Safety parameters relevant to chipping operations

STANDARD OPERATING PROCEDURE FOR MECHANICAL VEGETATION CUTTING

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) together with FLD 47 is to provide the minimum procedures and safety and health requirements applicable to the conduct of mechanical vegetation cutting operations.

2.0 SCOPE

All personnel performing operations utilizing mechanical equipment for vegetation cutting will conform to this SOP. This SOP is not a stand-alone document, and all personnel will become familiar with associated documents and/or manuals related to this operation.

3.0 REGULATORY REFERENCES

- Weston Solutions, Inc., Corporate Safety and Health Program
- OSHA General Industry Standards, 29 CFR 1910
- OSHA Construction Standards, 29 CFR 1926
- USACE EM 385-1-1, Safety and Health Requirements Manual
- AR 385-10, Army Safety Program
- Operator’s Manual and Manufacturer’s Recommendations

4.0 RESPONSIBILITIES

4.1 Remediation Project Manager (RPM)

The RPM is responsible for ensuring availability of resources required to safely implement this SOP.

4.2 Senior Unexploded Ordnance Supervisor (SUXOS)

The SUXOS is responsible for incorporating this SOP in plans, procedures, and training.

4.3 UXO Safety Officer (UXOSO)

The UXOSO ensures that all mechanical vegetation cutting operations are being conducted in a safe manner in accordance with the work plan and this SOP.

4.4 Mechanical Vegetation Cutting Team Leader

The team leader is responsible for the daily maintenance, upkeep, and repair of the machine and certification of operator personnel.

4.5 UXO Escort/Ground Safety Observer

The UXO Escort/Ground Safety Observer ensures that personnel and equipment remain within the site, and marks any munitions and explosives of concern (MEC) encountered and reports their location to the SUXOS.

4.6 Team Members

The team members are responsible for the proper and safe operation and maintenance of all equipment, such as weed eaters and chainsaws, and walking behind brush hogs.

5.0 MECHANICAL VEGETATION CUTTING OPERATIONS

Vegetation cutting operations will be consistent with the operator's manual and terrain features, and permits the Ground Safety Observer to perform those duties as directed to include a visual search/survey of the area(s) to be worked in.

- Personnel will not enter within 50 feet of an operating piece of equipment. If, at any time, personnel enter closer than 50 feet, the operator will immediately stop, return the engine to idle speed, and disengage power to all attachments.
- A communications check with the team personnel prior to operations commencing will be conducted. Hand signals are devised and used as a secondary means of communication. All team personnel must know these hand signals prior to operations commencing.
- The direction and manner in which the vegetation is to be removed will be directed by the team leader. Prior to cutting operations commencing, a visual search/survey is conducted to determine the hazards that may be encountered, including MEC, terrain slope, vegetation, wildlife, and environmental concerns. The team leader will also determine the personal protective equipment (PPE) requirements based on the identified hazards.
- The Ground Safety Observer precedes the equipment and performs a visual search for MEC, ordnance scrap, rats' nests, surface debris, and any other obstruction/object that may pose a hazard to team personnel. Hazardous items, impassable terrain, or vegetation that may affect operations will be marked and team personnel notified. The operator shall follow a route selected by the Ground Safety Observer while operations are ongoing.
- Team personnel will ensure that a 6-inch ground clearance is maintained during cutting operations. Those areas marked as hazards are to be avoided.

- MEC or MEC-related items encountered are marked and avoided. Notification of these items will be made to the SUXOS.

5.1 Safety

Safety is paramount. All personnel will observe those safety precautions/warnings that apply, or may apply, to vegetation cutting operations. Those listed below are general in nature and personnel will need to review applicable publications for more specific safety precautions/warnings. Distances are the minimum required.

- Maintain 200 feet from essential non-UXO personnel; UXO personnel engaged in intrusive work; and other mechanical equipment (e.g., backhoe).
- Maintain 50 feet between equipment and team personnel.
- Distances may be increased by the UXOSO, as determined by site history, MEC items encountered, terrain features, and other factors that may apply.
- Use equipment safety features (e.g., guards).
- Safety precautions/warnings found in the operator's manual(s)/manufacturer's publication(s) will be observed.
- Maintain 6 inches of ground clearance during cutting operations.
- Communications will be maintained between the Team Leader/UXO Escort, operator, and Ground Safety Observer at all times.
- Maintain site control.
- Observe safety precautions for items encountered or suspected.
- Ensure PPE is serviceable and worn/used in a proper manner.

6.0 PERSONAL PROTECTIVE EQUIPMENT

Level D PPE will be required for personnel engaged in mechanical vegetation cutting. Clothing includes, but is not limited to:

- Coveralls or work clothing as prescribed
- Work gloves, leather or canvas as appropriate
- Safety glasses
- Face shields when appropriate
- Hard hats when working within 100 feet of equipment
- Hearing protection, noise attenuators or ear plugs when within 50 feet of equipment
- Dust mask, as required by wind conditions and/or the presence of airborne particulate matter

- Other PPE as needed (e.g., face shield, Kevlar chaps, etc.)

7.0 TRAINING

All personnel who work on a mechanical vegetation cutting crew will be qualified and certified through machine-specific, site-specific, and on-the-job training. This training will consist of:

- Mechanical operations and maintenance of the vegetation cutting equipment
- Features of the equipment and its operational limits and characteristics
- Safety parameters relevant to mechanical operations

STANDARD OPERATING PROCEDURE FOR DEMOLITION AND MEC CLEARANCE OF FIELD LATRINES

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to provide the minimum procedures and safety and health requirements applicable to the conduct of demolition and munitions and explosives of concern (MEC) clearance of field latrines on the former Fort Ord.

2.0 SCOPE

This SOP applies to all personnel involved in the conduct of MEC clearance of field latrines, and the use of earth moving machinery for the operation.

3.0 REGULATORY REFERENCES

- Weston Corporate Safety and Health Program
- OSHA General Industry Standards, 29CFR 1910
- OSHA Construction Standards, 29CFR 1926
- USACE EM 385-1-1, Safety and Health Requirements Manual
- AR 385-10, Army Safety Program

4.0 RESPONSIBILITIES

4.1 Remediation Project Manager (RPM)

The RPM is responsible for ensuring availability of resources required to safely implement this SOP.

4.2 Senior Unexploded Ordnance Supervisor (SUXOS)

The SUXOS is responsible for incorporating this SOP in plans, procedures, and training and ensuring that all personnel conducting field latrine demolition operations are familiar with and comply with this SOP.

4.3 UXO Safety Officer (UXOSO)

The UXOSO ensures that all operations pertaining to field latrines are being conducted in a safe manner and in accordance with the appropriate work plans and this SOP. The UXOSO conducts safety audits of the operations and ensures that all personnel are properly trained and utilizing the appropriate personal protection equipment (PPE).

4.4 UXO Team Leader

The UXO Team Leader is responsible for supervision of the team conducting the demolition and clearance of the field latrines. The UXO Team Leader is required to conduct training of personnel involved in field latrine operations to ensure that equipment operators and line tenders thoroughly understand this SOP.

5.0 OPERATIONS

5.1 General

- Visual clearance of field latrines is required prior to backfilling.
- The backhoe or similar machine will be used to push or pull the structure from the pit. Accessibility and structure design will dictate which method to employ. This operation will involve an equipment operator and a UXO Supervisor, who is acting as a safety observer.
- A minimum of three UXO Technicians will perform the search operation: One UXO Team Leader, and two UXO Tech I/IIs. One UXO Tech I/II will conduct the search, while the other one tends the safety line.

The worker conducting the inspection will don Level C PPE consisting of:

- Tyvek coveralls with hood
- Rubber boots, rubber gloves with inner cotton gloves
- Full face respirator with high-efficiency particulate (HEPA) filters
- Safety harness

The technician will visually inspect for anomalies from the edge of the latrine opening. The contents will be moved around with a long-handled rake or hoe-matic to ensure that the pit is clear of MEC.

In the event MEC is encountered, and it is determined to be safe to move, it will be decontaminated using a 50/50 bleach/water mixture, placed in a plastic bag, and transported to the safe holding area. In the event the item is deemed unsafe to move, the UXOSO will be notified for guidance.

Upon approval from the UXO Quality Control Specialist and the UXOSO, the pit will be backfilled. The structure will be disposed of in accordance with the appropriate work plans.

6.0 SAFETY

6.1 General

- Pits required to be left open and unattended will be clearly marked with caution tape or orange safety fence.
- At no time will any personnel enter the concrete septic pit.
- One end of the safety line will be attached to the harness; if no other solid anchor is available, the other end will be attached to the backhoe or team vehicle. The UXO Team Leader will collect and control keys for that vehicle.

6.2 PPE

- Personnel around the backhoe will wear hard hats.
- Level C PPE will consist of: full-face respirator with HEPA filters (N/P/R 99,100), Tyvek coveralls with hood, rubber boots, and rubber gloves.
- The line tender will wear Level C PPE with the respirator readily available.

6.3 Personnel Decontamination Station (PDS)

- The PDS will be set up prior to starting the operation in an upwind location.
- Personnel will be decontaminated using a 10% bleach/water solution.
- The minimum equipment required for the PDS is:
  - Plastic tarp
  - Large trash bag or receptacle
  - Deck sprayer for 10% bleach solution

STANDARD OPERATING PROCEDURE FOR HANTAVIRUS EXPOSURE PROTECTION

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) along with FLD 43 is to provide the minimum procedures and safety and health requirements applicable to the conduct of operations involving potential exposure to Hantavirus.

2.0 SCOPE

To establish a policy to protect personnel engaged in activities at the former Fort Ord from potential exposure to Muerto Canyon Virus (MCV). Hantavirus Pulmonary Syndrome (HPS) is a respiratory disease, which is caused by a type of Hantavirus. The particular Hantavirus responsible for HPS is the MCV.

3.0 BACKGROUND

There have been confirmed cases of fatal Hantavirus infection in California in recent years. As a result, this SOP has been developed to provide guidance to personnel whose occupational activities might expose them to sources of this virus.

4.0 METHOD OF TRANSMISSION

MCV is transmitted to humans through the inhalation of aerosolized excreta (feces, urine, and saliva) and contaminated dust from rodents and their nests. This includes rats, deer mice, brush mice, and western chipmunks. Some sites where personnel will be working are infested with significant numbers of rat nests that may be encountered during the conduct of activities.

5.0 SYMPTOMS OF MCV

Workers infected with MCV develop febrile or respiratory illness within 45 days of their exposure. The initial symptoms are flu-like and may progress to life-threatening respiratory distress. Besides supportive measures, there are no proven therapeutic agents available at this time for MCV. Workers showing symptoms should seek medical attention immediately. The physician should be informed that MCV is a potential occupational risk and a blood sample should be drawn for comparison with the baseline serum sample. The blood samples should be forwarded to the California State Department of Health for transfer to the Center of Disease Control for testing. The required storage for drawn serum of -20° C may be impractical for extended periods in many locations. The serum will aid in diagnosis by clarifying baseline status, but it is not essential.

5.1 Medical Program

All employees working at the former Fort Ord have baseline blood serum samples drawn during the conduct of their pre-employment physical. The examination also includes a medical and occupational history review, blood and urine tests for contaminants of interest, electrocardiogram, pulmonary function tests, chest x-ray, and general physical examination including hearing and vision.

6.0 SPECIALIZED TRAINING

Specialized training regarding MCV is conducted during site-specific training for personnel who will be employed at the site. It includes use of protective equipment, safe and effective use and application of functional tools and equipment, work procedures and practices, medical surveillance requirements, recognition of symptoms and signs of exposure, physical nature of possible sources of exposure, and appropriate first aid.

7.0 EXPOSURE PREVENTION

The following procedures will be used to minimize exposure to MCV.

7.1 Indoor Work Areas

It is not anticipated that employees will be working in "indoor work areas" where there is a potential for exposure to MCV. If this should occur, or if additional buildings or housing to support operations are acquired that have been closed up or vacant for long periods of time, the following procedures will apply:

- Open building and air it out for at least 30 minutes prior to cleanup
- Spray the indoor area with a household disinfectant
- Wait 30 minutes prior to completion of cleanup

7.2 Field Latrines

The Army field latrines located throughout the former Fort Ord are considered to be contaminated with MCV. These latrines will be entered only as necessary to determine if munitions and explosives of concern (MEC) are located within the structure prior to demolition and removal. Field toilet facilities will consist of port-a-johns, strategically located within the work sites.

7.3 Outdoor Work Areas

Rat nests exist in varying numbers throughout the installation. It is expected that these are the prime threat of exposure for employees. When encountered during the course of brush clearing activities, the rat nests are cordoned off with engineer's tape and avoided. During brush clearing in close proximity to the nests, care is exercised to avoid disturbing the nests or creating dust clouds from them. The presence of these nests is recorded on grid sheets by the team leaders. During the conduct of geophysical and MEC activities, cordoned-off rat nests are avoided and the engineer's tape left in place.

7.4 Excavation Team Operations

After all brush cutting and geophysical and MEC activities in the grid are complete, the unexploded ordnance (UXO) excavation team disinfects, searches, and clears the areas beneath the nests.

7.5 Decontamination Method

MCV is easily killed in the environment with common disinfectant solutions such as household bleach/water solution (50/50 for Equipment and Nests, 10% for Personnel) or rubbing alcohol. These solutions and direct sunlight will kill the virus in less than 1 hour.

7.5.1 Decontamination Equipment

The below-listed equipment may be used for nest decontamination and destruction:

- Backhoe
- Backpack fire pumps
- 5-gallon water containers, buckets, and brushes
- Plastic storage and disposal bags
- Drop cloth
- Bleach/water and alcohol
- Rakes and pitchforks
- Other search and clearance equipment normally carried by teams

8.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Level C is the PPE required for personnel engaged in activities where a possibility of exposure to MCV exists. The UXO Safety Officer, in conjunction with the certified industrial hygienist, will make any applicable changes. Level C items include:

- Half-face, air-purifying respirator with high-efficiency particulate (HEPA) filter cartridges (N/P/R 99,100) and non-vented goggles or high-filtration dust mask with non-vented goggles
- Coveralls with hood (disposable if possible); rubber or plastic gloves; rubber boots or disposable shoe covers
- Wrist and ankles will be sealed with tape
- Hard hats will be worn in vicinity of earth moving equipment (backhoe)

Prior to donning a mask/respirator, the wearer must be clean-shaven in the areas of the face that help to create an air-tight seal between the face and the mask/respirator.

9.0 PROCEDURES FOR CLEARING RODENT NESTING AREAS

The below-listed procedures are used by the excavation team when disinfecting, searching, and clearing nests:

- All members of the team dress in prescribed PPE listed in Section 8.0.
- If the backhoe is to be used, the operator positions the backhoe in such a manner as to access nest(s) from the upwind side.
- The nest is drenched with bleach/water solution.
- Nest materials are swept clear of the next location with the backhoe or the rakes and pitchforks, with care being taken not to spread the materials over too large an area.
- The nest is checked with a magnetometer. If no anomalies are detected, the team continues to the next area; if an anomaly is detected, the team proceeds to the next step.
- Contacts are excavated as necessary, leaving materials dislodged.
- Spray again with bleach/water solution. Drench all materials and original nest site.

Be Prepared for Rodents or Snakes to Flee the Nest as Activities Progress.

The decision to use the backhoe or rakes and hand tools to clear nests is at the team leader's discretion, based on consideration for:

- Access to the nests with the backhoe
- Nest size, quantity, and location
- Environmental affect likely to be incurred through maneuvering the backhoe in and out of position (i.e., tire ruts, impressions, and outrigger disturbance of topsoils)

10.0 FIELD SANITATION

Upon completion of work in a potential MCV contamination area, team personnel process themselves through the team field sanitation station. Waste materials are placed in plastic bags with disinfectant solution that will completely wet the item disposed of. The plastic bag is then placed in trash receptacles for disposal as ordinary waste. Non-waste materials (coveralls, gloves, etc.) are placed in plastic bags with disinfectant solution, which will completely wet the items. Upon return to the support compound, the items are then processed for ordinary laundering.

11.0 RESPIRATOR FIT TESTING, INSPECTION, AND MAINTENANCE

Employees required to wear a respirator must be fitted properly and tested for a face seal prior to use of the respirator in a contaminated area. Manufacturers provide fitting instructions and use limitations on their product packaging. The following points should be considered for respirator inspection and maintenance:

- The wearer of a respirator will inspect it prior to its use.
- Supervisory personnel will periodically spot check respirators for fit and condition.
- Respirators not discarded after use will be cleaned after use, according to the manufacturer’s instructions, by the user.
- Respirators not discarded after one use will be stored in a suitable container away from areas of contamination.
- Inspection and maintenance of respirators will be documented in the team leader’s notebook.

STANDARD OPERATING PROCEDURE FOR BACKHOE/EXCAVATOR OPERATIONS

1.0 BACKGROUND

Backhoes/excavators are used at the former Fort Ord to excavate during investigation of subsurface magnetic anomalies, during clearing of rodent nests, and for minor road repair to facilitate site access and egress.

2.0 SCOPE

This standard operating procedure (SOP) contains information specific to the former Fort Ord. It is incumbent upon all designated operators to familiarize themselves with this SOP and Weston Solutions, Inc. (WESTON) FLD 22, and to periodically review them in an effort to remain current with safe, productive backhoe/excavator procedures.

3.0 OPERATIONS

Employees who operate backhoes on the former Fort Ord will be qualified through on-the-job training (OJT) consisting of equivalent OJT that was documented through previous employment or experience, or documented through formal training. When engaged in backhoe/excavator operations the operator will perform daily inspection and maintenance functions and operate the backhoe as directed. Inspections will be documented using the WESTON Equipment Inspection Form or forms from the Operation’s Manual. The operator will also conduct OJT for other operators at the team leader’s discretion.

3.1 Personal Protective Equipment (PPE)

Modified Level D PPE will be required for personnel engaged in backhoe operations. Clothing items will be:

- Coveralls or work clothing as prescribed
- Work gloves, leather or canvas, as appropriate
- Safety glasses - as wind conditions and airborne particulate matter dictate
- Hard hats
- Work boots (sturdy and of sufficient height to aid in ankle support)
- Hearing protection: noise attenuating helmet or earplugs will be worn by anyone within 25 feet of the backhoe while it is operating; FLD 01 will be followed and hearing protection for any other backhoe brought on site will be determined through a noise survey (sound-level meter survey)

- Dust masks - as wind conditions and airborne particulate matter dictate

NOTE: *If the backhoe is being used for the clearance of rat nests to facilitate a magnetometer sweep, PPE will be in accordance with the Hantavirus SOP.*

3.2 General Safety Precautions

Maintain minimum separation distances as identified in the appropriate work plans.

The backhoe/excavator will not be operated without a spotter. This includes using the front and rear attachments and backing the tractor. Prior to starting an excavation, a safety arc will be etched in the ground with the rear boom fully extended. If operating on a hard surface, the safety arc will be marked with bright spray paint. Prior to anyone entering the safety arc, the operators will:

- Swing the boom arm fully to one side
- Lower the bucket to the ground
- Return the engine to idle speed
- Hold her/his hands clear of the controls or in the "hands up" position

3.2.1 Equipment Safety Precautions

See the operator’s manual.

3.3 Team Composition

One unexploded ordnance (UXO) Technician will serve as a safety observer and director for other team personnel and all members of the backhoe team will be UXO qualified. The minimum team makeup will be:

- One operator
- One ground person

3.3.1 Ground Personnel

Team members working on a backhoe/excavator team will be qualified through OJT and will perform such tasks as magnetometer checks, manual excavation, and checks of the hole.

3.4 Training

Training will be documented in UXO Supervisors’ field notebooks and in LFR\WESTON on-site records.

3.5 General Operational Procedures

The operator will have a radio in place so s/he can monitor radio transmissions while driving the backhoe to and from excavation sites. Prior to shutting off the tractor engine the operator should let the engine run at idle speed for a few minutes to allow the turbo charger to cool. Prior to excavation operations the UXO Team Leader will establish/review hand signals with all members of the team. The backhoe will not be used to excavate closer than 12 inches from MEC in accordance with EP-385-1-95A, Section 14, Paragraph b. Removed dirt will be placed at least 2 feet from the expected edge of the excavation, and on the uphill side when working on a slope. Excavations will not be deeper than 4 feet without authorization from the UXO Safety Officer. Such excavations require a competent person as defined by 29 CFR 1926.651-653 to determine step/slope requirements.

STANDARD OPERATING PROCEDURE FOR MEC WITH UNKNOWN FILLER

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to provide the step-by-step procedures and safety and health requirements applicable in the event ordnance items are discovered and the filler cannot be positively determined at the former Fort Ord.

A Chemical Warfare Material (CWM) Risk Assessment has been completed for the former Fort Ord. The results indicated that the probability of encountering CWM munitions is “unlikely” while the probability of encountering CWM Chemical Identification Sets is “seldom.”

2.0 SCOPE

This SOP applies to all personnel involved in the conduct of munitions and explosives of concern (MEC) clearance on the former Fort Ord.

3.0 REGULATORY REFERENCES

- AR 385-61, AR 385-64, DA Pam 385-61, and DA Pam 385-64 for safety concerning Recovered Chemical Warfare Material (RCWM) containing explosives
- AR 50-6, Chemical Surety
- AR 190-11 Security for RCWM
- EP 75-1-3 RCWM Response Process

4.0 RESPONSIBILITIES

4.1 Remediation Project Manager (RPM)

The RPM is responsible for ensuring availability of resources required to safely implement this SOP.

4.2 Senior Unexploded Ordnance Supervisor (SUXOS)

The SUXOS is responsible for incorporating this SOP in plans, procedures, and training and ensuring that all personnel conducting MEC operations are familiar with and comply with this SOP.

4.3 UXO Safety Officer (UXOSO)

The UXOSO ensures that all operations pertaining to MEC clearance are being conducted in a safe manner and in accordance with the appropriate work plans and this SOP. The UXOSO conducts safety audits of the operations and ensures that all personnel are properly trained and utilizing the appropriate personal protective equipment (PPE).

4.4 UXO Team Leader

The UXO Team Leader is responsible for supervision of the team conducting the clearance operation. The UXO Team Leader is required to conduct training of personnel involved in MEC operations to ensure that every member of the MEC team thoroughly understands this SOP.

5.0 OPERATIONS

5.1 General

There are three ordnance items of concern that require positive identification of the filler prior to any disposition, the Livens Projector, the 4-inch Stokes mortar, and the 4.2-inch mortar.

- Visual recognition of the Livens Projector, 4.2-inch mortar, and the 4-inch Stokes is necessary and requires training on recognition features to ensure everyone uses the same techniques. The 4-inch Stokes mortar of concern is 19.56 (19/16) inches in length, measured from the end of the tail boom to the top of the threaded fuze well. 4-inch Stokes mortars of lesser lengths contain known fillers and will be treated as any other MEC item.
- All Livens Projectors and all 4.2-inch mortars are common in dimensions and have different fillers. These ordnance items along with the 19.56-inch-long, 4-inch Stokes will be treated as MEC with unknown fillers.
- Upon recognition/identification of a Livens Projector, a 4.2-inch mortar, or a 4-inch Stokes by any UXO team member conducting a MEC clearance operation, the team member will immediately notify the Team Leader who will measure the item. If the measurements indicate a possible CWM-filled Stokes, or if the item recognized/identified is a 4.2-inch mortar or a Livens Projector, the Team Leader will notify the SUXOS and the UXOSO.
- The UXO team and any other teams in the area will evacuate the area, proceeding at least 200 feet upwind, and await the UXOSO and the SUXOS.
- Upon arrival of the UXOSO, the UXO Team Leader will accompany her/him to the location of the suspect item.
- In the event the UXOSO and SUXOS determine that the item contains a known filler other than CWM, it shall be disposed of in accordance with the work plan.

- Upon verification by the UXOSO and SUXOS of an MEC item with an unknown filler, the exact location will be recorded using a Global Positioning System unit and backfilled with excavated material. The UXO Team Leader will evacuate to the safe area upwind, and the UXOSO and SUXOS will notify the RPM who will notify the Fort Ord Reuse Authority (FORA) who will notify the Presidio of Monterey Police who will notify the Technical Escort Unit (TEU). Following the property transfer from the Army to FORA, FORA will notify the local law enforcement agency who will notify the local Explosive Ordnance Disposal (EOD) unit assigned to the region. In addition, when FORA notifies the local law enforcement agency, they will also notify the Presidio of Monterey Police Department and the local BRAC Fort Ord Field office.
- In the event TEU or the EOD unit positively identifies the filler as CWM, or the filler remains unknown, TEU or the EOD unit will make the determination for and conduct a safe disposal of the item.
- In the event TEU or the EOD unit positively identifies the filler as non-CWM, they will release the item to WESTON for disposal in accordance with the work plan.

6.0 SAFETY

6.1 General

At no time will a Livens Projector, a 4.2-inch mortar, or a 4-inch Stokes mortar measuring 19.56 inches in length (fuzed or unfuzed) be moved prior to disposition determination by TEU.

6.2 PPE

Standard PPE for field MEC operations will be utilized in accordance with the work plan.

STANDARD OPERATING PROCEDURE FOR MATERIAL OR ACTIVITY NONCONFORMANCES

1.0 PURPOSE

This standard operating procedure (SOP) describes the means for the identification, control, handling, review, and disposition of nonconforming material and activities during all phases of the work at the former Fort Ord to prevent the unintended use or delivery of inadequate materials and/or work products.

2.0 RESPONSIBILITES

Unexploded Ordnance Quality Control (UXOQC) personnel have the responsibility to identify, document, and report material, items, or activities that do not conform to prescribed technical and/or quality requirements during all phases of the project.

2.1 Remediation Project Manager (RPM)

The RPM has overall responsibility for implementing this procedure and for ensuring the availability of the resources needed to implement this SOP, and will also ensure that this SOP is incorporated in plans, procedures, and training for sites where this SOP is to be implemented.

2.2 Senior UXO Supervisor (SUXOS)

The SUXOS will be responsible on behalf of the RPM for receipt of all nonconformance reports (NCRs) and the determination of their disposition to correct the nonconforming condition accordingly.

2.3 UXO Quality Control Specialist (UXOQCS)

The UXOQCS will be responsible on behalf of the RPM for ensuring this SOP is effectively implemented.

3.0 PROCEDURES

UXOQC personnel will document nonconforming materials, items, or activities in an NCR. Instructions for completing an NCR are provided with the form. A hard copy or an electronic version may be used. The initiator shall fill out the description and apparent cause of the nonconforming condition. The UXOQCS will review, validate, denote severity level (Attachment 1), assign the corrective action due date, and sign the NCR. The UXOQCS will establish and maintain a log of NCRs issued and track the progress of each NCR using the NCR log (Attachment 2).

3.1 Nonconformance Condition/Release

After the NCR is received and validated by the SUXOS, a nonconforming condition may be conditionally released if justified in writing and approved by the RPM or, where applicable, by the customer. Justification of release will be retained on file as a project record.

3.2 NCR Disposition/Review

The SUXOS may designate a competent individual, knowledgeable in the requirements and with access to pertinent information, to provide recommendations for the NCR's disposition as one of the following rework categories to meet the original requirements: re-clear, resurvey, reacquire, reprocess, or other with explanation. The RPM shall also review and concur with the recommended corrective action prior to implementation. Any corrective action is to be completed by the corrective action due date assigned on the NCR form.

For a severity level of 1, root cause analysis and corrective action (see SOP for Corrective and Preventive Action) to prevent recurrence is required.

3.3 NCR Closure

A verifier appointed by the UXOQCS will verify satisfactory completion of actions for disposition of the nonconformance. Reworked items will be re-inspected to demonstrate conformance to the requirements. If UXOQC personnel determine the corrective action completed is insufficient, the UXOQCS will disapprove the corrective action and initiate a new NCR documenting the determining unsatisfactory factors in the closeout comments section. If the corrective action implemented by the SUXOS effectively eliminated the nonconforming condition, the manner in which the corrective action was verified by UXOQC personnel will be documented by UXOQC personnel in the closeout comments section.

ATTACHMENT 1
Severity Level Descriptions

SEVERITY LEVEL	DESCRIPTION
1	A classification assigned to a condition that indicates repeated failures to prescribe or implement requirements properly, whose effect is systemic in nature, and that undermines the ability to ensure and demonstrate confidence in quality or safety.
2	A classification assigned to a condition that indicates a systemic failure to prescribe or implement requirements properly and whose effect undermines the ability to ensure and demonstrate confidence in quality or safety.
3	A classification assigned to a condition that indicates a systemic failure to prescribe or implement requirements properly. Its effect, however, on quality or safety is minimal.
4	A classification assigned to an obviously isolated condition that indicates a failure to prescribe or implement requirements properly and is non-systemic, but could lead to a Severity Level 3 or higher condition.

ATTACHMENT 2
Nonconformance Report (NCR) Log

NCR NUMBER	SITE	GRID NUMBER	SEVERITY LEVEL	DATE INITIATED	CURRENT STATUS	DATE COMPLETED	COMMENTS
TOTAL							
NCRS							
COMPLETE:							
INCOMPLETE:							
% COMPLETE	%						

STANDARD OPERATING PROCEDURE FOR CORRECTIVE AND PREVENTIVE ACTION

1.0 PURPOSE

This standard operating procedure (SOP) describes the method for conducting root cause analyses of severity level 1 nonconformities identified by NCRs and customer complaints, and evaluating the need for action to ensure that the nonconformities do not recur. Descriptions of the severity levels are provided in the SOP for Material and Activity Nonconformances.

The procedure establishes the methodology to conduct trend analyses of nonconformities identified through NCRs for severity levels 2, 3, and 4, corrective actions, quality surveillance reports, and internal audit results, to identify the repetitive nonconformities and determine preventive action to eliminate the cause of potential repetitive nonconformities.

2.0 RESPONSIBILITIES

2.1 Remediation Project Manager (RPM)

The RPM will establish an operations project team to investigate the root cause of a severity level 1 nonconformance and recommend action to prevent the recurrence.

The RPM is responsible for reviewing the results of the root cause analysis and trend analysis, assigning corrective and preventive actions, and monitoring process performance as a part of the RPM's management review.

2.2 Unexploded Ordnance Quality Control Specialist (UXOQCS)

The UXOQCS will provide support to effectively implement this SOP. Additionally, all root cause analyses, trend analyses, and preventive action reports will be reviewed and recommendations will be provided if applicable.

2.3 Senior UXO Supervisor (SUXOS)

The SUXOS will periodically conduct trend analysis of nonconformities from the sources described herein, and report the results to the RPM and UXOQCS.

3.0 PROCEDURES

3.1 Root Cause Analysis

The operations project team appointed by the RPM will determine the root cause of a severity level 1 nonconformance. The root cause determination will depend upon project-specific factors affecting the product development, product conformity, or process performance. The nonconformity may be classified using event and causal factor codes (Attachment 1) following the root cause analysis. The root cause analysis will identify corrective actions to prevent recurrence. The record of the root cause analysis and corrective action taken will be maintained on file with the UXOQCS as a part of the project record.

3.2 Trend Analysis

The operations project team review results from the following sources and perform a trend analysis when sufficient information and data are available to ensure that the analysis is meaningful. Typically, a trend analysis should be conducted once at least every 6 months for projects of 1 year or longer in duration. For short-duration projects, the trend analysis should be done at about the halfway point.

(1) Corrective actions (severity level 1 NCRs, customer complaints)

(2) Internal and external (including customer) audit results, quality surveillance/audit reports

(3) NCRs (severity levels 2, 3, or 4)

3.3 Preventive Action

For the period under review, the project operations team shall determine the root cause(s) of potential repetitive nonconformities and evaluate the need for action to prevent their recurrence. The project operations team will prepare a report identifying the nonconformities for each area of the project processes/procedures, a consolidated summary of root causes of the nonconformities, and a statement of trends that are developing or have developed, and submit the report to the RPM. The RPM will provide appropriate corrective actions to the UXOQCS to prevent recurrence of the adverse trends. The team and the UXOQCS will verify implementation of the preventive actions and report the results to the RPM. The record of trend analysis and preventive action taken will be maintained on file by the UXOQCS as a part of the project record.

ATTACHMENT 1
Event and Causal Factor Codes

EVENT		CASUAL FACTOR	
CODE	DESCRIPTION	CODE	DESCRIPTION
A	Noncompliance with standards, policies, procedures, or other administrative controls	1	Incorrect or inadequate procedures
B	Human error/inattention to detail	2	Insufficient, inadequate, or lack of training
C	Failure to meet contractual requirements	3	Inadequate supervision/management skills or practices

STANDARD OPERATING PROCEDURE FOR UNANTICIPATED CHEMICAL CONTAMINATION CONDITIONS

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to provide the step-by-step procedures applicable in the event that unanticipated chemical contamination conditions are encountered or suspected.

Unanticipated chemical contamination conditions may include, but are not limited to:

- oily, shiny, pigmented, or saturated soil or free product;
- soil a with strong chemical odor;
- discovery of objects or structures of environmental concern such as underground storage tanks and associated piping, buried drums, sumps, etc.;
- discovery of suspected debris of environmental concern such as buried refuse, painted building materials, asbestos-containing pipes, or Transite™;
- other conditions that vary materially from those documented during previous investigations;
- discovery of areas containing a high concentration of spent ammunition; and
- discovery of bulk explosives.

2.0 SCOPE

This SOP applies to all personnel involved in operations that have the potential to disturb or expose soil.

3.0 REFERENCE DOCUMENTS

- Weston Corporate Safety and Health Program (FLD47)
- ESCA RP Waste Management SOP
- 29 CFR 1910.120
- 29 CFR 1926.65
- 22 CCR Division 4.5

4.0 RESPONSIBILITIES

4.1 Remediation Project Manager (RPM)

The RPM is responsible for ensuring that the Fort Ord Reuse Authority (FORA), the United States Department of the Army (Army), and the appropriate regulatory agencies (identified in Table 2 of this SOP) are notified.

4.2 Senior Unexploded Ordnance Supervisor (SUXOS)

The SUXOS is responsible for incorporating this SOP in plans, procedures, and training. The SUXOS will be responsible for providing notification to the Environmental Services Cooperative Agreement Remediation Program (ESCA RP) Team members identified in Table 1 of this SOP.

4.3 UXO Safety Officer (UXOSO)

The UXOSO ensures that all operations are being conducted in a safe manner and in accordance with the appropriate work plan and this SOP. The UXOSO conducts safety audits of the operations and ensures that all personnel are properly trained and utilizing the appropriate personal protective equipment (PPE).

4.4 Field Personnel

Field personnel will be conducting the fieldwork activities. Personnel conducting fieldwork activities are responsible for completing their tasks according to specifications outlined in this SOP and associated work plans. In the event that suspected soil contamination is encountered during fieldwork activities, field personnel must notify the SUXOS immediately.

4.5 Environmental Professional

The environmental professional is a member of the ESCA RP Team who possesses sufficient specific education, training, and experience necessary to exercise professional judgment to develop opinions and reach conclusions regarding conditions indicative of releases or threatened releases of hazardous substances to the soil. The environmental professional will be responsible for determining whether initial screening-level soil samples should be collected and/or notifying the RPM that the Army should be notified immediately, and FORA and the appropriate regulatory agencies should be notified within 24 hours by contacting their representatives listed in Table 2.

5.0 OPERATIONS

If suspected soil contamination is encountered during the fieldwork activities, the following procedures will be followed:

1. All field activities that may potentially disturb the unanticipated chemical contamination will be immediately stopped. Field personnel encountering the unanticipated chemical contamination must immediately notify the SUXOS and move to a safe location to avoid odors or leaking fluids (i.e., upwind or uphill).
2. If there is no immediate danger to personnel, field personnel will create an appropriate exclusion zone with markers and/or barricades around the suspect area to prevent further soil disturbance in this area.
3. If an emergency situation requiring medical attention, containment assistance, or other emergency assistance arises, the emergency procedures specified in the Site Safety and Health Plan will be followed.
4. The SUXOS will immediately notify the ESCA RP Team representatives listed in Table 1.
5. An environmental professional on the ESCA RP Team will be mobilized to visually assess the suspect area. If it is determined by the environmental professional that contamination by chemical compounds is possible (based upon visual observation or the analytical results of initial screening-level sampling), the environmental professional will notify the RPM.

   Examples of suspect contamination include the discovery of:

   - oily, shiny, or saturated soil or free product;
   - significant areas (greater than 3 square feet) of pigmented soil that do not appear to be related to native soil coloring;
   - soil with a strong chemical odor;
   - objects or structures of environmental concern such as underground storage tanks and associated piping, buried drums, sumps, etc.;
   - significant quantities of suspect debris of environmental concern such as asbestos-containing pipes, Transite™, or similar ACM;
   - significant quantities of suspected debris of environmental concern such as treated wood waste, chipping, cracking, or alligatoring paint (indicative of LBP), or electrical components;
   - other conditions that vary materially from those documented during previous investigations;
   - areas of high concentrations of spent ammunition; and
   - bulk explosives.

   Examples of the above are found in Attachment 1.

   The RPM will notify the Army immediately and FORA and the appropriate regulatory agencies within 24 hours by contacting their representatives listed in Table 2. Information provided to the Army will include the location of the discovery (including Global Positioning System [GPS] location) and approximate depth of discovery; the site conditions at the time of discovery; and a description of changes to the site conditions since the discovery.

6. If practicable and if it is safe to leave the area exposed, the suspected contamination will not be disturbed until the Army has determined whether soil samples or remedial activities are necessary. Work should not resume in the affected area until remedial activities have been completed or the suspected chemical contamination is determined to be benign.
7. If the suspected contamination is *not* a U.S. Army-retained condition (for example building debris) the ESCA RP Team may collect samples of the debris for classification purposes as described in the Waste Management SOP.
8. If samples collected by the ESCA RP Team indicate that the building debris may have affected site soils (for example if the material contains lead-based paint and fails the Soluble Threshold Limit Concentration [STLC]), the ESCA RP Team will consult with FORA and regulatory agencies to determine if additional investigation is necessary.
9. If only building materials are affected, the ESCA RP Team will remove the debris until no visible material is present, segregate the debris for disposal, and classify the material for waste disposal as described in the Waste Management SOP.

6.0 PERSONAL PROTECTIVE EQUIPMENT

Appropriate PPE for the particular fieldwork activity will be utilized in accordance with the appropriate work plan. Equipment and clothing coming in contact with the potential contamination will be decontaminated in accordance with the appropriate work plan.

7.0 NOTIFICATIONS AND REPORTING

If unanticipated contamination is encountered or suspected in the field, the persons indicated in Table 1 must be notified immediately.

Table 1
ESCA RP Team Contact List

Contact		Telephone (office/cell)
ESCA RP Team		
Weston:	Linda Temple (ESCA Remediation Project Manager) and	(831) 384-3221 / (831) 229-1668
	Greg Clark (Site Safety Officer)	(831) 384-3221 / (831) 240-1391
LFR:	Christopher Spill (ESCA Technical Project Manager) or	(831) 384-3221 / (510) 387-3765
	Wendy Devaney (ESCA Remediation Project Engineer) and	(510) 596-9608 / (510) 590-7317
	Kristie Reimer (ESCA Remediation Program Manager)	(831) 384-3221 / (650) 224-8545

Notes:
Weston = Weston Solutions, Inc.
LFR = LFR Inc.

If unanticipated contamination is visually confirmed in the field by an ESCA RP Team representative identified in Table 1, the appropriate persons indicated in Table 2 will be notified within 24 hours by an ESCA RP Team representative. The Army representative will be notified immediately.

Table 2
Client and Regulatory Agency Contact List

Contact		Telephone (office/cell)
FORA:	Stan Cook (FORA ESCA Program Manager)	(831) 883-3672
ESCA RP Team		
Weston:	Dwight Gemar (ESCA Remediation Project Engineer)	(707) 562-3352 / (925) 899-4674
LFR:	Chuck Pardini (ESCA Program Quality Manager)	(650) 469-7224 / (510) 813-1053
Army:	Gail Youngblood (Environmental Coordinator)	(831) 242-7918
U.S. EPA:	Judy Huang (Remediation Project Manager)	(415) 972-3681
DTSC:	Roman Racca (Project Manager)	(916) 255-6407
Monterey County Department of Environmental Health, if needed		(831) 755-4500
Other agencies as applicable, e.g., National Response Center		(800) 424-8802

Notes:
U.S. EPA = United Stated Environmental Protection Agency
DTSC = Department of Toxic Substances Control

If unanticipated contamination is encountered, the ESCA RP Team will document it in a report that is submitted to the regulatory agencies within 30 days after the discovery of the unanticipated contamination. This report will include the following:

- brief description of the nature of suspected contamination and how it was discovered;
- verification of notification of personnel listed in Table 2;
- description/verification that the procedures outlined in this SOP were followed to alert the Army of the presence of a retained condition (if applicable); and
- characterization (including stockpile and confirmation sampling) data collected.

Photograph #1

Description of Photograph:

Example of product on equipment in trash pile.

Photograph #2

Description of Photograph:

Example of significantly stained oily soil.

Photograph #3

<u>Description of Photograph</u>:

View of pigmented soil.

Photograph #4

<u>Description of Photograph</u>:

Example of unanticipated buried tank.

Photograph #5

<u>Description of Photograph</u>:

Example of partially buried and damaged drum.

Photograph #6

<u>Description of Photograph</u>:

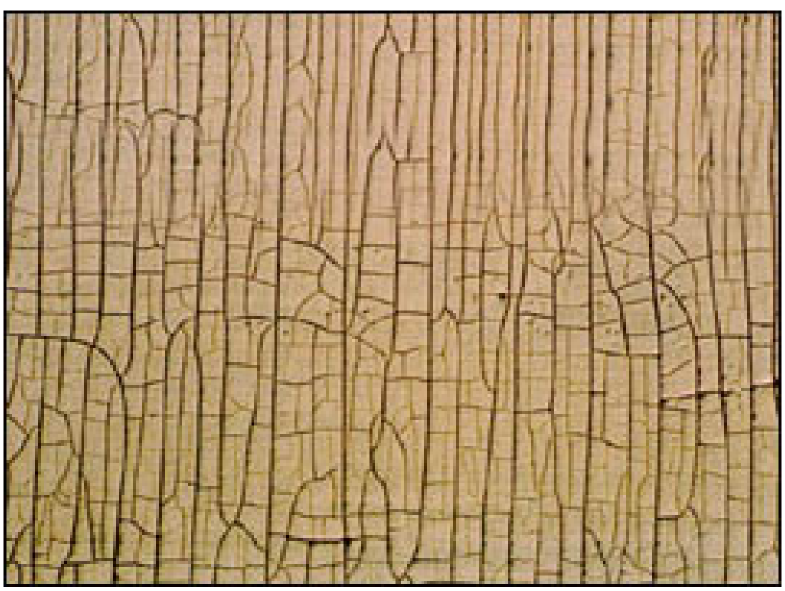
Example of Transite™ pipe.

Photograph #7

Description of Photograph:

Example of asbestos-containing pipe wrap on water main.

Photograph Taken By:
Michael Doherty



Photograph #8

Description of Photograph:

Example of alligatoring LBP.

Photograph #9

<u>Description of Photograph</u>:

Example of cracking LBP.

Photograph #10

<u>Description of Photograph</u>:

Exampling of severely chipping LBP.

STANDARD OPERATING PROCEDURE FOR MANAGEMENT AND CHARACTERIZATION OF WASTE STREAMS FROM FIELD ACTIVITIES

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to provide the step-by-step procedures for identifying waste streams generated from field activities and to provide guidance for the characterization and proper disposition of these waste streams.

For the purposes of this SOP "waste streams" have been defined as any material that was generated by field activities that will not be reused onsite. For the purposes of this report waste streams do not include environmental conditions retained by the U.S. Army such as potentially contaminated soil. If these materials are uncovered field personnel should refer to the soil management plan and the SOP for Unanticipated Chemical Contamination Conditions. For the purposes of this report waste streams do include recyclable materials. The Fort Ord Reuse Authority (FORA) Environmental Services Cooperative Agreement (ESCA) Remediation Project (RP) Team has identified the following potential waste streams at the Site which would be covered by this SOP:

- Painted construction debris;
- Lead affected soil, rock or fines;
- Lead-based paint chips;
- Friable asbestos-containing material;
- Non-friable asbestos-containing material;
- Treated wood;
- Unpainted construction debris not planned for recycling;
- Unpainted concrete-recyclable;
- Metal-recyclable;
- Asphalt-recyclable;
- White goods;
- Universal Waste-Florescent Bulbs;
- Universal Waste- Mercury switches, thermometers and gauges;
- Universal Waste-Batteries;
- Light Ballasts;
- Lubricating fluids;
- Vehicles and related debris (non tire);
- Tires-recyclable;
- Wood and vegetative mulch;

- Personal protective equipment (PPE) and field consumables;
- Decontamination water;
- Residual fluids in latrine pits; and
- Munitions debris.

Additionally, the ESCA RP Team understands that the reuse or recycling of some materials (specifically; asphalt road base, vegetative mulch, soil and/or gravel) may not be practicable due to concerns of residual constituents remaining within these materials. With consolation with the regulatory agencies the RP Team may choose to classify these materials as munitions debris (MD).

2.0 SCOPE

This SOP applies to all personnel involved in the characterization, manifesting, and disposition of waste stream materials. This document is intended to aid in planning for and handling waste streams which may be encountered at the Site. Not all waste streams described may be present at the Site.

3.0 REFERENCE DOCUMENTS

- Weston Corporate Safety and Health Program (FLD47)
- American Society for Testing and Materials (ASTM) Standard E1908-03
- 14 CCR Division 7
- 22 CCR Division 4.5
- 27 CCR Division 2
- MBUAPCD Rule 424
- Department of Toxic Substances Control (DTSC) "Information Advisory - Clean Imported Fill Material" Dated October 2001
- 29 CFR 1910.120
- 29 CFR 1926.65
- 40 CFR 61
- 40 CFR 260 to 279
- 40 CFR 761
- 49 CFR 171 to 173, 179

4.0 RESPONSIBILITIES

4.1 Remediation Project Manager (RPM)

The RPM is responsible for the proper classification, handling and disposition of the waste streams.

4.2 Senior Unexploded Ordnance Supervisor (SUXOS)

The SUXOS is responsible for incorporating this SOP in plans, procedures, and training of field crews. The SUXOS is also responsible for notifying the environmental professional when suspect hazardous waste is encountered or when materials will require classification prior to disposal. The SUXOS will be responsible for certifying that materials leaving the Site are free from explosives using Form 1348.

4.3 UXO Quality Control Specialist (UXOQCS)

The UXOQCS also certifies that materials leaving the Site are FFE on Form 1348.

4.4 Field Personnel – HAZWOPER Trained

Field personnel will be conducting the discovery, handling, segregation, containerization, and related activities associated with the disposition of waste streams. Field personnel are responsible for completing their tasks according to specifications outlined in this protocol and associated work plans. In the event that suspected hazardous waste is encountered during activities, field personnel must notify the SUXOS immediately.

4.5 Environmental Professional

A member of the ESCA RP Team who possesses sufficient specific education, training, or experience necessary to exercise professional judgment to develop opinions and conclusions regarding the classification and condition of Site waste streams. The environmental professional will be responsible for determining whether sufficient data exists to accurately classify and characterize materials into appropriate waste streams for disposition.

4.6 Generator

The generator is the owner or operator of the waste stream and is ultimately responsible for properly characterizing and handling the waste streams generated at the Site.

The hazardous waste generator for the ESCA RP Team **prior** to the transfer of property to the Fort Ord Reuse Authority is:

The Ord Military Community
US Army DLIFLC – Presidio of Monterey
P.O. Box 5005
Monterey, California 93944
(831) 242-7933
Contact: Richard Schmitt

Mr. Schmitt should be notified at least 1 week prior to planned shipment of manifested waste to ensure that material disposal is authorized by and are properly characterized, logged, and manifested by the Army. Mr. Schmitt, or his authorized signatory, are the only designated Army contacts authorized to sign manifests and associated profiles, land disposal restrictions or similar waste documents on the behalf of U.S. Army.

The hazardous waste generator for the project team **after** the transfer of property to the Fort Ord Reuse Authority is:

The Fort Ord Reuse Authority
100 12th Street, Building 2880
Marina, California 93933
(831) 883-3672
Contact: Stan Cook

Mr. Cook should be notified at least 1 week prior to planned shipment of manifested waste to ensure that material disposal is authorized by and are properly characterized, logged, and manifested by FORA. Mr. Cook, or his authorized signatory, are the only designated contacts authorized to sign manifests and associated profiles, land disposal restrictions or similar waste documents on the behalf of FORA.

4.6.1 Generator Training Requirements

As required signatories responsible for filling out hazardous waste manifests should have an appropriate level of training necessary to understand classification, handling manifesting and disposal of the generated waste streams.

5.0 OPERATIONS

As described in Section 1, the ESCA RP Team has identified 23 possible waste streams that may be developed in the course of munitions cleanup operations at the portions of the former Fort Ord covered by the ESCA RP. The intent of this SOP is to ensure that potentially hazardous waste streams are identified, segregated, properly classified and handled in the course of field activities. Each waste stream released from the Site will have documentation showing that the material was characterized, shown to be free from explosives, and detailing the material's final disposition. A minimum of three individuals (the SUXOS, UXOQCS, and Environmental Professional) will investigate each waste stream to verify that either it is free from explosives or that the waste stream is either non-hazardous or is properly classified and manifested for off-Site disposal.

The ESCA RP Team understands that some materials that are generally considered non-hazardous or recyclable (Specifically - asphalt road base, vegetative mulch, soil and gravel) may have been affected by constituents which would disallow the reuse of the material off-Site. The ESCA RP Team will therefore seek regulator approval prior to the transport or disposition of the materials off-Site. Alternately these materials may be classified as munitions debris in the event of off-Site disposal.

A description of the process of classifying the environmental disposition of each of the 23 identified potential waste streams is found below. Please note that every waste stream may not be generated by field activities at the Site.

5.1 Painted Construction Debris

Painted building debris will be inspected for lead-based paint or will be assumed to contain lead unless determined otherwise by sampling and analytical testing. Building debris containing lead will be segregated and loose and flaking lead-based paint will be removed and managed as a separate waste stream. The remaining painted building components will be characterized following the procedures set out in ASTM E1908-03 and 22 CCR Div 4.5. Depending on the results of the total threshold limit concentration (TTLC), soluble threshold limit concentration (STLC) and toxicity characteristic leaching procedure (TCLP) tests the materials will be labeled, packaged and manifested for disposal as either a federal hazardous waste, State of California hazardous waste or as non-hazardous waste at an appropriately permitted landfill.

5.2 Lead Affected Soil, Rock, or Fines

If lead contamination is suspected or if lead affected soil is discovered during the building survey or building demolition field activities, affected soil will be excavated and stored on an impermeable surface and covered with plastic sheeting or placed in lined closed top dumpsters. Composite samples will be collected from the soil and will be analyzed using the procedures set forth in 22 CCR Division 4.5. The RP Team anticipates that one composite soil sample consisting of four to eight aliquots will be sufficient for characterizing the soil associated with each building identified as having lead affected soil.

For larger excavation areas soil samples will be collected in general accordance with the Department of Toxic Substances Control (DTSC) “Information Advisory - Clean Imported Fill Material” dated October 2001. LFR anticipates that waste soil piles up to 1,000 cubic yards will be characterized by 1 composite soil sample per every 250 cubic yards of material or other analytical procedures as requested by the presumed disposal location.

5.3 Lead-Based Paint Chips and Ceramic Tiles

Known lead-containing waste streams created during work activities should be segregated from non-lead-containing waste streams. For example ceramic tiles and paint chips removed from buildings should be handled as lead-hazardous waste until bulk composite samples are collected and analyzed using the procedures set forth in 22 CCR

Division 4.5.

Depending on the results of the total threshold limit concentration (TTLC), soluble threshold limit concentration (STLC) and toxicity characteristic leaching procedure (TCLP) tests the materials will be labeled, packaged and manifested for disposal as either a federal hazardous waste, State of California hazardous waste or as non-hazardous waste at an appropriately permitted landfill.

5.4 Regulated Asbestos-Containing Material

Suspect asbestos-containing materials will be sampled and analyzed by polarized light microscopy for asbestos content. Materials determined to be greater than or equal to 1% asbestos will be considered an asbestos-containing material (ACM). Friable asbestos-containing materials and non-friable ACM that has been subjected to mechanical removal methods or is significantly damaged will be placed in labeled and doubled six-mil poly bags for transportation to the disposal facility as California Hazardous Waste.

5.5 Non-Friable Asbestos-Containing Material

Non-friable ACM such as roofing materials, floor tiles, Transite panels, etc., that are intact and have not been subjected to mechanical removal methods will be disposed of as nonhazardous asbestos-containing construction debris at a permitted Class 3 landfill. Shipment logs will be kept for non-friable ACM, a hazardous waste manifest is not required.

5.6 Treated Wood Waste

Used lumber treated with pentachlorophenol, creosote or other preservative treatments such as electric poles, telephone poles, and railroad ties will be disposed of at an approved landfill or hazardous waste disposal facility permitted to accept treated wood waste (TWW).

TWW will be segregated onsite from other materials and stored off the ground or on an impervious surface. Treated wood waste will be covered during inclement weather and labeled with the following information:

TREATED WOOD WASTE – Do not burn or scavenge.

TWW Handler
Name:_________________________
Address:_______________________
Accumulation Date:________________

Shipment logs will be kept for TWW, a hazardous waste manifest is not required.

5.7 Unpainted Construction Debris Not Planned for Recycling

Unpainted construction debris not suspected as being a TWW will be collected as disposed of at a permitted class 3 facility.

5.8 Unpainted Concrete-Recyclable

Unpainted concrete such as building foundations, non-asbestos concrete pipes and culverts, and like building materials will be collected, segregated and recycled.

5.9 Metal-Recyclable

Metals waste such as barbed wire, concertina wire, and used pipes will be collected and segregated and picked up by a metal recycler.

5.10 Asphalt-Recyclable

Asphalt and asphaltic concrete (AC) that is segregated during removal operations, for example demolition of road ways and parking lots, will be collected, segregated and sent for recycling.

5.11 White Goods

White goods will be collected and sent to a certified appliance recycler (CAR) for the removal of materials that require special handling and eventual recycling of the appliances.

5.12 Universal Waste-Lamps

Florescent lamps, sodium vapor lamps and high intensity discharge lamps will be removed intact, placed in padded recycling containers and brought to a recycler.

5.13 Universal Waste-Mercury Switches, Thermometers, and Gauges

Mercury switches, thermometers and gauges not installed in a building and not associated with an appliance or vehicle will be removed intact and placed in a padded recycling container for shipment to a mercury recycling facility.

5.14 Universal Waste-Batteries

Batteries found in alarm boxes, emergency lighting, rechargeable tools, as well as disposable batteries should be collected and stored as universal waste until they are sent to an approved recycler and/or disposal facility. Lead-acid type batteries (such as automotive batteries) should be recycled. Lead acid type batteries would be considered a hazardous waste if disposal is required.

5.15 Ballasts and Capacitors

Electrical ballasts and capacitors that are suspected to have been manufactured prior to 1979 and are not labeled “No-PCBs” should be removed intact and handled as if the unit contained PCBs at levels greater than or equal to 50 ppm and the disposition of these materials would be regulated under Toxic Substances Control Act (TSCA) and would be considered a Hazardous Waste in California.

Ballasts and capacitors labeled non-PCB may contain Di (2-ethylhexyl) phthalate (DEHP) and should also be removed intact segregated and sent to an approved recycler.

5.16 Lubricating Fluids

Used oil should be collected and segregated from other fluids to prevent contamination which would prevent recycling. The ESCA RP Team does not anticipate generating more than 55-gallons of waste oil from activities on the Site. Used oil should be collected by a certified hauler or delivered to a certified collection center to be recycled.

5.17 Vehicles and Related Debris (Non-Tire)

Vehicles and vehicle components should be sent to an approved recycler to allow for the reclamation of refrigerants, mercury switches, automotive fluids and similar items before scraping the vehicle.

5.18 Tires-Recyclable

The FORA ESCA RP Team does not anticipate generating more than 10 waste tires from operations at the Site however waste tires will be stored for collection by an approved Waste Tire Hauler and logged on a comprehensive trip log for recycling.

5.19 Wood and Vegetative Mulch

Where appropriate vegetative mulch will remain onsite to be used for erosion control or seed base. If a market exists salvage wood may be cut into fire wood and sold instead of being mulched.

5.20 Personal Protective Equipment (PPE) and Field Consumables

Used PPE will be disposed of as nonhazardous solid waste unless there is evidence of gross contamination, in which case the PPE will either be disposed as hazardous waste appropriate to the material handled or sampled and chemically tested to confirm a designation as non-hazardous.

5.21 Decontamination Water

Decontamination fluids will be containerized in DOT-approved 55-gallon drums or in temporary polyethylene storage tanks. When full, the drum and/or tank contents will be sampled and the samples submitted to an EPA–approved analytical laboratory for chemical analysis. The decontamination fluid containers will be labeled “Potentially Hazardous Waste Pending Further Investigation” until a hazardous or non-hazardous determination can be made based on the laboratory analysis results. The contents will then be disposed of appropriately based on the hazard designation.

5.22 Residual Fluids in Latrine Pits

Residual fluids from pit latrines will be pumped by an approved septic pumping company for treatment at a sewage waste treatment plant.

5.23 Munitions Debris

Non-recyclable munitions debris that requires disposal will be 100% investigated by the UXO technician before submitting the material for approval as free from explosives by the SUXOS and UXOQCS. The FFE munitions debris will be disposed of at an approved landfill.

6.0 LABELS AND HAZARD COMMUNICATION

All containerized materials will be appropriately labeled as required to allow workers sufficient warning as to the hazard potential of the container's contents. Labels should be of sufficient size to be clearly legible and display the container's content including if the material is a hazardous, an asbestos-containing, a TWW, a PCB-containing waste, a mercury-containing waste, or a non-hazardous waste. Additional information may be required on the label as required by specific regulation.

7.0 DISPOSAL OPTIONS

Hazardous, Asbestos-Containing, and TWW waste streams that are not scheduled for recycling will be stored in either satellite accumulation points or temporary (less than 90-day) storage areas. These waste streams will be manifested and transported for disposal or recycling in accordance with appropriate regulatory requirements. Disposal of hazardous streams will be at approved Class 1 treatment, storage, and disposal facilities.

Non-hazardous waste streams will be stored in general storage areas. Non-hazardous waste streams will be shipped using bills of lading, waste shipment records, or similar documentation. Non-hazardous waste streams not scheduled for recycling will be disposed only at approved Class 2 or Class 3 facilities.

Appendix E: Quality Assurance / Quality Control Project Plan

DRAFT FINAL
Group 1 Remedial Investigation / Feasibility Study Work Plan

Volume 2 - Sampling and Analysis Plan

Parker Flats Munitions Response Area Phase II

Former Fort Ord
Monterey County, California

November 13, 2008

Prepared for:

FORT ORD REUSE AUTHORITY

100 12th Street, Building 2880
Marina, California 93933

Prepared Under:

Environmental Services Cooperative Agreement
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and
FORA Remediation Services Agreement (3/30/07)

Document Control Number: 09595-08-086-005

Prepared by:

LFR

WESTON SOLUTIONS

Westcliffe Engineers, Inc.

CONTENTS

TABLE

APPENDICES

ACRONYMS AND ABBREVIATIONS

BADT	Best Available (and Appropriate) Detection Technology
cm	centimeter
DGM	digital geophysical mapping
DQOs	Data Quality Objectives
ESCA RP	Environmental Services Cooperative Agreement Remediation Program
FORA	Fort Ord Reuse Authority
GPS	Global Positioning System
m	meter
MEC	munitions and explosives of concern
mph	miles per hour
MQOs	Measurement Quality Objectives
MRA	Munitions Response Area
mV	millivolt
nT	nanoTesla
nT/ft	nanoTeslas per foot
ODDS	Ordnance Detection and Discrimination Study
Pd	probability of detection
QA	quality assurance
QC	quality control
RTK	real-time kinematic
UXOQCS	Unexploded Ordnance Quality Control Specialist

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E-1.0 PLAN OVERVIEW

The objective of the quality assurance/quality control (QA/QC) project plan is to provide unbiased evidence of the quality of the data acquired and decisions made during the munitions and explosives of concern (MEC) investigations, as evaluated against the measurement performance criteria described in this plan. The measurement performance criteria are called Data Quality Objectives (DQOs). The primary methods used to provide evidence of compliance with DQOs are:

- Prequalification of policies and procedures
- Acceptable performance on test grids
- Auditing of field activities
- Acceptance sampling of completed work

To support project DQOs, individual measurement quality objectives (MQOs) will be implemented to document that the procedures and acquired data can achieve the performance goals. MQOs include the implementation of a geophysical test plot, instrument standardization protocols, and set data collection parameters with pass/fail metrics to monitor and evaluate the geophysical results. QC measurement metrics will be verified during the geophysical test plot prior to further data collection. A summary of the DQOs and MQOs are provided in Table E-1.

The Fort Ord Reuse Authority (FORA) Environmental Services Cooperative Agreement Remediation Program (ESCA RP) is committed to using the Best Available (and Appropriate) Detection Technology (BADT) for locating subsurface MEC. As established by the Ordnance Detection and Discrimination Study (ODDS; Draft Final, Ordnance Detection and Discrimination Study, prepared for U.S. Army Corps of Engineers, Sacramento District, Parsons, December 2001) and subsequent projects, the goal is to use digital geophysical mapping (DGM) for subsurface investigations. Where there are physical impediments to the use of DGM, manual analog detection technologies are used.

E-1.1 Digital Geophysical Mapping

From an operational perspective DGM can be defined as four subsystems:

- Geophysical Survey
- Data Processing
- Anomaly Reacquisition
- Anomaly Excavation

This plan provides DQOs for each of the subsystems and also establishes DQOs for the overall DGM system.

System DQOs depend on all of the subsystems for their success. The system performance is described by the Probability of Detection (Pd) DQO, the Positioning Delta DQO, and the False Positive DQO.

E-1.2 Probability of Detection

Pd is a measure of whether the system successfully detects and recovers applicable MEC and MEC-like targets.

This plan has a multilevel approach to Pd. The first level DQO is the goal of 100% Pd. This means that any MEC, including QC surrogates (i.e., seeds), not detected and removed during operations will automatically trigger the creation of a Corrective Action Report. The project team will do a root cause analysis and determine if changes in equipment and/or procedures are warranted. The second level of Pd was created in recognition of the fact that DGM has inefficiencies and rarely if ever achieves the 100% Pd goal. The DGM processes used at the former Fort Ord are rated between 75 and 85% Pd for targets near or at the detection limits of the equipment. The project’s second level DQO for Pd is 85% with a 90% confidence level. If the project as a whole or any part of it drops below this level, then the project must be halted and full design review by the project team completed before work can begin again.

E-1.2.1 Positioning Delta

The Positioning Delta DQO states that the XY positioning provided to the reacquisition team is within a certain range of the actual target. The DQO is that the target must be found within 2 feet of the reported position.

E-1.2.2 False Positives

False Positive (No Contacts) refers to locations that are reported to the excavation team but nothing is recovered during the excavation. The DQO is that every false positive reported in the field must be resolved by the project geophysicist. If the geophysicist is picking close to noise level then the resolution may be reclassifying the target as noise. If it is a large anomaly, then the geophysicist will resubmit the anomaly to the dig team.

DQO	Metric	Measurement
Pd 1st level	100% of MEC in the established detection zone	Detection of seeded items
Pd 2nd level	85% Pd with a 90% confidence	Detection of seeded items
Positioning Delta	The delta will not exceed +/- 2 feet. This DQO is specific to the reported positions of the state-plane coordinates for each data point in the final version of the geophysical data.	Comparison of dig list with excavation report
False Positive	100% of false positives (No Contacts) must be resolved by geophysicist	Comparison of dig list with excavation report

To achieve the project Pd DQOs, each part or subsystem of the DGM system is evaluated from two perspectives:

- Is the subsystem designed to achieve the maximum efficiency possible?
- Is the subsystem operated to achieve the maximum efficiency possible?

E-1.3 Design

The evaluation of design is accomplished through two processes. The first is the prequalification of policies and procedures. This involves the reviewing of the policies and procedures for effectiveness and completeness by a professional in the appropriate field. The second process is the requirement to successfully complete test grids. A test plot grid is where MEC or MEC surrogates are buried in an approximation of the conditions that will be encountered in the project. The DGM system being tested must demonstrate the capability to locate and recover the MEC to the predetermined standard.

E-1.4 Operation

The evaluation of operation is accomplished through auditing. There are two methods of auditing employed. The first is called performance auditing. This is accomplished by burying a MEC or a MEC stimulant within the project boundaries. The system performance is evaluated based on whether the MEC is located and recovered. The second audit method is called a procedural audit. This method is accomplished by checking the field operation of a system component against the policies and procedures for that component. The policies and procedures describe the operating procedure that was established before and used in the test plot process.

Sections E-2.0 through E-4.0 describe each of the four subsystems and components of DGM in terms of design and operation.

E-2.0 GEOPHYSICAL SURVEY

There are two main components of the geophysical survey system:

- Navigation
- Geophysical Instrument

E-2.1 Navigation

E-2.1.1 Design DQO

This document sets a DQO standard for final DGM system positional accuracy and for kinematic positioning error of the navigation subsystem.

DQO	Metric	Measurement
Raw Positional Data	Kinematic positional error at known monuments will not exceed +/- 20 centimeters (cm)	QC audit of positioning system error test records

The proposed navigation subsystem is the Trimble 5700 or equivalent (R8 receiver), which is a real-time kinematic (RTK) Global Positioning System (GPS). The system is proven to meet or exceed the Raw Positional Data DQO.

E-2.1.2 Operations

- All operators will ensure that the RTK correction signal is locked (fixed) before collecting data.
- All operators who set up and operate the navigation subsystem will be trained in the navigation system setup and operation of GPS – RTK policies and procedures (Appendix A of this QAPP). A certification form for each operator will be on file in the main project office (Appendix B of this QAPP).

E-2.1.2.1 Quality Report

Appendix C of this QAPP contains samples of the Project Processing and Deliverable forms. The geophysicist will fill out this report daily and they will be on file in the project office.

E-2.1.2.2 Corrective Action

If the raw positional data does not exhibit RTK signal lock (fix), no data will be collected until the system meets the DQO standard.

E-2.2 Geophysical Instrument

E-2.2.1 Design

Five geophysical instruments (three digital and two analog), which use two different geophysical methods (time-domain electromagnetics and magnetometry) may be used. The three digital geophysical instruments that may be used are the data recording Geonics® EM61-MK2 (0.5-meter[m] by 1-m coils) time-domain metal detector, the Geometrics® G-858/822 digital magnetometer, and the Foerster magnetometer; all digital geophysical instruments record data. The two analog instruments that will be used are the Schonstedt® GA-52/Cx magnetic gradiometer and White's All Metals detector, which will be used for "mag and dig" operations, as necessary.

The selection of these geophysical instruments is based on two factors:

- The results of the ODDS
- Knowledge and experience gained during previous geophysical surveys at the former Fort Ord

The ODDS receiver operating characteristic curves for the various field trial sites indicate that several instruments would be best for the munitions and conditions anticipated at the former Fort Ord. Therefore, the reasons for selecting these five geophysical instruments are as follows:

- Some of the MEC items that were found in previous Fort Ord investigations were large items that had penetration depths greater than 24 inches. During the ODDS, the EM61-MK2 and G-858/822 were determined to be the best tools in detecting larger items at greater depths. However, the majority of the MEC recovered from the Parker Flats Munitions Response Area (MRA) Phase II were non-penetrating items.
- The anticipated types of MEC do not include any items that are completely nonferrous; therefore, either electromagnetic or magnetic techniques can be used. Electromagnetic techniques are preferable because they will help detect munitions that contain nonferrous components (e.g., grenade fuzes and signal illuminations [slap flares]).
- The EM61-MK2, G-858/822, Foerster, Schonstedt, and White's All Metals detector are durable and rugged enough to be used in the field, and they are commercially available.
- The Foerster offers superior field ability compared to the G-858/822. Prior to its selection for use at the Parker Flats MRA Phase II, the instrument will have to demonstrate detection characteristics similar to or better than the G-858/822 and be certified through a prove-out process that will include demonstration on a FORA ESCA RP geophysical test plot.

E-2.2.1.1 Certification

Preexisting Prove-out Grids

Due to extensive intrusive investigations already completed at the Group 1 MRAs it is not anticipated that additional types of MEC will be encountered. The proposed geophysical instruments (EM61-MK2, G-858/822 magnetometer, Schonstedt manual magnetometer, and White's All Metal detector) have all been certified through the ODDS as meeting the detection requirements of the Group 1 MRAs.

The goal of the project is to detect all MEC to their maximum detectable depths using the BADT. The following equation has been developed that describes the maximum detection depths for most MEC items (USACE DID FPRI-005-05.01):

Estimated depth of detection (m)* = 11 x diameter (millimeters)/1000

*measured to the center of mass of the item

Test Plots

The objective of establishing project-specific test plots is both design and operations. The geophysical test plot previously established in the Seaside MRA may be used to show that geophysical instruments are functioning properly. This is appropriate since the types of MEC found in the Parker Flats MRA are consistent with the types found in the Seaside MRA. A geophysical test plot may also be established in the Parker Flats MRA.

Geophysical Test Plot Reporting

Initial test plot results will be discussed between the Project Geophysicist and the QC Geophysicist. A report describing the design and initial results of the test plot will be submitted to the Project Team prior to beginning geophysical operations. Feedback will be included in the test plot report. The test plot report will include the following:

- As-built drawing of the test plot including depth and orientation of seeded items
- Representative photographs of the seed items
- Color plots of the DGM data
- Target dig lists showing comprehensive results
- Summary of the test plot results

E-2.2.2 Operations

E-2.2.2.1 EM61-MK2

The policies and procedures for the operation of the EM61-MK2 are provided in Appendix D for this QAPP. The policies and procedures are titled: Operational Use of the EM61-MK2 Single Unit and Operational use of the EM61-MK2 Towed Array.

- All operators who set up and operate the EM61-MK2 will be trained for proficiency in the policies and procedures outlined in Appendix D of this QAPP. A certification form for each operator will be on file in the main project office (Appendix B of this QAPP).
- The QC Geophysicist will conduct periodic audits of compliance with the policies and procedures (Appendix D of this QAPP) as well as spot checks of the daily Project Processing and Deliverable forms for the EM61-MK2 (Appendix C of this QAPP).

DQOs

The following EM61-MK2 DQOs must be met.

DQO	Metric	Measurement
Standard Deviation of background noise	Summed Channel = i.e., < 2 milliVolts (mV)	Run Statistics on all data below a reasonable level (between 7 and 9 mV)
Mean Acquisition Speed	< 3 miles per hour (mph)	Run Statistics on velocity between points in each file (created a “velocity channel”)
Along-Track Measurements	Along-track sampling densities should not exceed 0.5 foot	Run Statistics on distance between points in each file
Cross-Track Measurements	The across-track line spacing shall not exceed 3 feet. The surveys will be run to achieve a 2.5-foot spacing. 95% of the data in a grid must meet this metric. 5% of the data may lie between 2.5 and 3 feet. This will allow for variation in spacing reporting caused by rough terrain.	Run Statistics on distance between data lines in each file and a manual review based on gridded data between lines
Standard Response	Response above background to standard object will not vary more than +/- 20%	Standardization tests: QC audit of response test records

Quality Report

Appendix C of this QAPP contains samples of the Project Processing and Deliverable forms for the EM61-MK2.

Corrective Actions

Evaluation of compliance with many of the DQOs is made in the field at the beginning of the day when the QC function tests are performed. The survey may not begin until the equipment meets all of the relevant DQOs and passes all of the required tests.

Other DQOs, such as along-track and cross-track measurements, are evaluated by the data processing operator after the survey has been completed. If there is a violation of the operational DQOs, then a note is made in the project log and a Corrective Action Report is filled out. The grid will not be passed as completed until the Corrective Action Report is resolved. The corrective action resolution may involve a resurvey of the grid, but can also include other remedies as approved by the project team.

E-2.2.2.2 G-858/822

The policies and procedures for the operation of the G-858/822 are in Appendix E of this QAPP (Operational Use of G-856 Magnetometer and Operational Use of G-858/822 Magnetometer).

- All operators who set up and operate the G-858/822 will be trained for proficiency in the policies and procedures outlined in Appendix E of this QAPP. A certification form for each operator will be on file in the project office (Appendix B of this QAPP).
- The operators will fill out the Project Processing and Deliverable forms for the G-858/822 (Appendix C of this QAPP) when data are collected.
- The QC Geophysicist will conduct periodic audits of compliance with the policies and procedures as well as spot checks of the daily Project Processing and Deliverable forms for the G-858/822.

DQO	Metric	Measurement
Standard Deviation of Background Noise	Vertical Gradient = i.e., < 2.5 nanoTeslas (nT)	Run Statistics on all data below a reasonable level (between -10 and +10 nT)
Mean Acquisition Speed	< 3 mph	Run Statistics on velocity between points in each file (created a "velocity channel")
Along-Track Measurements	Along-track sampling densities should not exceed 0.5 foot	Run Statistics on distance between points in each file
Cross-Track Measurements	The across-track line spacing will not exceed 3 feet. The surveys will be run to achieve a 2.5-foot spacing. 95% of the data in a grid must meet this metric. 5% of the data may lie between 2.5 and 3 feet. This will allow for variation in spacing reporting caused by rough terrain.	Run Statistics on distance between data lines in each file and a manual review based on gridded data between lines
Diurnal Data Statement	The base station data should exhibit normal characteristics for such data (background variations of less than 1 nT) between measurements during periods without magnetic storms.	Examine data for spikes
Standard Response	Response above background to standard object will not vary more than +/- 20%	Standardization tests: QC audit of response test records

Quality Report

Appendix C of this QAPP contains samples of the Project Processing and Deliverable forms for the G-858/822.

Corrective Actions

Evaluation of compliance with many of the DQOs is made in the field at the beginning of the day when the QC function tests are performed. The survey may not begin until the equipment meets all of the relevant DQOs and passes all of the required tests.

Other DQOs, such as along-track and cross-track measurements, are evaluated by the data processing operator after the survey has been completed. If there is a violation of the operational DQOs, then a note is made in the project log. The grid will not be passed as completed until the violation is resolved. Resolution may involve a resurvey of the grid, but can also include other remedies as approved by the project team.

E-2.2.2.3 Schonstedt

The Schonstedt® GA-52/Cx handheld magnetometer has been approved for use at the former Fort Ord as documented in the ODDS. Schonstedts are typically used to locate ferrous anomalies, and are typically used in conjunction with the White's XLT® E Series metal detector.

Schonstedt magnetometer sweeps (i.e., "mag and dig") are particularly effective in areas where vegetation and terrain limit the use of larger digital systems. "Mag and dig" approaches will also be used when there is insufficient difference between MEC at the site and other metallic fragments and debris, such that digital discrimination is ineffective.

Prior to operating an analog instrument (i.e., Schonstedt and White's XLT® E Series), the analog operator will undergo and document the analog checkout procedure as defined in the Analog Locator QC Checkout Policy and Procedure Manual.

The analog instrument will be used during the following operations:

- Analog Locator Daily QC Checkout
- Analog Surveys ("mag and dig")
- Near-Surface Anomaly Detection
- Backhoe Excavations
- Analog Locator QC Surveys

The policy and procedure manual for Analog Locator Operations provides descriptions of these operations.

DQOs

The DQOs for Schonstedt operations are qualitative and depend on consistent use of the policies and procedures identified above.

Quality Report

The following policy and procedure manuals (Appendix F of this QAPP) contain the reporting forms related to the use of analog instruments:

- Analog Locator Operations
- Analog Locator Operator Checkout

E-2.2.2.4 White's All Metals Detector

The White’s XLT® E Series handheld all-metals detector is also commonly used for geophysical investigations. White’s All Metals detectors are typically used to locate all metal anomalies and are typically used in conjunction with the Schonstedt® GA-52/Cx handheld magnetometer.

White’s XLT® E Series handheld all-metals sweeps (i.e., “mag and dig”) are particularly effective in areas where vegetation and terrain limit the use of larger digital systems. “Mag and dig” approaches will also be used when there is insufficient difference between MEC and other metallic fragments and debris, such that digital discrimination is ineffective.

Prior to operating an analog instrument (i.e., Schonstedt and White’s XLT® E Series), the analog operator will undergo and document the analog checkout procedure as defined in the Analog Locator Checkout Policy and Procedure Manual (Appendix F of this QAPP).

The analog instrument will be used during the following operations:

- Analog Locator Daily QC Checkout
- Analog Surveys (“mag and dig”)
- Near-Surface Anomaly Detection
- Backhoe Excavations
- Analog Locator QC Surveys

The policy and procedure manual for analog locator operations, provides descriptions of these operations.

DQOs

The DQOs for Schonstedt operations are qualitative and depend on consistent use of the policies and procedures identified above.

Quality Report

The following policy and procedure manuals (Appendix F of this QAPP) contain the reporting forms related to the use of analog instruments:

- Analog Locator Operations
- Analog Locator Operator Checkout

E-2.2.2.5 Foerster Magnetometer

If the Foerster magnetometer is selected for use at Parker Flats MRA Phase II, a standard operating procedure will be prepared.

E-3.0 DATA PROCESSING

E-3.1 Design

Design encompasses the selection of all algorithms and software used in the data processing subsystem. The data processing engine used is Geosoft Oasis Montaj. This is the industry standard software for preprocessing and post-processing of geophysical data for MEC investigations.

E-3.2 Operations

The policies and procedures for data processing are included Appendix G of this QAPP (Quality Control Procedures and Geophysical Data Processing).

- All operators who conduct data processing will be trained for proficiency in the policies and procedures outlined in Appendix G of this QAPP. A certification form for each operator will be on file in the project office (Appendix B of this QAPP).
- The operators will fill out the Project Processing and Deliverable Forms (Appendix C of this QAPP).
- The QC Geophysicist will conduct periodic audits of compliance with the policies and procedures as well as spot checks of the daily Data Processing and Deliverables Report.

E-3.2.1 EM61-MK2 DQOs

DQO	Metric	Measurement
Electromagnetic Leveling Statement	For any given data set of electromagnetic data, all data channels will be leveled using the same routines and parameters when possible.	Not Applicable
Instrument Latency	Instrument latency will be corrected based on the lags or time differences observed in anomaly peak positions. Corrections will be applied using the appropriate correction routine that accounts for instrument latency time and sensor velocity. “Zig-zag” or “chevron” effects should not be visible in the data maps when plotted at the scales used to detect the smallest amplitude signal for a given MEC item.	Not Applicable
Processing Statement	All leveling and/or filtering routines that are applied to data sets will be evaluated, on a data set by data set basis, to confirm that those routines do not alter the nature of the original measured response.	Not Applicable

E-3.2.2 G-858/822 DQOs

DQO	Metric	Measurement
Magnetic Heading	For proper heading correction there should be no "striping" visible in the vertical gradient data above a 0.2 nT per foot (nT/ft) level between lines and no "striping" visible in total field data above a 0.4 nT/ft level between lines.	Not Applicable
Processing Statement	All leveling and/or filtering routines that are applied to data sets will be evaluated, on a data set by data set basis, to confirm that those routines do not alter the nature of the original measured response.	Not Applicable

E-3.2.3 Anomaly Selection DQOs

DQO	Metric	Measurement
Anomaly Selection	100% of anomalies that are above the project threshold are selected for anomaly reacquisition and excavation.	Visual and manual review by QC Geophysicist

E-3.2.4 Corrective Actions

In the event that it is discovered during data processing that the data from the field does not meet a DQO, then a Corrective Action Report will be filled out. In the resolution of the Corrective Action Report, it will be determined if a resurvey of the affected area is warranted or if the problem can be handled by reprocessing the data.

If the DQO failure is a Pd failure, meaning that MEC or a MEC surrogate was not selected for excavation, then a Corrective Action Report will be filled out. The report must be resolved with a root cause analysis and a proposed solution so as to avoid a repeat of the error. In the event that MEC did not present as a distinct anomaly that could be separated out through any means available, then it will be noted as such. If the number of unresolved MEC detection failures rises to a level where the Pd falls below 85%, then the project must be stopped and a complete design review undertaken before it can be restarted.

E-4.0 ANOMALY REACQUISITION AND EXCAVATION

E-4.1 Anomaly Reacquisition

The policies and procedures for anomaly reacquisition are in Appendix H of this QAPP (Anomaly Reacquisition and Excavation Procedure).

- All operators who conduct anomaly reacquisition will be certified for proficiency in the policies and procedures. A certification form for each operator will be on file in the project office (Appendix B of this QAPP).

E-4.1.1 Anomaly Reacquisition DQOs

DQO	Metric	Measurement
Flag Placement	Flags will placed within 20 cm of the position reported by the geophysicist	Not Applicable
Flag Completeness	100% of reported anomaly positions will be flagged	Not Applicable

E-4.2 Anomaly Excavation

The policies and procedures for anomaly excavation are in Appendix H of this QAPP (Anomaly Reacquisition and Excavation Procedure).

- All technicians will be certified for proficiency in the policies and procedures. A certification form for each technician will be on file in the project office (Appendix B of this QAPP).
- The Senior Unexploded Ordnance Supervisor will conduct periodic audits of compliance with the policies and procedures.

E-4.2.1 Anomaly Excavation DQOs

DQO	Metric	Measurement
Anomaly Excavation	100% of reacquired anomalies will be excavated.	Not Applicable
Reporting	Required information will be entered into the handheld data logger and verified daily.	Not Applicable

E-4.3 Quality Assurance and Quality Control Performance Audits

The primary method for performance auditing is to bury inert MEC or MEC-like items in the path of the survey. Performance is measured by calculating the ratio between seeds that were found and seeds that were not found.

E-4.3.1 Quality Control of Known Items

Quality Control items will be used during the geophysical data collection to quantify positional accuracy of each data set. The QC items will consist of 6-inch rebar spikes or equivalent inserted vertically.

The digital anomaly response from the QC item will be identified during data processing and analysis. Each seed item will be reviewed to quantify positional accuracy by measuring the anomaly target location to the actual geo-referenced location of the rebar spike recorded during the grid survey. The measured offset will be logged for each data set in the geophysical processing form spreadsheet. Offset distance between the anomaly target selection and the actual seed location will not exceed the reacquisition metric. One seed item per DGM data set is anticipated as part of the seeding program.

E-4.3.2 Quality Assurance Seeds

Blind seed items will be placed within areas planned for investigation. The project Unexploded Ordnance Quality Control Specialist (UXOQCS) in consultation with the Remediation Project Manager and Project QA Representative will determine the locations of the seed items.

Seeds will be located using a survey-grade GPS or equivalent within DGM grids. The blind seeds will consist of inert MEC items or equivalent buried no greater than the depth interval at which a 100% Pd was determined for the geophysical instrumentation to be used in that area. The location of the seed items will not be known to the on-site project personnel. QC and QA personnel will review the DGM data against the seed locations. The blind seeds will be detected within the reacquisition metric of the seed survey location.

Blind seed items will also be placed in near-surface investigation area grids as a quality indicator. The UXOQCS will seed the Munitions Debris items in randomly selected grids. The location of the seed items will be recorded in the QC log based on XY position and grid identification. The seed item location will be revisited by the UXOQCS during re-collection surveys in each seeded grid to ensure the seed item was detected and removed by the unexploded ordnance teams.

If any seed item is not picked and excavated, a Corrective Action Report will be initiated as per the 100% Pd DQO. Corrective actions nonconformance reviews will be conducted as presented in Section 11.7 of Volume 2 (Sampling and Analysis Plan) of the Group 1 Remedial Investigation / Feasibility Study Work Plan.

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Table E-1
Quality Control and Verification Summary

Data Quality Objectives / Measurement Quality Objectives	Measurement Verification	Performance
Digital Instrument Survey and Data Acquisition (Geonics EM61-MK2, Geometric G-858/822, Foerster Ferex Mk26)		
Static Background Function Test - Standard deviation of all four EM61-MK2 data channels are < 2 millivolts (mV). Standard deviation of magnetic data < 2.5 nanoteslas (nT).	Calculate standard deviation for pre- and post-survey static background function tests to verify noise levels. Report results on processing form.	Standard deviation of function tests and survey data will be < 2 mV or < 2.5 nT. If static background fails noise metric, determine root cause of ambient noise interference.
Static Response Function Test - Standard deviation of all four EM61-MK2 data channel is < 2 mV. Standard deviation of magnetic data < 2.5 nT. Response between pre- and post-survey tests will not vary more then 20%.	Calculate standard deviation for pre- and post-survey static response function tests to verify noise levels. Compare peak response from pre-survey test and post-survey test to determine percent difference. Report results on processing form.	Standard deviation of function tests and survey data will be < 2 mV or < 2.5 nT. If static response fails noise metric, determine root cause of ambient noise interference. If post-survey static response differs by 20% of pre-survey test, determine root cause of increased or decreased signal from test item.
Cable Connection Function Test - Standard deviation of all four EM61-MK2 data channels are < 2 mV. Standard deviation of magnetic data < 2.5 nT. No visible spikes observed in data.	Calculate standard deviation for pre- and post-survey static background function tests to verify noise levels. Review data profile to verify no spikes were introduced during test. Report results on processing form.	Standard deviation of function tests and survey data will be < 2 mV or < 2.5 nT. If static background fails noise metric, determine root cause of ambient noise interference. If spikes are observed in data, perform further tests to identify connection failure and repair.
Noise Level - Standard deviation of the sum of four EM61-MK2 data channels is < 2 mV. Standard deviation of magnetic data < 2.5 nT.	Calculate standard deviation for pre- and post-survey static background and static response function tests to verify noise levels. Window data set in an anomaly free area and calculate standard deviation to determine dynamic survey noise.	Standard deviation of function tests and survey data will be < 2 mV or < 2.5 nT. If function tests fail noise metric, determine root cause of ambient noise interference. If survey data fail noise metric, determine root cause of increased ambient or dynamic data collection related noise.
Mean Acquisition Speed - Speed during data collection is < 3 miles per hour (mph).	Calculate mean speed across data set using point to point distance and time. Report results on processing form.	Average data set speed will be < 3 mph. If speed exceeds metric, determine root cause of increase. Review along track measurements to ensure adequate data density. Recollect data as necessary based on corrective action.

Data Quality Objectives / Measurement Quality Objectives	Measurement Verification	Performance
Along-Track Measurements - Data points will be spaced < 0.5 feet.	Calculate point to point distance across data set. Report results on processing form.	Average along-track measurements in each data set will be < 0.5 feet. If distance exceeds metric, determine root cause of increase. Recollect data as necessary based on data gap metric or corrective action.
Across-Track Measurements - Survey lanes will not exceed 3 feet.	Use spatial analysis to identify areas where line spacing exceeds metric. Report results on processing form.	Surveys will be run to achieve a 2.5-foot spacing. 95% of the data in a grid must meet this metric. 5% of the data may lie between 2.5 and 3.0 feet. This will allow for variation is spacing reporting caused by rough terrain. Recollect data as necessary based on data gap metric or corrective action.
Navigation/Positioning - Positioning will be < 20 centimeters (cm).	Compare anomalies to known seed locations or monuments and measure offset.	Survey positioning will be < 20 cm. If offsets in a dataset exceed the metric, determine root cause by verifying instrument functionality, terrain considerations, and tree canopy. Recollect data as necessary based corrective action.
Analog Instrument Survey and Data Acquisition (Schonstedt and White's All Metals)		
Survey Speed	Senior Unexploded Ordnance Supervisor (SUXOS) shall observe operations and verify that operator instrument swing speed does not exceed best practices.	There is not a quantitative measure for analog instrument swing speed.
Lane Spacing	The Data Quality Objectives (DQOs) for analog operations are qualitative and depend on consistent use of the policies and procedures identified in this plan.	Individual survey lanes shall not exceed 3 feet in width.
Digital Data Processing and Analysis (Geonics EM61-MK2, Geometric G-858/822, Foerster Ferex Mk26)		
Processing Statement - Anomalies will not be altered by more than 10% from raw data.	Processes identified during geophysical test plot surveys will be used to correct all data.	All leveling and/or filtering routines that are applied to data sets will be evaluated, on a data set by data set basis, to confirm that those routines do not alter the nature of the original measured response by more than 10%. If metric is exceeded, correction parameters may be modified. Changes will be reported in the processing log.

Data Quality Objectives / Measurement Quality Objectives	Measurement Verification	Performance
Leveling/Drift Correction - Low frequency, long wavelength noise will be removed.	Window data set in an anomaly free area and calculate mean response to verify leveling/drift correction.	Mean response shall be within +/- 5 mV or +/- 5 nT. If metric is not achieved, verify leveling/drift correction routine parameters or check ambient noise levels.
Instrument Latency - No chevron effects visible in data set.	Latency tests will be run daily to determine time delays related to the digital instrumentation.	Instrument latency will be corrected based on the lags or time differences observed in anomaly peak positions. Corrections will be applied using the appropriate correction routine that accounts for instrument latency time and sensor velocity. “Zig-zag” or “chevron” effects should not be visible in the data maps when plotted at the scales used to detect the smallest amplitude signal for a given munitions and explosives of concern (MEC) item.
Magnetic Heading Correction - No striping visible in magnetic data.	Conduct magnetic heading tests as needed to determine and subsequently correct for magnetic response changes due to travel direction.	No striping visible in the vertical gradient data above a 0.2 nT per foot (nT/ft) level between lines and no striping visible in total field data above a 0.4 nT/ft level between lines. If metric is exceeded, check magnetic heading tests and parameters used for correction.
Anomaly Selection - All anomalies meeting the approved selection criteria will be added to the dig list	The Quality Control (QC) Geophysicist will review the digital data sets to ensure all anomalies meeting the selection criteria are selected.	100% of all anomalies meeting the selection criteria were selected. Missing or QC anomalies will be added to the dig list.
Field Investigation and Reporting (Geonics EM61-MK2, Geometric G-858/822, Foerster Ferex Mk26)		
MEC Detection - 100% of MEC in the established detection zone.	All metrics will be verified to ensure data achieve measurement quality objectives (MQOs). Use QC seeds to determine detection ability during surveys. Confirm with QC procedures.	All MEC (37mm projectile and greater) will be detected within established detection zone. If MEC is identified, determine root cause by using measurement quality objective results and recollect data as necessary based on corrective action.
False Positives - Reduce number of false positives. Resolve false positives identified as “no contacts”.	Review excavation results to identify no contacts. Use field notes to determine terrain variation or cultural interference which may have influenced the digital data.	Resolve 100% of no contacts. Processing and analysis procedures may need to be modified to reduce false positives.

Data Quality Objectives / Measurement Quality Objectives	Measurement Verification	Performance
False Negatives - No false negatives identified in data sets.	Perform post-dig QC steps to verify no MEC was missed during data processing or data collection.	All MEC (37mm projectile and greater) will be detected within established detection zone. If MEC is identified, determine root cause by using measurement quality objective results and recollect data as necessary based on corrective action.
Anomaly Reacquisition - Pin flags will mark the anomaly location within 20 cm of the position reported on the dig list.	Known QC spikes will be within 20 cm of marked/flagged location.	Anomaly reacquisition will be performed on selected digital geophysical mapping (DGM) anomalies throughout the duration of the project. 95% of the locations of reacquired anomalies should lie within 1 meter of their original surface location as marked on the dig list.
Dig List Backcheck - 100% of reported anomaly positions will be reacquired and flagged.	Unexploded Ordnance Quality Control Specialist (UXOQCS) and QC Geophysicist will verify dig list with dig results.	All anomalies will be reacquired. Missing anomalies will be reacquired and investigated.
Anomaly Excavation - 100% of reacquired anomalies will be excavated.	UXOQCS and QC Geophysicist will verify dig list with dig results.	95% of excavated items should lie within an approximate 1-ft radius of their mapped surface location as marked in the field after reacquisition.
Reporting - 100% of anomalies will be resolved.	Required information will be entered into the handheld data logger and verified daily.	No missing investigation information is evident on dig list.
QC Geophysical Surveys (Geonics EM61-MK2, Geometric G-858/822, Foerster Ferex Mk26)		
QC-1 - No MEC remains following excavation.	Verify removal of the source of each DGM anomaly within 3 feet of a flag. Location will be checked using the same instrument used for survey.	All MEC will be recovered during excavation. If the source of the anomaly does not appear to have been removed, the intrusive operation will continue until a significant reduction in signal is observed by the instrument operator.
QC-2 - No additional MEC recovered within original survey area.	Digital resurveying of 16% percent of the DGM investigation areas.	A failure will be constituted by the discovery of MEC or similar item, or five re-acquirable anomalies as a result of the QC survey, or the discovery during the QC process of five non-selected anomalies that should have been selected during the initial survey within a single 100-foot by 100-foot grid (with dimensions similar to a 37 mm projectile or greater). Perform Root Cause Analysis and identify and implement Corrective Action.

Data Quality Objectives / Measurement Quality Objectives	Measurement Verification	Performance
QC-3 - No additional MEC recovered within original survey area.	Analog resurveying of 10% percentage of each 100-foot by 100-foot grid.	A failure will be constituted by the discovery of MEC or similar item, or five re-acquirable anomalies as a result of the QC survey, or the discovery during the QC process of five non-selected anomalies that should have been selected during the initial survey within a single 100-foot by 100-foot grid (with dimensions similar to a 37 mm projectile or greater). Perform Root Cause Analysis and identify and implement Corrective Action.

APPENDIX A

Navigation System Setup and Operation of Global Positioning System – Real-Time Kinematic

<table>
<tr><td colspan="3">WSI
POLICY AND PROCEDURE MANUAL</td></tr>
<tr><td colspan="2">SUBJECT: Navigation System Set-up and Operation of Global Positioning System (GPS) – Real time Kinematic (RTK)</td><td>No. Op.001.nav.rtk</td></tr>
<tr><td>EFFECTIVE DATE: February 11, 2008</td><td colspan="2">SUPERSEDES:</td></tr>
<tr><td>SECTION: Geophysics Group</td><td colspan="2">DEPARTMENT: OU 1494</td></tr>
<tr><td colspan="3">NAME/TITLE: J. Williams/Sr. Technical Manager</td></tr>
<tr><td>SIGNATURE: John A Williams Jr</td><td colspan="2">DATE APPROVED: February 05, 2008</td></tr>
</table>

1. PURPOSE

This procedure outlines the technical requirements and operational use of the RTK GPS for use in geophysical surveys.

2. APPLICABILITY AND SCOPE

The requirements of this procedure are applicable to all project activities which include the use of the RTK GPS. The instrument is utilized to collect real-time corrected GPS positions used to precisely locate geophysical sensors while collecting data. The data generated is streamed directly into geophysically instruments providing sub-centimeter accuracy of positions.

3. REFERENCES

   3.1. TrimbleR7-R8_223A_UserGuide, Trimble Webpage

4. DEFINITIONS

   4.1. Central Equipment Stores (CES) - WESTON's central equipment storage location in West Chester, PA. This group is responsible for securing, maintaining, and distributing equipment.

   4.2. Real-Time Kinematic (RTK) Global Positioning System (GPS) components:

      4.2.1. R8 Global Navigation Satellite System (GNSS) – advanced global positioning tracking receiver capable of acting as a base and rover receiver. Unit is capable of achieving accuracies of +/- 10 mm horizontal and +/- 20 mm vertical accuracy.

      4.2.2. HPB450 Series Radio Transmitter – powerful radio capable of broadcasting real-time correction signals from base R8 to rover R8 at 35 watts.

      4.2.3. Trimble TSC2 Data Collector – data collector with Survey Controller software for stakeout and collecting points.

5. SET-UP AND OPERATION

This section outlines the steps for setting up the RTK GPS system in the field for use with geophysical instruments. Be sure to follow all operating manuals for set-up and operation.

5.1. An established control point (of necessary accuracy) must be known before starting an RTK survey. Set up the base unit tripod over the control point and level the tripod.

5.2. Place the base receiver on the tripod and connect the power to Port 1 on the receiver. The receiver should turn on as soon as power is applied. Confirm that the satellite led on the front display is blinking yellow at one second intervals.

5.3. Set-up the second tripod and assemble the radio antenna and connect it to the tripod. Connect the coaxial cable to the back of the radio and connect the power cable to an external battery.

5.4. Turn on the datalogger and open Survey Controller software.

5.4.1. Click on Configuration – Controller – Bluetooth

5.4.2. Make sure Bluetooth is turned on and select the corresponding serial number (located beneath the base receiver on barcode) and click connect, then accept. Return to main menu. Make sure data logger is displaying the satellite number and power display of the receiver.

5.4.3. Select Survey – RTK – Start Base Station

5.4.3.1. Under the point name click – List and then select the point you have entered for the control point in which you are set-up over (note the station index marked). Click Start, the data logger will begin to start the receiver and tell you when you can proceed to the next step. Make sure that the radio is transmit led (TX) is blinking every second.

5.4.4. Power up the rover receiver, and connect to it via Bluetooth via step 5.4.2 except find the corresponding serial number for the rover receiver and connect, then click accept.

5.4.5. Once the logger connects to the rover receiver (showing the satellite count and battery power on the logger screen), go to Survey – RTK – Start Survey. The controller will search for a base station broadcast and display the station index (if this is the same as the one you entered when you started the base) click accept. The survey will begin, wait for initialization (< 5 seconds) and confirm RTK fix by the display at the bottom of the logger (will display RTK fix and you horizontal and vertical accuracy). You are now ready to survey.

5.4.6. Configuration file must be uploaded to the R8 rover receiver in order to stream the NMEA string into the geophysical data collector. Connect the Lemo-9 pin to Port 1 on the R8 Rover receiver and the female serial DB9 cable to the corresponding connection on the geophysical sensor. Open the chat mode or terminal screen on the geophysical survey logger and verify NMEA string is communicating with the geophysical data collector. You are now ready to collect data.

6. Navigational QC Check

6.1. Weston Solutions, Inc. performs navigational accuracy checks daily during the latency test performed to measure instrument delay time. This is performed by traversing a survey spike of known coordinates with the geophysical sensor(s) in two directions. The surveyed peak amplitude location must be within 1 foot of the actual survey spike. If differences are noticed, first make sure the operator is surveying directly over the spike, and then check the rover receiver by mounting the R8 rover on the range pole and navigate to the same point and determine the offset. If still unacceptable make sure step 5 was followed correctly. All reporting will be carried out in the daily latency reporting. QC seed items are sometimes planted in geophysical grids, these serve as a secondary test on navigational accuracy.

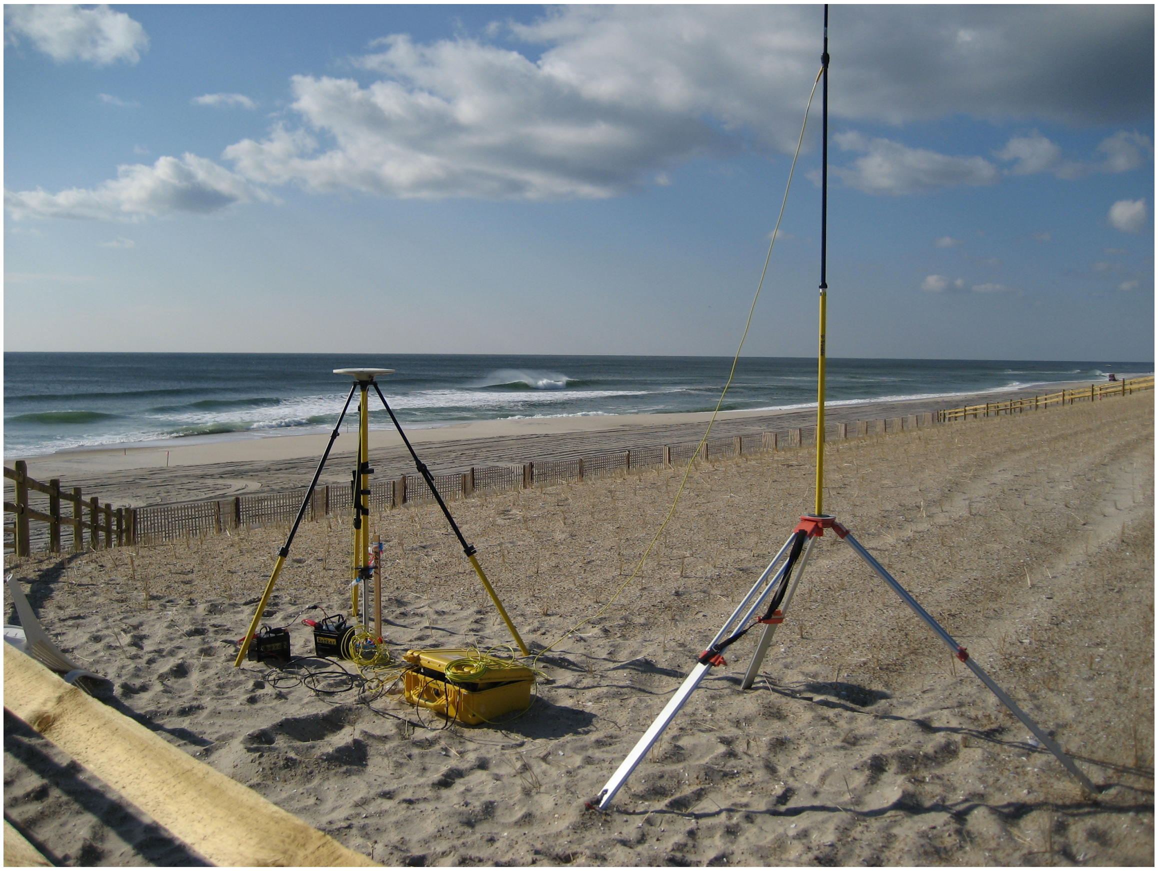
<u>Applicable References:</u>

Trimble R7-R8_223A_UserGuide, Trimble Webpage

Project Specific Work Plan - Data Quality Objectives (DQO) with established metrics

Review/Revision Date:	J. Williams - 02/04/08
Original Prepared By/Date:	M. Saunders – 01/14/2008
Revision #1 –	

Photo 1 Field Set-up of the RTK GPS



APPENDIX B

Geophysical Standard Operating Procedure Checklist

WSI *POLICY AND PROCEDURE MANUAL*	
SUBJECT: Geophysical SOP Checklist	**No**. Op.001.SOPCertChcklst.
EFFECTIVE DATE: May 13, 2008	**SUPERSEDES:**
SECTION: Geophysics Group	**DEPARTMENT**: OU 1494
NAME/TITLE: J. Williams/Sr. Technical Manager	
SIGNATURE: John A Williams Jr	**DATE APPROVED:** May 13, 2008

By placing my signature below, I certify that I have read the following (checked) Geophysical Standard Operating Procedure (SOP) and fully understand its procedures and requirements. The procedures set forth therein can only be superseded by site-specific work plans, or as directed by the Project Geophysicist or QC Geophysicist.

☐ **Op.001.nav.rtk**: Navigation System Set-up and Operation of Global Positioning System (GPS) – Real Time Kinematic

☐ **Op.001.em61mk2.ta**: Operational use of the EM61-MK2 Towed Array

☐ **Op.001.em61mk2.su**: Operational use of the EM61-MK2 Single Unit

☐ **Op.001.G856.mag**: Operational use of G-856 Magnetometer

☐ **Op.001.G858.mag**: Operational use of G-858 Magnetometer

☐ **Op.001.Analog Locator Operations.su**: Analog Locator Operations

☐ **Op.001.Analog Operator Checkout.su**: Analog Locator Operator Checkout

☐ **Op.001.QCdat**: Quality Control Procedures and Geophysical Data Processing Anomaly Selection

☐ **Op.001.reac**: Anomaly Reacquisition and Excavation Procedure

Print Name:___________________________ Signature:_______________________________

Company: _____________________________ Date: __________________

APPENDIX C

Project Processing and Deliverable Forms

Daily Notes

Project	Date
Mare Island DGM	3/13/2006

Days Weather
PC 50

Daily Notes

0630 Onsite
0700 H&S meeting
0800 Team JH and TF planting seeds in entire PMA/SSA. GT putting final touches on EM towed array.
1230 Navy seeded SSA and PMA area

No data collected
Onsite:
M. Saunders
G. Turner
T. Fitzgerald
J. Hunter

Equipment Used
RTK GPS

Daily Mag Acreage	Total Mag Acreage	Daily EM Acreage	Total EM Acreage
	0		0

EM Data Processing

Date of Survey:	4/3/2006
Team ID:	Team 1
File Name:	0403_EM_TowedArray
Internal QC Performed On:	4/4/2006
Geosoft Database:	0403_EM_TowedArray.gdb
Weston QC Performed On:	4/26/2006
Instrument:	EM61-MK2 Towed Array
Weston QC Initals:	JAW

Drift Correction ☑ Were QC evaluation tests performed ☑

Latency Coil AM:	0.3
Latency Coil PM:	0.3

Velocity:	2.1	< 2.5 mph
Mean Sample Seperation:	0.31	< 0.5 ft
Channel Analyzed:	Clipped Area	

Noise Mean:	0	
Noise Standard Deviation:	0	< 3.0

Target Selection ☐ Target Selection Database:

Target Selection Threshold:

Processing Notes:

Latency Coil 1 = 0.25
Latency Coil 2 = 0.3
Latency Coil 3 = 0.3

Not able to determine good Noise mean and St Dev due to large dynamic values present in the data.

Seed in DGM Area ☑

Seed ID:	QC143	Anomaly ID:	Closest Anomaly	
Seed Easting:	1855528.294	Anomaly Easting:	1855527.51	
Seed Northing:	13826257.425	Anomaly Northing:	13826256.98	
Seed Depth:	0	Anomaly Distance:	0.90148821414	<2 ft
Seed Orientation:	Vertical	Anomaly Orientation:	WSW	
Acres Surveyed:	1.798	Total Acres Surveyed to Current Date	1.798	

Mag Data Processing

Team ID	Team 1	**Internal QC Performed On:**	3/16/2006
Survey Date	3/15/2006	**Weston QC Performed On:**	4/4/2006
Geosoft database	0315_MagCart.gdb	**Weston QC Initials:**	JAW
Instrument	MagCart		

Data Processing

Drift Correction ☐ **Diurnal Correction** ☑

Latency 0

Dynamic Background Levels

Clipping Values:

	Mean	Std. Dev. <3.0
Background Noise:	0	0

Target Selection

Target Database U-Hunter Software

Initial Target Screening Level U-Hunter Software

Seed Characterization

Seed ID: QC144

Target ID: Closest Anomaly

Target Offset Distance: 1.1936 **< 2.0ft**

Offset Direction: NW

Data Sampling

Velocity (<= 2.5 mph) 2.32

Sample Separation (<=0.5 ft) 0.28

Processing Notes: No Latency Correction Required

Acres Surveyed 1.38 **Total Acres Surveyed** 1.38

EM QC Report

Survey Date	4/3/2006
Team ID	Team 1
Geosoft db	0403_EM_TowedArray_QC.gdb
Instrument ID	EM61 MK2
Sensor Number	Blue
Internal QC Performed On:	4/5/2006
Weston QC Performed On:	4/26/2006
Weston QC Initals:	JAW

Static Background Test

	Pre-Survey				Post-Survey			
	CH1	CH2	CH3	CH4	CH1	CH2	CH3	CH4
Maximum	0.68	0.41	0.25	0.22	0.59	0.42	0.33	0.33
Minimum	-0.36	-0.27	-0.16	-0.16	-0.37	-0.36	-0.17	-0.16
Mean	0.1	0.07	0.05	0.03	0.09	0.08	0.05	0.05
Std. Dev. < 2.0	0.13	0.09	0.07	0.06	0.13	0.1	0.07	0.07

Static Spike Test

	Pre-Survey				Post-Survey			
	CH1	CH2	CH3	CH4	CH1	CH2	CH3	CH4
Maximum	317.46	234.55	143.53	6.43	379.89	275.65	174.06	7.9
Minimum	-212.12	-113.25	-66.19	-4.21	-251.64	-124.55	-88.89	-4.37
Mean	87.9	54.6	35.8	1.77	93.14	60.61	37.65	1.75
Std. Dev. <2.0	99.57	66.42	41.47	2.02	110.52	72.28	42.95	2.12

Cable Connection Test

	Pre-Survey				Post-Survey			
	CH1	CH2	CH3	CH4	CH1	CH2	CH3	CH4
Maximum	0.5	0.44	0.3	0.2	0.99	0.52	0.27	0.24
Minimum	-0.3	-0.2	-0.16	-0.15	-0.39	-0.18	-0.16	-0.16
Mean	0.09	0.08	0.05	0.03	0.13	0.09	0.06	0.03
Std. Dev. <2.0	0.14	0.1	0.07	0.06	0.18	0.11	0.08	0.06

Comments: Values displayed are the drift corrected values for the Pre and the Post QC Survey. Static Spike test indicates object used for QC object (2 inch trailer balls fixed in a 2x4, positioned on the coils) was too great a response. Different object to be used next time. - MS

GEOPHYSICS DAILY
EM61-MK2 Towed Array CHECKLIST

Date:

Team ID:

Team Members:

Weather:

Approx Survey Area:

☐ Warm-up Instruments

☐ Check Coil Offsets

Quality Control Tests AM

Remember to increment your AM and PM Lines in your AM and PM QC Files!!!!

QC Filename:

☐ Static Test (1 min.) ☐ Line Number:

☐ Static Spike (1 min) Line Number(s):

☐ Cable Shake (30 sec.) Line Number:

☐ Latency Loop Line Numbers:

☐ Repeat Lines Collected Line Numbers

Quality Control Tests PM

QC Filename:

☐ Static Test (1 min.) ☐ Line Number:

☐ Static Spike (1 min) Line Number(s):

☐ Cable Shake (30 sec.) Line Number:

☐ Latency Loop Line Numbers:

Survey Filename(s):	Operator(s):	Line Numbers:

Survey Notes:

GEOPHYSICS DAILY MagCart Checklist

Date:

Team ID:

Team Members:

Weather:

Approx Survey Area:

- [ ] Warm-up Instruments
- [ ] Check Sensor Offset Measurements

QC Filename: Dataset1 (Always put all QC in Dataset 1)

Quality Control Tests AM

- [ ] Static Test (1 min.) Line Number:
- [ ] Spike Test (Jig 1 min) Line Number:
- [ ] Cable Shake (30 sec.) Line Number:
- [ ] Latency Loop Line Number:
- [ ] Repeat Lines Collected (PUT GRID ID's with line #)

Quality Control Tests PM

- [ ] Static Test (1 min.) Line Number:
- [ ] Spike Test (Jig 1 min) Line Number:
- [ ] Cable Shake (30 sec.) Line Number:
- [ ] Latency Loop Line Number:

Survey Filename(s):	Operator(s):	Line Numbers:

Survey Notes:

MAG QC Report

Survey Date	3/15/2006	**Sensor Number**	1
Team ID	1	**Sensor Serial #**	C498
Geosoft db	0315_MagCart_QC.gdb		

Internal QC Performed On:	3/16/2006
Weston QC Performed On:	4/4/2006
Weston QC Initials:	JAW

Static Background Test

AM Mean	392.91		**PM Mean**	396.98	
AM Std Dev	0.53	**<2.0**	**PM Std Dev**	0.16	**<2.0**

Static Spike Test

AM Mean	555.7		**PM Mean**	559.93	
AM Std Dev	0.31	**<2.0**	**PM Std Dev**	0.61	**<2.0**

Cable Connection Test

AM Mean	393.49		**PM Mean**	395.8	
AM Std Dev	2.18	**<2.0**	**PM Std Dev**	0.18	**<2.0**

Comment: Switched out Sensor 1 and replaced with C498. Deviation in AM Cable Test is personnel walked to close to sensor, note PM cable test is OK along with sensor 2 AM cable test. MS.

APPENDIX D

Operational Use of the EM61-MK2 Single Unit and Operational Use of the EM61-MK2 Towed Array

WSI POLICY AND PROCEDURE MANUAL		
SUBJECT: Operational use of the EM61-MK2 Single Unit		**No**. Op.001.em61mk2.su
EFFECTIVE DATE: February 11, 2008		**SUPERSEDES:**
SECTION: Geophysics Group		**DEPARTMENT**: OU 1494
NAME/TITLE: J. Williams/Sr. Technical Manager		
SIGNATURE:	John A Williams Jr	**DATE APPROVED:** February 5, 2008

1. PURPOSE

This procedure outlines the technical requirements and operational use of the Single Unit EM61-MK2 TDEM for use in geophysical surveys.

2. APPLICABILITY AND SCOPE

The requirements of this procedure are applicable to all project activities which include the use of the EM61-MK2. The instrument is utilized to collect transient electromagnetic signals from the subsurface up to a depth of four feet (unofficial estimate). The data generated are collected concurrently with a navigational system (RTK or total station) and stored on an Allegro CX field computer.

3. REFERENCES

 3.1. EM61-MK2 Operating Manual, Geonics Limited.

4. DEFINITIONS

 4.1. Central Equipment Stores (CES) - WESTON's central equipment storage location in West Chester, PA. This group is responsible for securing, maintaining, and distributing equipment.

 4.2. EM61-MK2 components:

  4.2.1. Bottom 1 m x 0.5 m coil (including wheels)

  4.2.2. Top 1 m x 0.5 m coil

  4.2.3. Backpack with electronics box, batteries and chargers

  4.2.4. Two meter cable to connect electronics box with Bottom Coil

  4.2.5. Pig tail connector to connect Bottom Coil to Top Coil

4.2.6. Handle

4.2.7. Navigational mount

4.2.8. Allegro CX Data Logger (battery charger, data link and download cables)

5. SET-UP AND OPERATION

This section outlines the steps for setting up the EM61-MK2 system in the field for the acquisition of geophysical data using a Global Positioning System (GPS). Be sure to follow all operating manuals for set-up and operation.

5.1. Assemble EM61-MK2 according to operating manuals.

5.2. Interface the EM61-MK2 with a navigational system for precise location data. Connect serial cable from navigational system into Port 2 on the Allegro CX.

5.3. Set-up the specific data collection software (Dat61MK2 or NAV61MK2) on the Allegro CX field computer.

5.3.1. Set the appropriate data collection rate (sampling rate, i.e. 10 Hz for MEC mapping).

5.3.2. Set the EM61-MK2 to interface with COM1 and the navigation device to interface with COM2.

5.3.3. Adjust line increments and stations start as needed.

5.4. Perform 10-15 minute warm-up of EM61-MK2 according to ambient temperature.

5.5. Perform spot check readings to locate an area free of noise and representative of background to null the instrument and perform QC function tests.

5.6. Perform Pre-survey QC function tests (see separate QC SOP) which usually consists of a 2-3 minute Static Test (remain stationary with no object – record readings), Static Spike (remain stationary with a metallic object [i.e. 5-6 inch ½ diameter rebar] beneath coil – record readings), and 0.5-1 minute Cable Vibration Test (remain stationary with no object moving cables – record readings). Note any spikes or abrupt changes in data.

5.7. Perform Latency Test

5.8. If all QC data is verified, collect data, according to operating manual.

5.8.1. If a Geophysical Prove-out survey is required, data acquisition will be performed following the guidance established in the Site Specific GPO Work Plan.

5.8.2. For production surveys, data acquisition will be performed following the guidance established in the Site Specific Geophysical Investigation Plan (GIP).

Applicable References:

Geonics, Ltd., 1996, www.geonics.com/em61.html.

Geonics, Ltd. 1999. *Operating Manual for EM61-MK2 61 High Sensitivity Metal Detector*.

McNeill, J.D. 1980. "*Electromagnetic Terrain Conductivity Measurements at Low Induction Number*." Technical Note TN-6, Geonics, Ltd., Mississauga, Ontario.

Plugge, D., R. J. Selfridge, and R. Young. 2003. *Planning Geophysical Prove outs for Munitions Response Projects.* Huntsville, Ala.: U.S. Army Engineering and Support Center.

USAESCH (U.S. Army Engineering Support Center, Huntsville). 2003. Munitions Response Data Item Descriptions (DIDs). Revised 1 December 2003.

Project Specific Work Plan - Data Quality Objectives (DQO) with established metrics

Review/Revision Date:	J. Williams - 02/04/08
Original Prepared By/Date:	M. Saunders – 01/14/2008
Revision #1 –	

<table>
<tr><td colspan="4">WSI
POLICY AND PROCEDURE MANUAL</td></tr>
<tr><td colspan="3">SUBJECT: Operational use of the EM61-MK2 Towed Array</td><td>No. Op.001.em61mk2.ta</td></tr>
<tr><td colspan="2">EFFECTIVE DATE: February 11, 2008</td><td colspan="2">SUPERSEDES:</td></tr>
<tr><td colspan="2">SECTION: Geophysics Group</td><td colspan="2">DEPARTMENT: OU 1494</td></tr>
<tr><td colspan="4">NAME/TITLE: J. Williams/Sr. Technical Manager</td></tr>
<tr><td>SIGNATURE:</td><td></td><td colspan="2">DATE APPROVED: February 5, 2008</td></tr>
</table>

1. PURPOSE

This procedure outlines the technical requirements and operational use of the EM61-MK2 Towed Array for use in geophysical surveys.

2. APPLICABILITY AND SCOPE

The requirements of this procedure are applicable to all project activities which include the use of the EM61-MK2 Towed Array. The instrument is utilized to collect transient electromagnetic signals form the subsurface up to a depth of four feet (unofficial estimate – dependent on size of target). The data generated from the multiple EM61-MK2 are collected concurrently with a navigational system (RTK or total station) and stored on a field computer running MagLogNT software from Geometrics.

3. REFERENCES

3.1. EM61-MK2 Operating Manual, Geonics Limited.

3.2. MagLogNT operating manual, Geometrics Inc.

4. DEFINITIONS

4.1. Weston Geophysics Group - WESTON's geophysics team in West Chester, PA. This group is responsible for securing, maintaining, and distributing equipment.

4.2. EM61-MK2 Towed Array components (number of EM61-MK2 units dependent on particular array configuration (usually 3 or 4 units):

4.2.1. Bottom 1 m x 0.5 m coil

4.2.2. Top 1 m x 0.5 m coil

4.2.3. Electronic boxes

4.2.4. 7 meter cables to connect electronic boxes with Bottom Coil.

4.2.5. Sync Cable?

4.2.6. Pig tail connectors to connect Bottom Coil to Top Coil

4.2.7. Navigational mount

4.2.8. Panasonic Toughbook with MagLogNT software.

4.2.9. Towed Array pieces made of fiberglass and fiberglass nuts and bolts to assemble the array.

4.2.10. Tow vehicle – usually a John Deere Gator or Kubota Utility Vehicle.

5. SET-UP AND OPERATION

This section outlines the steps for setting up the EM61-MK2 system in the field for data collection. Be sure to follow all operating manuals for set-up and operation.

5.1. Assemble Towed Array components according to labeled pieces and color coding.

5.2. Assemble EM61-MK2s according to operating manuals and configure on the Towed Array according to the specific project objectives (i.e. line spacing).

5.3. Interface the one of the EM61-MK2 with a navigational system and mount for precise location data.

5.4. Connect the main tow beam on the receiver hitch on the tow vehicle. Be sure to attach safety cabling from the tow beam to the back of the tow vehicle in case the hitch becomes dislodged during survey (it won't pull by the electronics cables it will pull by the safety cabling).

5.5. Connect all 7 meter cables from the multiple EM61-MK2s along the main tow beam and into the back of the tow vehicle and connect to the electronics boxes in the appropriate interface. Be sure to enclose the cables in some protective covering and tape so everything is tight against the beam.

5.6. Connect the electronic boxes cables into an interface device (either a 4 port serial hub or PCMCIA adapter). Then connect the cable from the serial hub into the USB port on the field computer.

5.7. Set-up the MagLogNT software on the field computer. The most important thing is that the port settings are the set correctly. If using the serial hub the ports are usually 5, 6, 7, and 8. Set MagLogNT to interface with all the units according to their port assignments, be sure to make certain you know which EM61-MK2 unit is connected to which port. The same procedure is followed for setting up the GPS port assignment. See Photo 5.1 for an example of one of the Towed Array configurations

5.7.1. Set the appropriate data collection rate (sampling rate, i.e. 10 Hz for MEC jobs).

5.8. Perform 10-15 minute warm-up of EM61-MK2 according to ambient temperature.

5.9. Perform Pre-survey QC (see separate QC SOP) which usually consists of a 2-3 minute Static Test (remain stationary with no object – record readings), Static Spike (remain stationary with a metallic object beneath coil – record readings), and Cable Vibration Test (remain stationary with no object moving cables – record readings). Note any spikes or abrupt changes in data.

5.10. Perform Latency Test

5.11. If all QC data is verified, collect data, according to operating manual.

<u>Applicable References:</u>

Geonics, Ltd., 1996, www.geonics.com/em61.html.

Geonics, Ltd. 1999. *Operating Manual for EM61-MK2 61 High Sensitivity Metal Detector.*

McNeill, J.D. 1980. "*Electromagnetic Terrain Conductivity Measurements at Low Induction Number.*" Technical Note TN-6, Geonics, Ltd., Mississauga, Ontario.

Plugge, D., R. J. Selfridge, and R. Young. 2003. *Planning Geophysical Prove outs for Munitions Response Projects.* Huntsville, Ala.: U.S. Army Engineering and Support Center.

USAESCH (U.S. Army Engineering Support Center, Huntsville). 2003. Munitions Response Data Item Descriptions (DIDs). Revised 1 December 2003.

Project Specific Work Plan - Data Quality Objectives (DQO) with established metrics

Review/Revision Date:	J. Williams - 02/04/08
Original Prepared By/Date:	M. Saunders – 01/14/2008
Revision #1 –	

Photo 5-1 Four coil configuration of the EM61-MK2 Towed Array

APPENDIX E

Operational Use of the G-856 Magnetometer and Operational Use of the G-858/822 Magnetometer

WSI *POLICY AND PROCEDURE MANUAL*		
SUBJECT: Operational use of G-856 Magnetometer		**No**. Op.001.G856.mag
EFFECTIVE DATE: February 27, 2008		**SUPERSEDES:**
SECTION: Geophysics Group		**DEPARTMENT**: OU 1494
NAME/TITLE: J. Williams/Sr. Technical Manager		
SIGNATURE:		**DATE APPROVED:** March 10, 2008

1. PURPOSE

This procedure outlines the technical requirements and operational use of the G-856 Magnetometer for use in geophysical surveys.

2. APPLICABILITY AND SCOPE

The requirements of this procedure are applicable to all project activities which include the use of the G-856 Magnetometer. The instrument is utilized as a magnetic basestation to collect magnetic data used to diurnally correct the G-858 magnetometer data.

3. REFERENCES

   3.1. G-856 Magnetometer Operating Manual, Geometrics, Inc.

4. DEFINITIONS

   4.1. Central Equipment Stores (CES) - WESTON's central equipment storage location in West Chester, PA. This group is responsible for securing, maintaining, and distributing equipment.

   4.2. G-856 Magnetometer components:

      4.2.1. One proton-precession magnetometer

      4.2.2. One Geometrics data logging console

      4.2.3. Aluminum pieces to assemble data collection staff

      4.2.4. Optional external battery

      4.2.5. Download Cable

5. SET-UP AND OPERATION

This section outlines the steps for setting up the G-856 Magnetometer system in the field for the acquisition of monitoring daily magnetometer data.

5.1. Assemble G-856 Magnetometer according to operating manuals.

5.2. It is not necessary to perform a warm-up of the G-856.

5.3. Set-up the specific data collection software on the data collection console

5.3.1. Synchronize the G-856 and G-858 clocks within 1 second.

5.3.2. Set the appropriate data collection rate (sampling rate, i.e. 1 reading every 20 seconds is sufficient for collecting diurnal data).

5.3.3. Erase any previous data on the instrument in order to ensure enough room from the current data.

5.3.4. Start logging data on the G-858 console.

5.4. At the end of the day stop data collection and download data utilizing MagMap2000 software from Geometrics.

Applicable References:

Geometrics, 2000. Total *Field Magnetometer Performance Published Specifications and What They Mean*: Technical Report TR-120, Geometrics, San Jose, CA.

Geometrics, 2001. *G-856 Magmapper Operation Manual*.

Smith, K., 1997. *Cesium Optically Pumped Magnetometers*: Technical Report M-TR91, Geometrics, San Jose, CA.

USAESCH (U.S. Army Engineering Support Center, Huntsville). 2003. *Munitions Response Data Item Descriptions (DIDs)*. Revised 1 December 2003.

Project Specific Work Plan - Data Quality Objectives (DQO) with established metrics

Review/Revision Date:	J. Williams - 03/10/08
Original Prepared By/Date:	M. Saunders – 03/03/2008
Revision #1 –	

WSI *POLICY AND PROCEDURE MANUAL*		
SUBJECT: Operational use of G-858 Magnetometer		**No**. Op.001.G858.mag
EFFECTIVE DATE: February 27, 2008		**SUPERSEDES:**
SECTION: Geophysics Group		**DEPARTMENT**: OU 1494
NAME/TITLE: J. Williams/Sr. Technical Manager		
SIGNATURE:		**DATE APPROVED:** March 10, 2008

1. PURPOSE

This procedure outlines the technical requirements and operational use of the G-858 Magnetometer for use in geophysical surveys.

2. APPLICABILITY AND SCOPE

The requirements of this procedure are applicable to all project activities which include the use of the G-858 Magnetometer. The instrument is utilized to collect magnetic data from the subsurface up to a depth of four feet (unofficial estimate). The data generated are collected concurrently with a navigational system (RTK or total station) and stored on a Geometrics field computer.

3. REFERENCES

    3.1. G-858 Magnetometer Operating Manual, Geometrics, Inc.

4. DEFINITIONS

    4.1. Central Equipment Stores (CES) - WESTON's central equipment storage location in West Chester, PA. This group is responsible for securing, maintaining, and distributing equipment.

    4.2. G-858 Magnetometer components:

        4.2.1. Two Cesium magnetometer sensors

        4.2.2. One Geometrics data logging console

        4.2.3. Aluminum pieces to assemble data collection staff

        4.2.4. Battery pack

        4.2.5. Navigational mount

5. SET-UP AND OPERATION

This section outlines the steps for setting up the G-858 Magnetometer system in the field for the acquisition of geophysical data using a Global Positioning System (GPS). Be sure to follow all operating manuals for set-up and operation.

5.1. Assemble G-858 Magnetometer according to operating manuals.

5.2. Interface the G-858 Magnetometer with a navigational system for precise location data. Connect serial cable from navigational system into the RS-232 Port.

5.3. Perform 10-15 minute warm-up of G-858 Magnetometer according to ambient temperature. Check the magnetometer system settings to ensure "RF 1 & 2 and Bright 1 & 2 are reading within specified limits as per the values below:

RF should be below 60% - Optimum is 35%

Brightness should ALWAYS be 50% +/- 2%

COLD should always be 50% +/- 2%

Signal usually is about 25% but is dependent on the environment.

5.4. Measure distance between top and bottom sensors from center to center of each sensor (typically 1 meter, but project dependent). A pin flag affixed to the bottom sensor at the instrument height (determined from the height optimization test) allows the operator to maintain a constant height by using the pin flag as a guide.

5.5. Set-up the specific data collection software on the data collection console

5.5.1. Set the appropriate data collection rate (sampling rate, i.e. 10 Hz for MEC mapping).

5.5.2. The G-858 Magnetometer utilizes "Datasets" to store data. There are only five Datasets available.

5.5.2.1. Collect all QC data in Dataset 1.

5.5.2.2. Collect all Survey files in Datasets 2-5

5.5.3. Adjust line increments and stations start as needed per survey file.

5.6. Perform Pre-survey QC function tests (see separate QC SOP) which usually consists of a 2-3 minute Static Test (remain stationary with no object – record readings), Static Spike (remain stationary with a metallic object [i.e. 5-6 inch ½ diameter rebar] beneath coil – record readings), and 0.5-1 minute Cable Vibration

Test (remain stationary with no object moving cables – record readings). Note any spikes or abrupt changes in data.

5.7. Perform Latency Test – Magnetometer data does not exhibit latency effects as other instruments, but it is suggested that several latency test be run early in your project to verify and document this result.

5.8. If all QC data is verified, collect data, according to operating manual.

5.8.1. If a Geophysical Prove-out survey is required, data acquisition will be performed following the guidance established in the Site Specific GPO Work Plan.

5.8.2. For production surveys, data acquisition will be performed following the guidance established in the Site Specific Geophysical Investigation Plan (GIP).

<u>Applicable References:</u>

Geometrics, 2000. Total *Field Magnetometer Performance Published Specifications and What They Mean*: Technical Report TR-120, Geometrics, San Jose, CA.

Geometrics, 2001. *G-858 Magmapper Operation Manual.*

Smith, K., 1997. *Cesium Optically Pumped Magnetometers*: Technical Report M-TR91, Geometrics, San Jose, CA.

USAESCH (U.S. Army Engineering Support Center, Huntsville). 2003. *Munitions Response Data Item Descriptions (DIDs)*. Revised 1 December 2003.

Project Specific Work Plan - Data Quality Objectives (DQO) with established metrics

Review/Revision Date:	J. Williams – 03/10/08
Original Prepared By/Date:	M. Saunders – 03/03/2008
Revision #1 –	

APPENDIX F

Analog Locator Operations and Analog Locator Operator Checkout

<table>
<tr><td colspan="4">WSI
POLICY AND PROCEDURE MANUAL</td></tr>
<tr><td colspan="3">SUBJECT: Analog Locator Operations</td><td>No. Op.001.Analog Locator Operations.su</td></tr>
<tr><td colspan="2">EFFECTIVE DATE: February 29, 2008</td><td colspan="2">SUPERSEDES:</td></tr>
<tr><td colspan="2">SECTION: UXO Service Line</td><td colspan="2">DEPARTMENT:</td></tr>
<tr><td colspan="4">NAME/TITLE: J. Williams/Sr. Technical Manager</td></tr>
<tr><td>SIGNATURE:</td><td>John A Williams Jr</td><td colspan="2">DATE APPROVED: February 5, 2008</td></tr>
</table>

1. PURPOSE

This procedure outlines the requirements for analog locator operations.

2. APPLICABILITY AND SCOPE

The analog locator will be used during the following operations:

- Analog Locator Daily QC Checkout
- Analog Surveys ("mag and dig")
- Near-Surface Anomaly Detection
- Backhoe Excavations
- Final 10% Analog Locator QC Surveys

The following section provides descriptions of these operations.

3. OPERATIONS

Analog Locator Daily QC Checkout

The UXO Technicians will conduct a daily instrument standardization check by placing the instrument over a standard item prior to commencing daily field activities. The standard item will be buried with the item description, depth and orientation annotated on a wooden stake marking where the item is located. The standard item will remain in the same location until the block of grids has been completely investigated.

An Analog Locator Checkout and Return Form will be filled out daily by equipment operators to record the results of the analog locator QC checkout and document the condition of the equipment.

Analog Locator Surveys

Analog locator surveys (i.e., “mag and dig”) will be performed in areas that cannot be surveyed using the digital techniques. “Mag and dig” sweeps are particularly effective in areas where vegetation and terrain limit the use of larger digital systems. The “mag and dig” approach will also be used in areas where metallic fragments and debris make digital discrimination from MEC ineffective.

UXO Technicians will use the procedure described in Section 4.0 of this SOP to conduct analog locator surveys. The location of any MEC items that are located by using this method will be recorded with a GPS (or other survey method if under vegetation canopy) and all collected field data will be recorded in personal digital assistant’s (PDAs).

Near-Surface Anomaly Detection

Near-surface anomalies are those subsurface anomalies that can be excavated using hand tools. Throughout the excavation, the UXO Technician will use a magnetometer to check and verify the location of the anomaly.

Backhoe Excavations

Some anomalies are more deeply buried and require excavation using heavy equipment (i.e., backhoe). Prior to the arrival of the heavy equipment, the UXO Team Leader will ensure that a cleared entrance and egress path is available for the heavy equipment. Once on-site, the heavy equipment will be used to excavate the earth overburden from the suspect anomaly. The distance to the anomaly will be checked with the magnetometer during the excavation.

Final 10% Analog Locator QC Surveys

Quality control surveys will be performed after intrusive operations have been completed. A 10 percent QC survey will be performed by the UXOQCS using the analog instrument for all grids originally surveyed digitally. The discovery of any UXO or UXO-like item sufficient in size to represent a 37mm projectile or larger will constitute a failure of the grid (area) being investigated. Results of the 10 percent analog locator QC survey will be documented by the UXOQCS in the daily quality control (QC) report.

4.0 ANALOG LOCATOR SURVEY PROCEDURE

The following procedure will be used by equipment operators to conduct “mag and dig” operations with a handheld analog locator:

- The UXO Team Leader will direct personnel to establish individual search lanes approximately 3 feet wide and to begin searching each lane using a handheld analog locator.

- The equipment operator will start at one end of each lane and move forward toward the opposing baseline.

- During the forward movement, the UXO Technician will move the magnetometer back and forth in a sweeping motion from one side of the lane to the other. Both forward movement and the swing of the analog locator are performed at a pace that ensures that the entire lane is searched and that the instrument is able to appropriately respond to subsurface anomalies.

- Whenever a subsurface anomaly or metallic surface object is encountered, the technician will halt and investigate the anomaly or place a flag for later investigation. Throughout this operation, the UXO Team Leader will closely monitor individual performance to ensure these procedures are being performed with due diligence and attention to detail.

6.0 ANALOG LOCATOR QUALITY CONTROL REPORTS

The quality control reports and forms used to document the QC activities listed in this policy and procedure manual are as follows.

Review/Revision Date:	L. Temple - 01/22/08
Original Prepared By/Date:	S. Young – 01/14/2008
Revision #1 –	

FIELD SUPERVISOR REVIEW SHEET

I have read the Project Work Plan and Standard Operating Procedure (SOP) UXO Technicians Analog Locator QC Checkout. I understand it. To the best of my knowledge the processes described in the Work Plan and this SOP can be done in a safe, healthful, and environmentally sound manner. I have made sure all persons assigned to this process are qualified, have read and understand the requirements of the Work Plan and SOP, and have signed the worker's statement for this process. If necessary, I will conduct an annual review of the Work Plan and SOP. If deviations from this SOP are necessary, I will ensure that project activities are stopped until the SOP is revised and approved. If unexpected safety, health, or environmental hazards are found, I will ensure that project activities are stopped until the hazards have been eliminated.

SUPERVISOR'S NAME	SIGNATURE/DATE

FIELD TEAM REVIEW SHEET

Each field team member shall sign this section after site-specific training is completed and before being permitted to work on-site.

I have read the Project Work Plan and Standard Operating Procedure for UXO Technicians Analog Locator QC Checkout. I have received the hazard control briefing. I understand them. I will follow the Work Plan and SOP unless I identify a hazard not addressed in it or encounter an operation I do not understand. If that occurs, I will stop site activities and notify my immediate supervisor of the problem.

WORKER'S NAME (Print)	SIGNATURE/DATE	SUPERVISOR'S NAME	SIGNATURE/DATE

WESTON SOLUTIONS

ANALOG LOCATOR CHECKOUT AND RETURN PROCEDURE

Month ___________________________

Instrument___________________________

Serial No. ___________________________

Work Site ___________________________

Operator's Signature	Comments	Date	CHECKOUT PROCEDURE	Check case for damage; open case	Check instrument for damage	Open battery compartment	Install batteries	Audio switch in "A" position	Power up; adjust sensitivity control	Set volume control	Verify digital display	Report to test grid	Test grid results; Pass/Fail	RETURN PROCEDURE	Clean instrument	Open battery compartment	Remove and store batteries	Close battery compartment	Return instrument to storage case	Return case to storage area	
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WSI *POLICY AND PROCEDURE MANUAL*			
SUBJECT: Analog Locator Operator Checkout			**No**. Op.001.Analog Operator Checkout.su
EFFECTIVE DATE: February 29, 2008		**SUPERSEDES:**	
SECTION: UXO Service Line		**DEPARTMENT**:	
NAME/TITLE: J. Williams/Sr. Technical Manager			
SIGNATURE:		**DATE APPROVED:** February 5, 2008	

1. PURPOSE

This procedure outlines the requirements for analog locator operator checkout.

2. APPLICABILITY AND SCOPE

The Geophysical Test Plot will be used as the analog locator operator checkout area. The Geophysical Test Plot Plan identifies the approximate number and type of items buried in the test plot. Equipment operators must successfully locate the required number of targets prior to commencing field data collection.

3. TEST OPERATIONS AND REPORTING

Prior to collection of field data, each equipment operator will be certified in the established test plot. To achieve certification, each operator must demonstrate the ability to locate 85% of target items. The UXO Technician Analog Locator Qualification Form will be used to record the results of the test and will serve as a record of the individual's analog locator qualification history.

Failure to locate 85% of the items will require a root cause analysis. After corrective action, operators may be reprocessed through the test plot to demonstrate their ability to reach the required levels of detection.

Upon successful completion of the test, certification of the operators/equipment will be recorded by the UXOQCS on the Analog Locator Qualification Form and documented in the daily quality control (QC) report on the day that certification occurs.

Review/Revision Date:	L. Temple - 01/22/08
Original Prepared By/Date:	S. Young – 01/14/2008
Revision #1 –	

Attachment A

ANALOG LOCATOR QUALIFICATION FORM

Name:	Member ID:	Team #	Date:
Analog Locator Unit Serial Numbers: 1. 2.			

Item No.	Target Located?		Location of Target		Radial Error of Target Location (in)	Comments
	Yes	No	Northing (ft)	Easting (ft)		

UXOQCS Name:	Signature:	Date:

APPENDIX G

Quality Control Procedures and Geophysical Data Processing

<table>
<tr><td colspan="4">WSI
POLICY AND PROCEDURE MANUAL</td></tr>
<tr><td colspan="3">SUBJECT: Quality Control Procedures and Geophysical Data Processing</td><td>Op: 001.QC dat</td></tr>
<tr><td colspan="2">EFFECTIVE DATE: March 13, 2008</td><td colspan="2">SUPERSEDES:</td></tr>
<tr><td colspan="2">SECTION: Geophysics Group</td><td colspan="2">DEPARTMENT: OU 1494</td></tr>
<tr><td colspan="4">NAME/TITLE: J. Williams/Sr. Technical Manager</td></tr>
<tr><td>SIGNATURE:</td><td>John A Williams Jr</td><td colspan="2">DATE APPROVED: March 13, 2008</td></tr>
</table>

1. PURPOSE

This procedure outlines the technical requirements and procedures for geophysical data processing and basic QC metrics established for geophysical projects.

2. APPLICABILITY AND SCOPE

The requirements of this procedure are applicable to all project activities which include the use of the EM61-MK2 and G-858 magnetometer either single sensor or array configuration. The data processing steps and QC metrics outlined in this SOP require intermediate knowledge of Geosoft Oasis Montaj (main geophysical processing software used by Weston Solutions, Inc.)

3. REFERENCES

3.1. Oasis Montaj Manual version 6.4, 2008.

4. DEFINITIONS

4.1. Geosoft Oasis Montaj - WESTON's main processing software for all electromagnetic data and magnetometry data collected during field survey.

5. QUALITY CONTROL

This section outlines the basic concepts and techniques used to measure and process QC data. Table 5-1 illustrates the basic list of QC tests that are run at every project and the frequency in which they are to be performed. The tests will now be explained below.

5.1. Equipment Warm-up – All geophysical equipment must be warmed up for at least 5 minutes dependent on ambient temperature. This allows the sensors to regulate themselves.

5.1.1. For the Mag G-858 execute the SELF TEST "Magnetometer Test" to confirm that values for the Battery, Lithium, RF, Bright, Cold, and Signal are appropriate with normal warm up values documented in the Magmapper Ops Manual.

5.2. Record Sensor Positions – All sensor positions and navigation system offsets will be recorded daily on the field notes. This will allow the processing geophysicist to accurately locate all sensors in space.

Table 5-1 - QC Tests for Geophysical Surveys

Test Description	Acceptance Criteria	Power On	Beginning of Day	End of Day	1 Line per Day
Equipment Warm-Up	Equipment Specific (5-15 minutes)	**X**			
Record Sensor Positions	±1 inch (2.54 cm)		**X**		
Personnel Test	EM-61 2mVp-p, Mag 3nT p-p		**X**		
Vibration Test	Data profile does not exhibit spikes		**X**	**X**	
Static Background	Background: EM61-MK2 +/- 2.5 mV,		**X**	**X**	
Static Spike	20% of standard item response		**X**	**X**	
Repeat Data	Repeatable ±20% of response amplitude, ±20 cm for positional accuracy				**X**

Note: Static and cable Vibration Tests must be performed with the sensor in a fixed "static" position. It is recommended that a non metallic jig or stand be used for this procedure. It is imperative that the operator avoid moving or influencing the sensor during these tests.

5.3. Personnel Test – Operators of the equipment should check themselves for influence on the sensor readings by approaching the sensors and noting the readings before and after (operators should remove all metal from the person before running this test). This test does not need to be recorded but should be ran everyday to ensure the operator does not have any metallic items that may interfere with the survey (i.e. metal grommets on boots are a typical factor).

5.4. Vibration Test (Cable Test) – the operator collects data and moves cables and electronics to note any possible fluctuations (may indicate a broken wire or an electronic interference from some data loggers).

5.5. Static Background – the operator collects data for a period of 3 minutes over a background area. The purpose is to identify any variations in the collected signal. The amplitude should remain constant within +/- 2.5 mV for EM and 3 nT/m for MAG.

5.6. Static Spike - the operator collects data for a period of 3 minutes over a spike object (usually a 2 in. pipe or 2 in. trailer ball). The purpose is to identify any variations in the collected signal. The amplitude should remain constant within +/- 2.5 mV for EM and 3 nT/m for MAG.

5.7. Repeat Data – the operator collects data over a predetermined survey line (original line) and then collects a separate line over the same position (repeat line). The data is then compared and the repeat line must have an amplitude within 20% of the original line and navigational accuracy within +/- 20 cm. Note a QC repeat survey is different from a repeat line. Quality Control repeat surveys are a repeat of a predetermined portion of a survey area where the data is collected again and selected targets and processed results are compared. Quality Control repeat surveys are project specific requirements and not required for all surveys.

5.8. Height Optimization Test – this test is performed at the beginning of the project to determine the optimal operating height of the data collection instrument. The test is performed by measuring the response of a calibration object (usually the smallest item of interest at your site) and varying the depths of this object to determine the height that yields the highest signal to noise quality.

5.9. Instrument Specific Tests – there are several instrument specific tests associated with magnetometry that also need to be performed at the beginning of the project.

5.9.1. Azimuth Test – the test is performed if using the line and fiducial method and is performed by placing the sensor over a background area and rotating around this point in the cardinal directions and recording the results. The results are entered into a heading table and used to correct heading errors associated with affects from direction of survey.

5.9.2. Octant Test – the test is performed when the instrument is interfaced with a navigational system. A background spot is marked on the ground and the operator traverses in all cardinal directions (at least 10 feet on either side of the spot). The database is then analyzed and a heading correction table is automatically generated from the data.

6. DATA METRICS

6.1. Sample Rate – the sampling rate will be conducive to the target size expected. For example on MEC projects with small MEC a sampling rate of 10 Hz (hertz – samples/second).

6.2. Sample Separation – the sample separation will not exceed 0.5 feet along line. Sample separation is calculated through Oasis Montaj's Sample Separation Calculation tool. This tool creates a map and lets the processing geophysicist examine if sample separation metrics are exceeded.

6.3. Velocity – velocity less than 3.0 mph will be maintained at all times. Optimal velocity has been noted around 2.0-2.5 mph. Velocity is calculated through Oasis Montaj's Velocity Calculation tool. This tool creates a channel in the survey database and lets the processing geophysicist examine if velocity metrics are exceeded. Logging velocity can also be monitored during data collection when using MagLogNT and NavTrack61MK2.

6.4. Line Spacing – also know as across line spacing is the distance of one survey line to the previous survey line measured perpendicular (normal) to each other. The maximum line spacing allowed is 2 feet.

6.5. Navigation Accuracy – navigation accuracy will be checked and documented daily by using a known point. This accuracy check is performed during the latency test as the latency test already makes use of known items and the location. The location accuracy of the peak response after latency correction will be with 1 foot of the actual location.

6.6. Diurnal Correction – this correct applies specifically to magnetometry data. Diurnal data will be monitored separately using a BaseStation (G-856) to monitor the daily natural magnetic background fluctuations. The data are used to apply a correction to the collected total field data with the G-858 sensors. The correction removes the daily diurnal effects from the data and is applied during the export process of the magnetometry data.

6.7. Drift Correction – drift correction is applied to remove the fluctuation ("drift") in the instrument thought the survey. Instruments (especially the EM61-MK2) are noted to drift thought the day due to mainly temperature related issues in the day, which causes the electronics box to warm or cool affecting the response of the instrument. Drift is determined by using the no response signals (background – non amplitude signals) and applying a non-linear filter to the collected data, this filter can be changed to a zero-order trend, first order trend, second order trend removal, median or a combination of all the above. There are several ways to determine the drift of your survey. A statistical breakdown of your survey can be run illustrating the breakdown of your survey and will more adequately allow the processing geophysicist to determine drift parameters to apply. Collecting a “tie-line” in the field at the end of the survey. A tie-line is a separate line collected from the end of the survey (most recently collected data) perpendicular across the survey to the first survey line. This will allow the processing geophysicist to create a tie-line channel and use this data to run the drift correction.

6.8. Processing DQO statement - All drift correction and/or filtering routines that are applied to datasets will be evaluated, on a dataset by dataset basis, to confirm that those routines do not alter the nature of the original measured response. All data processing steps will be recorded in the database audit log or a separate data processing form.

6.9. EM61-MK2 Sum Channel – Weston utilizes a Sum Channel (sum of the individual drift corrected channel data 1-4) to grid datasets and select targets. Weston has noticed that by using the Sum helps to eliminate smaller noise induced targets.

6.10. Magnetic Analytic Signal – the analytical signal is a result of taking the X, Y, and Z derivative and using those grids to calculate the Analytic Signal grid. The Analytic Signal grid can be thought of the measured rate of change over an anomaly. It collapses dipole signatures to a single point (usually located at the inflection point) and is used to select targets.

7. TARGET SELECTION

Targets will be selecting using the 4 channel sum for Electromagnetic data and the analytic signal channel for magnetometry data.

7.1. Initial Target Selection Threshold – the initial target selection threshold will be determined using the GPO/Test Plot data and determining what threshold is needed to select the smallest MEC item at the detection depth for the instrument. After the initial target selection threshold is determined, that threshold must be used throughout the project. The threshold can be changed after digging has commenced and the threshold is deemed to low, a project meeting must take place with all decision makers present and supporting evidence presented to raise the threshold. The threshold cannot be changed unless all stakeholders in the project are in agreement.

7.2. Target Selection - the Project Geophysicist will perform an automatic anomaly selection based on the Stack or Analytic Signal channel using UX-Detect Blakely algorithm within Oasis Montaj and the agreed upon selection threshold. A review of decay profiles (for the appropriate channels in EM data) at all suspect and/or low-amplitude anomalies will be performed to remove anomalies from the list not exhibiting response characteristics typical of buried metallic objects. A manual review of the remaining anomalies will be conducted to center the anomaly response as needed. All corrected geophysical data and anomaly locations will be exported to a database according to DID guidelines.

8. TYPICAL DATA PROCESSING SCENERIO

8.1. Initial Field Processing - Initial field processing will include data file QC review and correction of the following:

8.1.1. File/Grid or mile mark identification and location

8.1.2. Precision of the navigational data – An initial QC check will be performed on data collected using a 2-Point Function Test, which will be conducted on the established QC site near the GPO grid at the beginning and end of each work day. This data will be reviewed on a daily basis for precision of the navigational field data relative to known, geo-referenced items.

8.1.3. Checking navigational data for comprehensive coverage – The data will be reviewed to locate gaps in survey coverage in the data set that may require additional fill-in.

8.1.4. Reviewing data sets and QC tests with respect to signal to noise levels and acceptance criteria.

8.1.5. Removal of data dropouts and spikes associated with interference sources.

8.1.6. Begin initial data processing after all QC tests have been deemed valid.

8.2. Data Processing

8.2.1. Gridded plots for sum of the EM time gates/channels (Stack channel) will be prepared and transposed on electronic site base maps. The plots will be used to mark the horizontal dimensions of subsurface anomalies using Oasis Montaj™ (UX-detect) geophysical software. The crew will perform a comprehensive data analysis as described above to produce digital target tables, target maps, and identify and evaluate all geophysical anomalies detected by the geophysical instrument. Initially, the project geophysicist will process and interpret the four channels conducting a collective review of the respective decay characteristics. A summation of appropriate channels will be performed and the Stacked or Analytic Signal data will be processed. The final output will include processed data for the Stack or Analytic Signal (based on signal-to-noise ration [SNR] statistics for the site) and will include an automatic/manual anomaly selection. The Oasis software database audit log will also be reviewed as part of the QC process.

8.3. Quality Control of Target Selection

8.3.1. A quality control of selected targets is performed by measuring selected targets over known QC points (usually grid corner spikes or implanted QC seeds within the grid)

9. <u>ANOMALY SELECTION</u>
Targets will be selecting using the Stack channel for Electromagnetic data and the analytic signal channel for magnetometry data.

9.1. Gridded plots for sum of the EM time gates/channels (Stack channel) will be prepared and transposed on electronic site base maps. For the Magnetometer data, grid plots of the vertical gradient, analytic signal or total field (as defined in the Work Plan) will be prepared and transposed on electronic site base map. The plots will be used to mark the horizontal dimensions of subsurface anomalies using Oasis Montaj™ (UX-detect) geophysical software. The crew will perform a comprehensive data analysis as described above to produce digital target tables, target maps, and identify and evaluate all geophysical anomalies detected by the geophysical instrument. Initially, the project geophysicist will process and interpret the four EM channels conducting a collective review of the respective decay characteristics. A summation of appropriate channels will be performed and the Stacked (EM) or Analytic (MAG) Signal data will be processed. The final output will include processed data for the Stack or Analytic Signal (based on signal-to-noise ration [SNR] statistics for the site) and will include an automatic/manual anomaly selection. The Oasis software database audit log will also be reviewed as part of the QC process.

9.2. Initial Target Selection Threshold – the initial target selection threshold will be determined using the GPO data and determining what threshold is needed to select the smallest MEC item at the detection depth for the instrument. After the initial target selection threshold is determined, that threshold must be used throughout the project. The threshold can be changed after digging has commenced and the threshold is deemed to low, a project meeting must take place with all decision makers present and supporting evidence presented to raise the threshold. The threshold cannot be changed unless all stakeholders in the project are in agreement.

9.3. Target Selection - the Project Geophysicist will perform an automatic anomaly selection based on the Stack or Analytic Signal channel using UX-Detect Blakely algorithm within Oasis Montaj and the agreed upon selection threshold. A review of decay profiles (for the appropriate channels in EM data) at all suspect and/or low-amplitude anomalies will be performed to remove anomalies from the list not exhibiting response characteristics typical of buried metallic objects. A manual review of the remaining anomalies will be conducted to center the anomaly response as needed. All corrected geophysical data and anomaly locations will be exported to a database according to Appendix C of the USACE DID guidelines.

9.4. Quality Control of Target Selection

9.4.1. A quality control of selected targets is performed by measuring selected targets over known QC points (usually grid corner spikes or implanted QC seeds within the grid).

10. PREPARATION OF TARGET DATA BASE AND DIG INFORMATION

10.1. Exporting Target Information – all targets that have passed geophysical manual review and are to be selected for reacquisition and digging must be exported with the necessary reporting information as mandated by the DID.

10.1.1. Reacquisition Sheets – reacquisition sheets are supplied to the reacquire team so targets can be tracked as they are reacquired in the field using the same navigational method used to collect the data.

10.1.2. Navigation Target Location File – a comma delimited file containing target ID, Northing, and Easting (in that order with no header info) to be uploaded into the navigation data collector for reacquisition.

10.1.3. UXOFast Upload File – a predefined formatted excel file that is used to upload targets to UXOFast.

10.1.4. Target Dig Map – map of the grid area (if the scale is applicable) showing target locations and name for aid in reacquisition and digging.

Applicable References:

USAESCH (U.S. Army Engineering Support Center, Huntsville). 2003. Munitions Response Data Item Descriptions (DIDs). Revised 1 December 2003.

Project Specific Work Plan - Data Quality Objectives (DQO) with established metrics

Table 1
Typical DQO for DGM
(Subject to Revision per Site Specific Work Plan)

Typical DQO Parameters		Typical Metric	How QC metrics are measured	Rationale
1	Standard deviation of background noise	EM - (summed channel) = i.e. <2 mV. Mag Analytic Signal	Run statistics on all data below a reasonable level (i.e. between 7 and 9 mV)	Decreased Noise=lower False Positives
2	Mean acquisition speed	= i.e. <2.5mph	Run statistics on velocity between points in each file (created a "velocity" channel)	To provide appropriate data density to resolve smaller items.
3	Along track measurements [Note : 1]	= i.e. <0.5ft, across track = i.e. <3 ft	Metric based on mean speed during GPO.	Lower speed = less "vibration" and system noise
4	Sum of positioning errors	= i.e. < 1 foot	Developed navigation test appropriate to sensors Control points AM track plots PM track plots	
5	Instrument Latency	No chevron patterns in interpretation maps	Evaluation (visual review) of gridded data.	To reduce duplication of and introduction of false positive anomaly selections
6	Consistency of processing parameters within a dataset	Identical for each channel within a dataset	Analyst applies common set of parameters (leveling and drift routine filters), for processing all channels within dataset.	All signals to undergo standardization to support anomaly prioritizations. [Note : 2]
7	Signal to noise variance	= i.e. < lesser of 5% or 5mV	Random review of 3 small (less than 100mV) and 3 large (greater than 100mV) anomalies per dataset	To compare preprocessed and final processed peak responses.
8	Automated anomaly selections based on sum of channels or AS.	Verify we maintained peak response characteristics in the event anomaly is ambiguous	All automated anomaly selections will be based on sum of all channels and reviewed by a geophysicist	1-To confirm low amplitude anomalies are not "processed-out" 2- To facilitate anomaly prioritization if needed.

	Typical DQO Parameters	Typical Metric	How QC metrics are measured	Rationale
9	Random anomaly review	Reacquisition = i.e. < 2 feet	A random sample of anomalies (i.e. 2 per acre) to be reacquired and confirmed.	To demonstrate anomaly reproducibility (random reacquisition) and anomaly detections (blind QA items), both to within 2 feet, the data would be defensible in supporting project objectives.
10	Placement of Blind seed item within the Grid.	Tests Detection and Selection of anomaly (i.e. within 2 feet of known location)	The QA geophysicist places blind seeds throughout the survey area at a rate of 1 per 2 acres.	To confirm quality of detection and accuracy/precision of navigation.

Note:
1- Some (team decision) flexibility is required, to allow gaps (over entire survey area) up to an acceptable limit relative to design metrics and stated objectives.
2- Some exceptions with complex data or parsed sections affected by cultural interference

Review/Revision Dates:	J. Williams - 02/04/08
Original Preparer/Date:	M. Saunders – 01/17/08
Revision #1 –	

APPENDIX H

Anomaly Reacquisition and Excavation Procedure

WSI POLICY AND PROCEDURE MANUAL	
SUBJECT: Anomaly Reacquisition and Excavation Procedure	**No**. Op.001.reacrev3
EFFECTIVE DATE: May 21, 2008	**SUPERSEDES:** Op.001.reacrev2
SECTION: Geophysics Group	**DEPARTMENT**: OU 1494
NAME/TITLE: J. Williams/Sr. Technical Manager	
SIGNATURE:	**DATE APPROVED:** May 21, 2008

1. PURPOSE

This procedure outlines the technical requirements and procedures for performing anomaly reacquisition and excavation of selected geophysical targets.

2. APPLICABILITY AND SCOPE

The requirements of this procedure are applicable to all project activities which include the excavation and investigation of selected geophysical targets.

3. REFERENCES

3.1. None

4. PROCEDURES

4.1. Target Anomaly Flagging

4.1.1. Upload of selected targets into navigational data logger as provided by the Geophysicist.

4.1.2. Set up the Real Time Kinematic (RTK) - Global Positioning System (GPS) in accordance with Weston Op.001.nav.rtk rev 1.

4.1.3. Perform instrument checkout in accordance with Weston Op.001.Analog Operator Checkout.su

4.1.4. Proceed to Control Point (i.e., Fort Ord 36) and verify the accuracy (offset less than 0.1 ft).

4.1.5. Using the dig sheet information proceed to reacquire the anomaly targets identified marking each location with a non-metallic flag bearing the unique target ID. (ie. SCA W130 - 12). Place the flag within 0.1 feet of the target coordinates as determined on the RTK..

4.1.6. The Unexploded Ordnance (UXO) Dig Team will use the appropriate hand held instrument, depending on the type of instrument used for the digital geophysical mapping survey (EM61-MK2 data – All Metals, G-858 data – Schonstedt to investigate an area 3 feet around each flag to confirm the anomaly response. The UXO Team will note any offset from the flag to the excavated anomaly or anomalies and log accordingly.

4.2. Excavation of Target Anomalies

4.2.1. Once the target anomalies are flagged as described in Section 4.1, the Dig Team will begin anomaly excavation activities.

4.2.2. The Dig Team will upload the selected target anomalies onto the Personal Digital Assistant (PDA) (UXOFast program).

4.2.3. The Dig Team will proceed to each flagged anomaly. One of the team members will bring up the Target ID on the UXOFast program to begin data collection.

4.2.4. The Dig team will excavate each anomaly location flag or the spray painted location.

4.2.5. Hand held instruments such as a Schonstedt or White will be used to assist the excavation work. The handheld instruments will be tested in the Geophysical Test Plot.

4.2.6. The excavation team will investigate all anomalies within 3 feet of the flag or spray painted location. Do not move the flag location in the event that multiple items are recovered from this area. Off-sets shall be measured from the original flagged location.

4.2.7. All anomalies will be identified and logged into the PDA running the UXOFast software.

4.2.7.1. Target characteristics logged include but are not limited to; Item type (Munitions and Explosives of Concern (MEC), Munitions Debris (MD), cultural debris, QC item), item description (concrete, practice grenade), offset from flagged location, weight of item, depth, hole cleared, comments, etc. Once the data is entered, SAVE the entry.

4.2.7.2. If the target anomaly is a MEC item, the Dig Team will notify the Senior UXO Supervisor who will then determine the course of action.

4.2.8. After logging an excavated item, the UXO techs will continue to sweep the anomaly location for additional items and arrive at two possible situations:

4.2.8.1. If no further items are found within the radius of the flagged location, the hole is considered completed (cleared).

4.2.8.2. If different, additional items are found they are logged under the same target but given a different suffix (-1, -2, -3, etc) and logged as described above.

4.2.8.2.1. The Dig Team will proceed with excavation and removal of buried debris to the depth required in order to clear the hole.

4.2.8.2.2. The Dig Team will remove all items from the excavation hole. Items will not be placed back into the hole even if they are not MEC-related.

4.2.8.2.3. If the hole cannot be cleared due to extensive debris or the presence of an in-place object (e.g., a pipeline), the hole will be logged as "Not Cleared" and the Dig Team will inform the Senior UXO Supervisor of this finding. The hole may be investigated at a later time using heavy equipment (such as a backhoe or dozer).

4.2.9. The Dig Team shall handle all items recovered based on the type as specified in the work plan and explosive safety submission (ESS).

4.2.10. The Dig Team will then spread the spoils/excavated dirt into a thin lift and check the material for the presence of metal debris using a Schonstedt and/or White handheld instruments. The excavation will not be backfilled until the spoils have been checked and verified not to contain MEC or other metal debris.

4.2.11. Once the spoils have been checked, the Dig Team will backfill the hole.

4.2.12. If no anomalies are found the Dig Team the flag will be left at the original location and note the anomaly location as a "No Contact". No Contacts will be reviewed by the Geophysicist and checked as part of the QC-1 process.

4.3. Common Questions Encountered During Digging Procedures

4.3.1. What if the UXO Techs come to a flag and their instrument response is outside the sweep radius?

4.3.1.1. The UXO tech will check to see if any additional flags are near the response they are detecting. If there is, that response is due to that other flagged location. If there are no additional flags then the Dig Team will log that item under the flag location in which they started and mark the offsets accordingly. The offset failure will be identified by the QC geophysicist and an examination of the geophysical data will be performed to identify the reason for the failure. The offset failure distance is anything outside 2 feet of the original flagged location. Note the target is only considered a failure if there are no items dug within two feet of the flagged location. If additional items are found outside the two foot radius they are not failures.

4.4. Download and review of Dig Data

4.4.1. Upon returning from the field the UXO techs will turn in all PDA's and the site geophysicist (or designated person) will "*Send*" all the logged data onto the SQL UXOFast server.

4.4.2. The Site Geophysicist will review all the data for consistency and check the agreement with geophysical data (does the logged item "make sense" with the amplitude of the target).

4.4.3. The UXO QC Specialist and Senior UXO Supervisor will review any targets identified to be MEC or MD and review the entry information for consistency and accuracy.

4.4.4. Upon completing the QC procedures the targets will be made viewable to all parties via Teamlink.

4.4.5. The following morning and prior to using the PDA's, the Geophysicist (or designated person) will "*Get*" all the tables for the PDA's in order to "*Sync*" all the units with the same information.

Review/Revision Date:	J. Williams – 6/23/08
Original Prepared By/Date:	M. Saunders – 3/14/08
Revision #3	

APPENDIX F

Residential Quality Assurance Pilot Study

Appendix F: Residential Quality Assurance Pilot Study Work Plan

DRAFT FINAL
Group 1 Remedial Investigation / Feasibility Study Work Plan

Volume 2 - Sampling and Analysis Plan

Parker Flats Munitions Response Area Phase II

Former Fort Ord
Monterey County, California

November 13, 2008

Prepared for:

FORT ORD REUSE AUTHORITY

100 12th Street, Building 2880
Marina, California 93933

Prepared Under:

Environmental Services Cooperative Agreement
No. W9128F-07-2-01621
and
FORA Remediation Services Agreement (3/30/07)

Document Control Number: 09595-08-086-005

Prepared by:

LFR

WESTON SOLUTIONS

Westcliffe Engineers, Inc.

CONTENTS

ACRONYMS AND ABBREVIATIONS

BADT	Best Available (and Appropriate) Detection Technology
CSUMB	California State University Monterey Bay
CTS	California Tiger Salamander
DGM	digital geophysical mapping
DTSC	Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
ESCA	Environmental Services Cooperative Agreement
ESCA RP	Environmental Services Cooperative Agreement Remediation Program
FORA	Fort Ord Reuse Authority
MEC	munitions and explosives of concern
MRA	Munitions Response Area
QA	quality assurance
QC	quality control
RI/FS	Remedial Investigation/Feasibility Study
RQA	Residential Quality Assurance
SUXOS	Senior Unexploded Ordnance Supervisor
UXO	unexploded ordnance

F-1.0 INTRODUCTION

During development of the Environmental Services Cooperative Agreement (ESCA) for the Fort Ord Reuse Authority (FORA), the U.S. Environmental Protection Agency (EPA) and the Department of Toxic Substances Control (DTSC) expressed concern with the adequacy of the Best Available (and Appropriate) Detection Technologies (BADT) and related processes to remove munitions and explosives of concern (MEC) to the point that land could be released for residential use. This concern was attributed to the potential for small, but possibly hazardous items to remain at depths below the capability of instrument detection and close enough to the surface to pose a threat to future residents and/or land users.

In an effort to satisfy these concerns, a conceptual process was developed that would allow the project stakeholders to gain comfort with the acceptability of a parcel for residential use, hereinafter referred to as the Residential Quality Assurance (RQA) process.

As specified in the ESCA, FORA and their response contractor were tasked to develop a 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 RQA process is presented on Figure F-1. The following sections of this work plan address the scope of the RQA Pilot Study.

F-1.1 Test Area Selection and Location

There are approximately 690 acres of land identified for residential development within the ESCA Areas Covered by Environmental Services; 360 of the 690 acres are located in the Seaside Munitions Response Area (MRA) and 48 of the 690 acres are located in the California State University Monterey Bay (CSUMB) Off-Campus MRA.

Two test areas have been identified and are proposed for the RQA Pilot Study, as shown on Figure F-2 for the Seaside MRA and Figure F-3 for the CSUMB Off-Campus MRA. In accordance with the ESCA, the RQA study areas acreage is within 100 acres. In choosing the areas to include in the pilot study, the following selection criteria were developed:

- located within a future residential parcel
- varying types of approaches and instruments used in initial munitions response actions
- varying densities of MEC removed
- varying MEC hazard classifications
- varying MEC removal depths
- minimizing disturbance in designated California Tiger Salamander (CTS) habitat areas

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 (Figure F-2). The Seaside MRA is wholly contained within the jurisdictional boundaries of the City of Seaside.

The CSUMB Off-Campus MRA is located in the north-central portion of the former Fort Ord, bordered by Inter-Garrison Road to the north, the County North MRA to the east and southeast, Parker Flats MRA to the south, and CSUMB campus property to the west and southwest (Figure 3). The CSUMB Off-Campus MRA is wholly contained within the jurisdictional boundaries of Monterey County.

RQA Pilot Study areas within the Seaside and CSUMB Off-Campus MRAs are shown on Figures F-2 and F-3, respectively.

F-1.2 Purpose and Scope

The purpose of this RQA Pilot Study Work Plan is to define the procedures, methods, and resources that will be used to complete the RQA Pilot Study. The purpose of the RQA Pilot Study is to employ the RQA process on specific residential areas to evaluate whether or not the value added/risk reduction associated with the RQA process justifies the additional time and cost required. Results and conclusions of the RQA Pilot Study will be documented in a Technical Memorandum.

Upon completion of the RQA Pilot Study, EPA and DTSC will determine if continuation of the process is warranted on other residential parcels or portions of parcels, based upon the results of the RQA Pilot Study. The regulatory agencies' decision will be documented and entered into the administrative record.

F-1.3 Success Criteria

The ESCA specifies that "The 'success criteria' should be established prior to commencing the cleanup efforts on approved 'test' parcels." Considering the objectives of the RQA Pilot Study, the process will be considered "successful" if it:

- increases the level of confidence in the ability of the MEC removal activities to meet remediation goals
- demonstrates the effectiveness of the MEC remediation activities with respect to explosive hazard risk to future residential users
- can be implemented in a technically defensible manner and the cost of implementation is quantifiable

If the RQA Pilot Study is found to be successful, it is expected that the MEC remediation, quality control (QC), and quality assurance (QA) processes may be revised to include a more rigorous protocol, such as that employed in the RQA Pilot Study on the ESCA parcels designated for residential development. If the RQA Pilot Study is found to be unsuccessful, the existing MEC remediation, QC, and QA processes will generally be sustained in compliance with the terms of the ESCA and the Administrative Order on Consent.

Specific conditions of each of the three success criteria are outlined in the following subsections.

F-1.3.1 Level of Confidence

At the conclusion of the remediation activities specified in the Group 1 Remedial Investigation/Feasibility Study (RI/FS) Work Plan, the Group 1 MRAs will have been subjected to rigorous physical investigation, data analysis, hazard identification, hazard removal, and site restoration. Integrated into this process is an extensive process of QC and QA to provide a level of confidence that the remediation activities have been effective at meeting the project remediation goals. Because of the risks involved with residential land use, it is the obligation of the regulatory agencies to ensure optimal confidence in the remediation, QC, and QA processes relative to site conditions and current technology. Implementation of the RQA Pilot Study is intended to identify if the existing remediation, QC, and QA processes employed provide optimal confidence or if the QA protocol should be revised to include a more rigorous process, such as that employed in the RQA Pilot Study.

The impact of the RQA Pilot Study on the level of confidence will be assessed using standard statistical methods and/or models that are designed to specifically assess this parameter.

F-1.3.2 Explosive Hazard Risk

Similar to the rationale for the level of confidence discussed above, implementation of the RQA Pilot Study is intended to identify if the existing remediation, QC, and QA processes employed were sufficient to identify and remove explosive hazards on property proposed for residential use or if the QA protocol should be revised.

The degree of explosive hazard risk reduction will be assessed using industry explosive hazard risk reduction analysis and models to process the data obtained during the RQA Pilot Study. Specific emphasis will be placed on the hazard classification and the distribution and density of items found, if any. In addition, if items are discovered, an analysis will be conducted to ascertain the reasons that the items were missed in the initial remediation, QC, and QA efforts.

F-1.3.3 Technical Implementability and Cost

The third criterion is to demonstrate that the activities for the RQA Pilot Study can be implemented at the Site such that the goals can be accomplished and the cost of implementation can be quantified. Specifically, the implementation of the RQA Pilot Study will generate data that can be used to identify remediation, QC, and QA protocol adjustments, if any, necessary to achieve the level of confidence and explosive hazard risk reduction desired. At a minimum, data will include:

- historical site information, method previously cleared, weapons employed, etc.
- anomaly characteristics, such as depth density condition, hazard class, signal response, etc.
- implementation costs for equipment, labor, subcontractors, short- and long-term site management costs, sifting, stockpiling, etc.
- field conditions and challenges (and any related cost impact) encountered during implementation of the RQA Pilot Study activities

F-1.4 Document Structure

This RQA Pilot Study Work Plan is presented in numbered sections and figures. This Work Plan is not intended to be a stand-alone document. Sections 3, 4, 6, 7, 8, 9, 10, 11, and 12 in their entirety from Volume 2 of the Group 1 RI/FS Work Plan will be used to perform the work. Portions of Section 5 of Volume 2 of the Group 1 RI/FS Work Plan are referenced within this work plan, as appropriate.

F-2.0 TECHNICAL MANAGEMENT PLAN

F-2.1 RQA Pilot Study Test Areas

As indicated in the table provided below, the test areas for the RQA Pilot Study include one portion of the future residential land in the Seaside MRA (RQA-SEA.4) and a portion of the future residential land in the CSUMB Off-Campus MRA (RQA-CSUMB), as shown on Figures F-2 and F-3, respectively. During the initial munitions response activities, analog mag-and-dig (Schonstedt G52-CV) was the investigation approach used in the RQA test areas for the CSUMB Off-Campus MRA and a combination of digital geophysical mapping (DGM; EM61-MK2) and analog mag-and-dig (Schonstedt G52-CV) was the investigation approach used in the RQA test area for the Seaside MRA. Based upon the data obtained during the initial munitions response activities, and as illustrated on Figures F-2 and F-3, each area chosen for inclusion in the RQA Pilot Study exhibited varying densities of MEC with a variety of hazard classifications. Munitions smaller than 40 millimeters in size were recovered between 6 and 18 inches below ground surface on the Seaside MRA and at unknown depths on the CSUMB Off-Campus MRA. For the Seaside MRA, this depth interval is on the edge of the detection capability (both the EM61-MK2 and the Schonstedt) for these relatively small munitions. The three test areas also include portions of the MRAs where no MEC were encountered during previous munitions response actions, which will help to validate the effectiveness of initial response actions. In addition, designated CTS habitat areas were avoided when selecting these test areas.

Test Area	MRA	Acres (approx.)	Initial Munitions Response Approach / Equipment
RQA-SEA.4	Seaside	18.6	DGM / EM61-MK2; Mag-and-Dig / Schonstedt G52-CX
RQA-CSUMB	CSUMB Off-Campus	TBD	Mag-and-Dig / Schonstedt G52-CV

TBD = To Be Determined

F-2.2 Field Operations

The following are the major tasks that will be implemented in order to accomplish the overall objectives of the RQA Pilot Study:

- Site Preparation (Section F-2.2.1)
  - Preparatory Inspection (Section F-2.2.1.1)
  - Boundary Surveys for RQA Pilot Study Test Areas (Section F-2.2.1.2)
  - Brush Cutting and Removal (Section F-2.2.1.3)
  - Clearing and Grubbing (Six-Inch Scrape; Section F-2.2.1.4)
- Digital Geophysical Mapping Surveys (Section F-2.2.2)
- Anomaly Reacquisition (Section F-2.2.3)
- Excavation of Anomaly Targets (Section F-2.2.4)
- Site Restoration (Section F-2.2.5)

F-2.2.1 Site Preparation

The following activities will be conducted to prepare the test areas in advance of RQA Pilot Study activities:

- preparatory inspection
- boundary surveys and staking activities
- vegetation cutting and removal to the extent possible
- clearing and grubbing

F-2.2.1.1 Preparatory Inspection

A preparatory inspection of the test area will be performed before starting operations. Some boundary survey work may need to be conducted prior to the formal preparatory inspection to assist in delineation of the test areas to be inspected.

The purpose of this inspection is to determine what site preparatory measures are needed. This preparatory inspection is also used to identify environmentally sensitive areas, degree of vegetation present, and restoration requirements.

F-2.2.1.2 Boundary Surveys

Once the preparatory inspection is completed and prior to beginning vegetation cutting activities, the test area boundaries will be established with survey markers. Survey teams will work under the direction of the Senior Unexploded Ordnance Supervisor (SUXOS). An unexploded ordnance (UXO) escort will not be required during these activities.

Once clearing and grubbing is completed and prior to DGM survey activities, the surveyors will establish and stake 100-foot by 100-foot grids and partial grids within each test area in accordance with the grid system previously established for the former Fort Ord. These markers will provide a frame of reference during DGM investigations.

Survey work in the test areas will be based on monuments previously established in the field. The coordinate system to be used for control points and other survey activities is North American Datum 83 California State Plane Zone IV.

F-2.2.1.3 Vegetation Cutting and Removal

Vegetation will be cut and debris will be removed from the test areas. Tree removal will be minimized to the extent feasible. Subcontracted brush removal teams will conduct vegetation removals utilizing manual brush cutting and mechanical vegetation removal equipment. An UXO escort will not be required during vegetation cutting in areas that have been previously cleared by the United States Department of the Army. Brush cutting teams will work under the direction of the SUXOS and in coordination with the Field Biologist.

The brush cutting teams will be equipped with brush-clearing machines, power chippers, powered weed cutters, chainsaws, and a variety of hand tools. Each brush cutting team will have a leader or foreman that will ensure that personnel engaged in brush cutting activities wear personal protective equipment and accessories appropriate for the equipment being operated (e.g., chainsaw chaps).

F-2.2.1.4 Clearing and Grubbing (Six-Inch Scrape)

Approximately six inches will be removed from the existing ground surface within the RQA test areas. The intent of the clearing and grubbing is to 1) remove potential interference associated with the vegetative layer and 2) create a new ground level that will bring smaller subsurface items, that may have been previously undetectable, approximately six inches closer to the newly exposed surface; therefore, bringing them to a detectable depth. UXO construction support will be used during clearing and grubbing.

The six-inch layer will be removed from each test area and stockpiled within the MRA. No stockpiled soil will be removed from the ESCA property during the RQA Pilot Study, or used within a residential reuse area, without the prior written permission of EPA and DTSC.

F-2.2.2 Digital Geophysical Mapping Surveys

The newly exposed ground surface will be geophysically investigated using the BADT instrumentation. Standard DGM-quality process checks will be conducted throughout the RQA process, including by FORA's Quality Assurance Oversight Professionals, to ensure established processes and procedures are being followed and that the highest quality data possible is being collected.

The purpose of the DGM survey will be to establish and record the locations of geophysical anomalies that could potentially represent subsurface MEC. The digital geophysical survey methodology is detailed in Section 5 (Geophysical Investigation Plan) of Volume 2 of the Group 1 RI/FS Work Plan.

QC and QA activities will not include redoing DGM surveys or analog QC or QA inspections.

F-2.2.3 Anomaly Reacquisition

Anomaly reacquisition methodology is detailed in Section 5 (Geophysical Investigation Plan) of Volume 2 of the Group 1 RI/FS Work Plan.

F-2.2.4 Excavation of Anomaly Targets

Excavation methodology is detailed in Section 5 (Geophysical Investigation Plan) of Volume 2 of the Group 1 RI/FS Work Plan.

F-2.2.5 Site Restoration

There are no requirements to implement restoration measures. However, the test areas will be periodically monitored for erosion and invasive weeds. Erosion and/or weed mitigation measures, such as reseeding or soil stabilizing applications, will be implemented in coordination with the Field Biologist, if determined to be necessary.

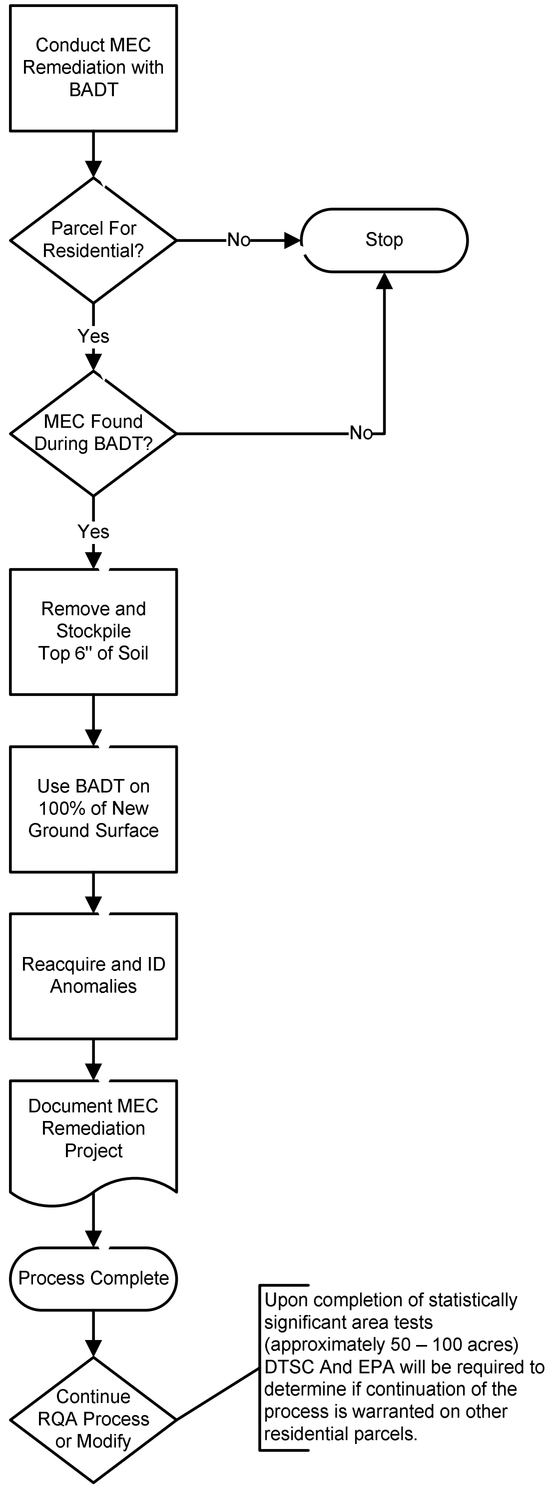
F-2.3 RQA Pilot Study Reporting

A Technical Memorandum will be prepared that documents the RQA Pilot Study field activities, data analysis, and evaluation. Complete reporting of data collected will include, but not be limited to, the following:

- historical site information, such as method cleared, weapons employed, etc.
- anomaly results, such as type, depth, density, condition, hazard classification, etc.

- implementation costs and timing (including erosion and weed control)
- implementation issues or field changes

The Technical Memorandum will also include an evaluation of the RQA Pilot Study success and provide RQA implementation alternatives and adjustments.



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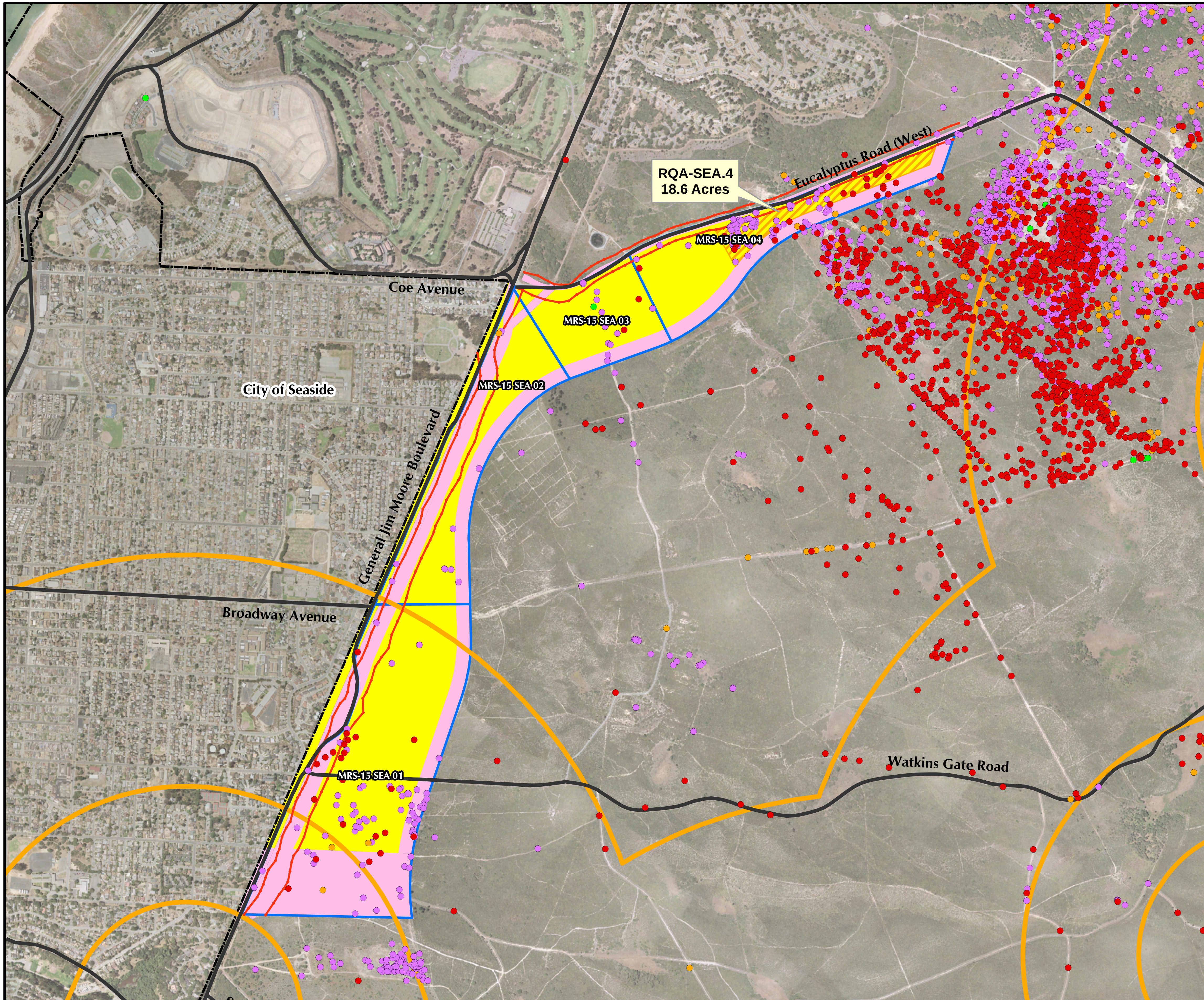
RQA Process Flow Diagram

FORA ESCA RP
Monterey County, California

Figure F-1

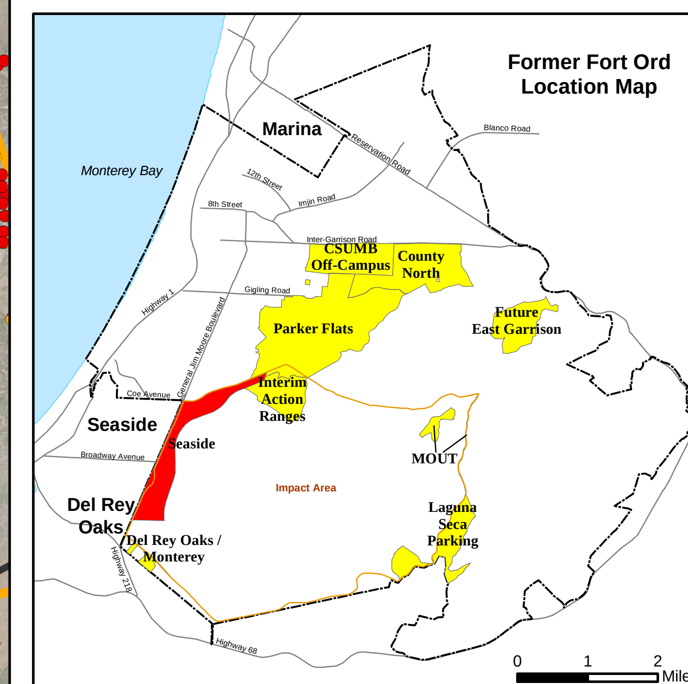


Legend

- Seaside MRA
- Munitions Response Site
- Major Road
- California Tiger Salamander Buffer
- Former Fort Ord Boundary
- Roadway Alignment
- Residential Land Use
- Non-Residential Land Use

MEC Hazard Classification

- 0 Inert munitions item that will cause no injury
- 1 MEC that will cause an injury or, in extreme cases, could cause major injury or death to an individual if functioned by an individual's activites
- 2 MEC that will cause major injury or, in extreme cases, could cause death to an individual if functioned by an individual's activites
- 3 MEC that will kill an individual if detonated by an individual's activites



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Seaside MRA
RQA Pilot Study Area

FORA ESCA RP
Monterey County, California

Figure F-2

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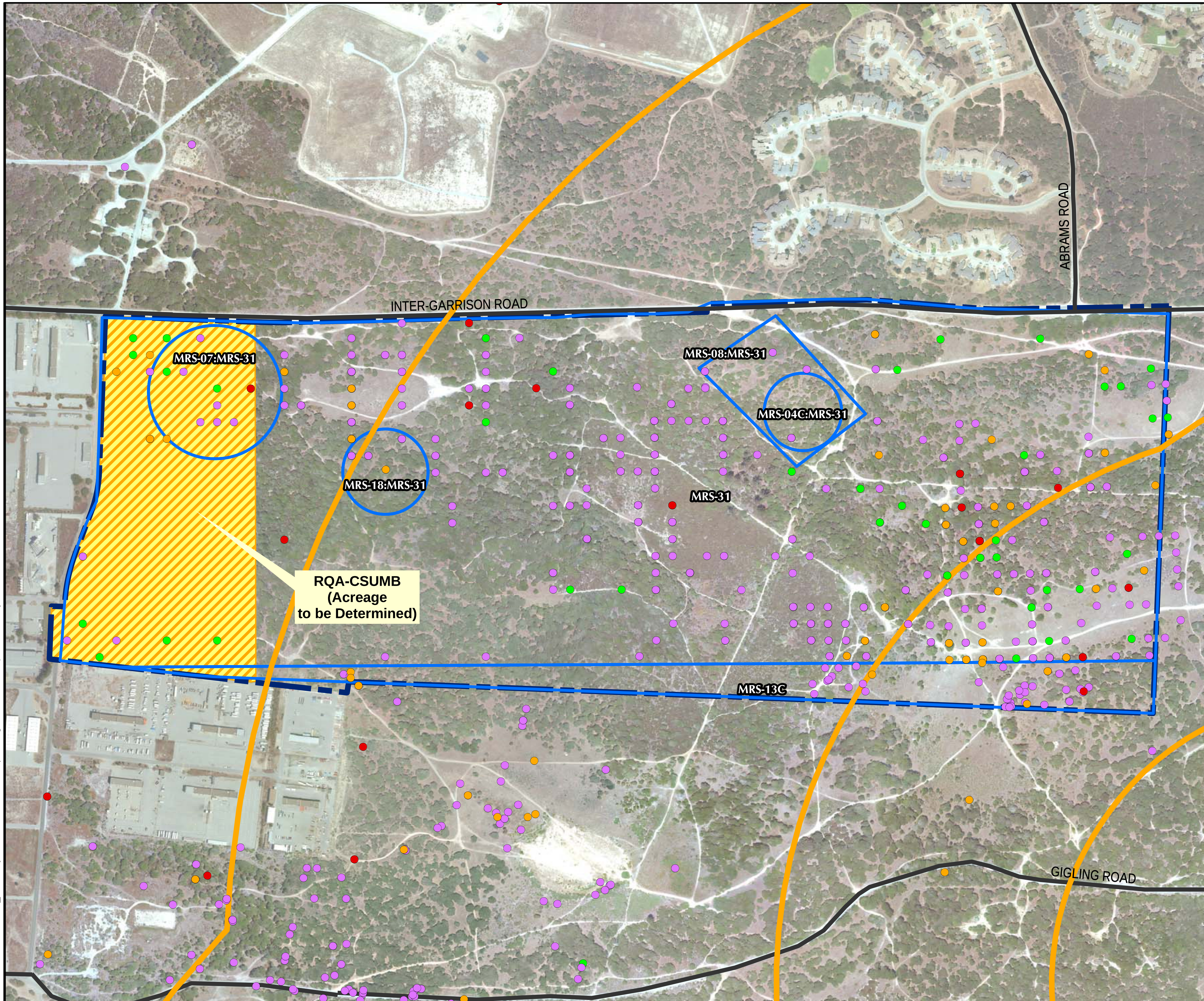
H:\TechStaff\036\095956_GIS\Projects\CSUMB\G1 Workplan Figure CSUMB RQA Pilot Study Areas.mxd - 11/14/2008 @ 4:45:04 PM

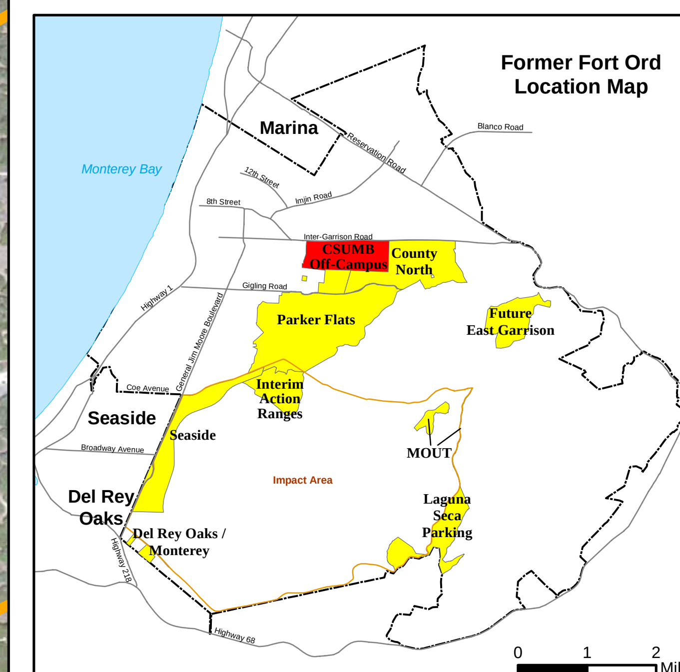


Legend

- CSUMB MRA
- Munitions Response Site
- Major Road
- California Tiger Salamander Buffer
- Residential Land Use

MEC Hazard Classification

- 0 Inert munitions item that will cause no injury
- 1 MEC that will cause an injury or, in extreme cases, could cause major injury or death to an individual if functioned by an individual's activites
- 2 MEC that will cause major injury or, in extreme cases, could cause death to an individual if functioned by an individual's activites
- 3 MEC that will kill an individual if detonated by an individual's activites



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CSUMB MRA
RQA Pilot Study Areas

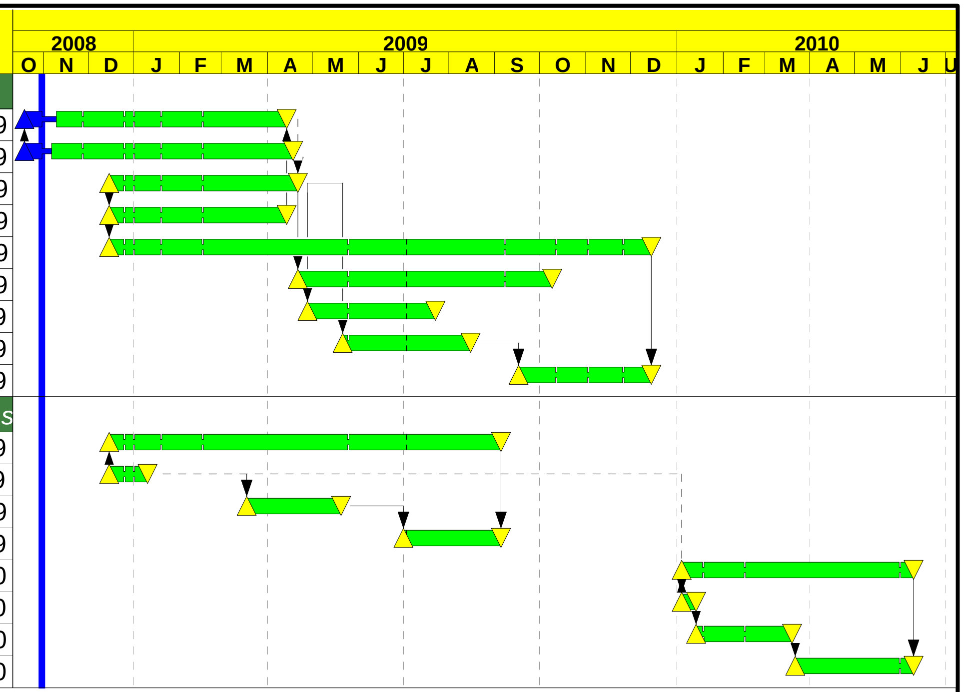
FORA ESCA RP
Monterey County, California

Figure F-3

APPENDIX G

Anticipated Fieldwork Schedule

Activity Description	Duration	Early Start	Early Finish
MEC Clearance Activities - Parker Flats MRA Phase II			
Boundary and Grid Surveys	116	20OCT08	13APR09
Vegetation Cutting and Removal	121	20OCT08	17APR09
Surface MEC Removal	87	15DEC08	20APR09
Demolition Activities	82	15DEC08	13APR09
Quality Control - Analog	251	15DEC08	14DEC09
Quality Control - Digital	120	21APR09	08OCT09
DGM and Data Analysis	60	28APR09	22JUL09
Subsurface MEC Removal; Reacquisition & Identification	60	21MAY09	14AUG09
Subsurface MEC Removal; Mag and Dig	60	17SEP09	14DEC09
Residential Quality Assurance (RQA) Activities - Seaside and CSUMB Off-Campus MRAs			
RQA - Seaside MRA	184	15DEC08	04SEP09
Pilot Test (RQA-SEA.4)	18	15DEC08	09JAN09
Agency Consultation	45	18MAR09	19MAY09
Remaining RQA, if required	47	01JUL09	04SEP09
RQA - CSUMB Off-Campus MRA	109	04JAN10	08JUN10
Pilot Test (RQA-CSUMB)	8	04JAN10	13JAN10
Agency Consultation	45	14JAN10	19MAR10
Remaining RQA, if required	56	22MAR10	08JUN10



Start Date	01APR07
Finish Date	14JUL14
Data Date	31OCT08
Run Date	10NOV08 13:50

Early Bar
Progress Bar
Critical Activity

1031

Sheet 1 of 1

FORA ESCA Remediation Program
Anticipated Fieldwork Schedule

Date	Revision	Checked	Approved

APPENDIX H

Resumes of Key Personnel

BRUCE M. MOE

Qualifications Summary

- Over 21 years of experience in the UXO and environmental industries.
- Experienced Project Supervisor, managing UXO response projects.
- Experience in UXO geophysical techniques including magnetics, frequency and time domain electro-magnetics.
- Unexploded ordnance (UXO) analysis, handling, and disposal.
- Certified USN Diver
- Experience in handling Chemical Warfare Materials and disposal.
- Class "A" CDL with HAZMAT endorsement
- First Aid/CPR Trained
- Level III Radiation Worker Certified

Registration

USACE Certified UXO Technician (No. 1065)

Fields of Competence

UXO and CWM response projects, all phases.

Plans, coordinates, and supervises most aspects of an OE response. Versed in the preparation and execution of plans, procedures and project documentation, while ensuring compliance with DOD Directives, as well as local, state and federal statutes, codes and regulations. Experienced in site management and supervision of multiple field teams, ensuring compliance with project plans and objectives while accomplishing tasks in a safe manner.

Can perform all tasks for any level UXO Technician, including:

- Reconnaissance and classification of UXO; identification of U.S. and foreign guided missiles; bombs; projectiles; grenades; rockets; land mines; fuzes; pyrotechnic items; military explosives and demolition materials.
- Location of subsurface UXO using geophysical equipment.
- Excavation and recovery of subsurface UXO
- Construction of UXO-related protective works
- Transporting and storing UXO assuring compliance with Federal, state, and local laws;
- Disposal of UXO
- UXO Safety and Quality oversight and inspections
- Handling, certification and disposition of scrap material
- Emergency leak sealing and packaging of chemical warfare material.

Credentials

US Navy EOD Basic School – 1984
US Navy Dive School – 1984
40-Hour Hazardous Waste Site Training Course, OSHA 29 CFR 1910.120(e)(3), (1984)
10-Hour Construction Safety Course OSHA 29CFR 1910.12

Employment History

2003 - Present WESTON
1988 - 2002 UXB International, Inc.
1982 - 1987 Active Duty, US Navy

Key Projects

UXO Clearance and Support Projects

- Avon Park AFR, FL – UXO Specialist
- Bellows AFS, HI – Sr. UXO Supervisor
- Camden Industrial Facility – Sr. UXO Supervisor
- Naples, Italy – Sr. UXO Supervisor
- Ft. Devons, MA – Sr. UXO Supervisor
- Schofield Barracks, HI – Sr. UXO Supervisor
- Aleutian Islands, AK – Sr. UXO Supervisor
- KI Sawyer Army Depot, MI – Sr. UXO Supervisor
- Umatilla Army Depot, OR – Sr. UXO Supervisor
- Fort Jackson, SC – Sr. UXO Supervisor
- Canoga Park, CA – Sr. UXO Supervisor
- Former Buckley Bombing Range, CO – UXO Specialist
- Fort Carson, CA – UXO Specialist
- Fort Irwin, CA – UXO Specialist
- Camp Stanley, TX – UXO Specialist
- Susanville Army Depot, CA – Sr. UXO Supervisor
- Savanna Army Depot, IL – Sr. UXO Supervisor
- Fort Meade, MD – UXO Supervisor
- Blossom Point, MD – UXO Specialist
- Fallon Naval Air Base, NV – UXO Specialist
- Sarcee Range, Calgary, Canada – UXO Specialist
- Kahoolawe Island, Hawaii – LOADS Supervisor
- Nevada Test Site, Mercury, Nevada-Senior UXO Supervisor
- Former Tobyhanna Artillery Ranges, Tobyhanna, PA- Senior UXO Supervisor

Key Projects (Continued)

- Surf City, New Jersey-Senior UXO Supervisor

CWM and UXO Projects

- MMD-1 CWM Destruction System, Dugway Proving Grounds, UT – UXO/CWM Site Supervisor
- Aberdeen Proving Grounds, MD – UXO/CWM Specialist
- Range Clearance, Dugway Proving Grounds, UT – UXO/CWM Specialist

Underwater UXO Projects

- Fort Hood, TX – UXO Specialist, Diver
- Denmark – UXO Specialist, Diver

Demining and UXO Projects

- Bosnia-Herzegovina – UXO/Demining Specialist

UXO/MEC Sifting Operations

- Chino Hills, California – Senior UXO Supervisor
- Mare Island, California- Senior UXO Supervisor
- NWS Earl, New Jersey- Senior UXO Supervisor

DONALD JOSEPH KEAN

Qualifications Summary

- Over 17 years of professional experience.
- Over 17 years of EOD/UXO experience including 11 years of active duty military impact/demolition range operations as an EOD/mine-warfare/demolitions instructor, performing UXO, mine, booby-trap search, detection, identification, clearance, and disposal operations.
- Eight years of civilian UXO industry experience.
- UXO Operations Supervisor and Quality Control Supervisor.

Registration

UXO Certification, USACE Huntsville Center (No. 1581)
Certified EOD Technician, Canadian Military (1990)
Certified EOD Technician Phase I and II, U.S. Navy EOD School (1996)

Fields of Competence

Supervision of chemical warfare munitions (CWM)/munitions and explosives of concern (MEC) project; unexploded ordnance (UXO) Quality Control (QC) Supervisor; high hazard remediation; supervisor for site excavation, removal, and disposal; range clearance and disposal operations; explosive ordnance disposal (EOD) Senior Unexploded Ordnance Supervisor (SUXOS) high hazard remediation operations.

Education

Graduate, Canadian Forces EOD School, Borden, Ontario, Canada (1990)
Graduate, U.S. Navy EOD School Phase I, Eglin AFB, FL (1996)
Graduate, U.S. Navy EOD School Phase II, Indian Head, MD (1996)

Credentials

40-Hour Hazardous Waste and Emergency Response Operations Course, OSHA 29 CFR 1910.120(e)(3), (2001)
Kaho'olawe Island Restoration Project, UXB International
8-Hour Hazardous Waste Refresher Course, OSHA 29 CFR 1910.120(e)(8), WESTON (2007)
RCRA Generator, OSHA 40 CFR 262.34 and 265.16, WESTON (2007)

Employment History

2006-Present	WESTON
2006	Zapata Engineering, Inc.
2006	Environmental Chemical Corporation
2005-2006	Zapata Engineering, Inc.
2004-2005	USA Environmental, Inc.
2001-2004	UXB International, Inc.

Employment History (Continued)

2000	European Landmine Solutions
1996-2000	Canadian Forces School of Military Engineering
1989-1996	Canadian Army, Various Tours of Duty

Key Projects

High Hazard Remediation Operations, City of Vallejo, CA, Mare Island Naval Shipyard, UXO Technician 3, SUXO and QC. Performed remedial investigation (RI), detection, identification, and removal of potentially hazardous UXO items at Mare Island Naval Shipyard.

Munitions Response/Construction Support Work, Schofield Barracks Cleanup Project, Oahu, HI, U.S. Army, UXO Technician 3. Responsible for daily team safety briefings, search, detection, and identification of munitions and explosives of concern (MEC) and chemical warfare munitions (CWM) items during surface and subsurface detection. Also responsible for the inspection and removal of ordnance scrap and range-related debris.

Munitions and Explosives of Concern Project, Vallejo, CA, Mare Island Naval Shipyard, MEC/UXO Technician 3. Conducted RI of munitions and explosives of concern (MEC) at Mare Island Production of Munitions Area, Mare Island Naval Shipyard.

Kaho'olawe Island Ordnance Cleanup Project, Hawaii, U.S. Navy, UXO Quality Control Specialist Supervisor. Responsibilities included the supervision of a QC team conducting MIL-STD 1916 surface and subsurface clearance inspections. Also responsible for conducting visual inspections of 5X material, thermally processed material, and light ordnance and demilitarization system (LOADS) processes.

Course Development and Instruction, Kurdistan, Northern Iraq, United Nations Office of Project Services, UXO Instructor/Supervisor. Responsible for course supervision, development of standard operating procedures (SOPs), lesson preparation, and instruction of UXO package for the United Nations Office of Project Services (UNOPS). Also responsible for supervision and guidance of the daily operations of the UXO team.

QC Inspections, Kurdistan, Northern Iraq, UNOPS, Demining Group Supervisor. Responsible for QC inspections of several minefield operations.

Mine Warfare and Demolition Course Training, Gagetown, New Brunswick, Canada, Canadian Forces School of Military Engineering, Instructor. Responsible for the administration, management, and training of various courses associated with demolition and EOD operations. Other responsibilities included planning and preparation of instruction material for EOD training packages, which encompassed conducting and managing both live and practice EOD/demolition range exercises.

EOD/Mine Awareness Operations, Iraq-Kuwait and Croatia, Canadian Military Under United Nations, Section Commander. Responsible for management and supervision of section members while conducting EOD/mine clearance operations while deployed overseas.

GREG B. CLARK

Qualifications Summary

- Over 11 years of experience in the UXO industry.
- 14 years military experience with training in Canada, United Kingdom and the United States
- Experienced Team Supervisor, UXO Safety and Quality Specialist for munitions response projects.
- Unexploded ordnance (UXO) analysis, handling, and disposal.
- Fork Lift and Backhoe Operator
- Automatic External Defibrillator Operator
- Certified Diver
- First Aid/CPR Trained

Registration

USACE Certified UXO Technician (No. 1582)

Fields of Competence

UXO and Modified CWM response projects.
Plans, coordinates, and supervises most aspects of an OE response. Versed in the preparation and execution of plans, procedures and project documentation, while ensuring compliance with DOD Directives, as well as local, state and federal statutes, codes and regulations. Experienced in Site Safety and Quality Control management and supervision of multiple field teams, ensuring compliance with project plans and objectives while accomplishing tasks in a safe manner.

Can perform all tasks for any level UXO Technician, including:

- Reconnaissance and classification of UXO; identification of U.S. and foreign guided missiles; bombs; projectiles; grenades; rockets; land mines; fuzes; pyrotechnic items; military explosives and demolition materials.
- Location of subsurface UXO using geophysical equipment.
- Excavation and recovery of subsurface UXO
- Construction of UXO-related protective works
- Transporting and storing UXO assuring compliance with Federal, state, and local laws;
- Disposal of UXO
- UXO Safety and Quality Control oversight and inspections
- Handling, certification and disposition of scrap material

Credentials

Canadian EOD Basic School – 1982
Canadian Dive School - 1982
Canadian & United Kingdom IEDD - 1994
US Navy EOD Basic School – 1994
40-Hour Hazardous Waste Site Training Course, OSHA 29 CFR 1910.120(e)(3), (2001)

Employment History

2007-PRESENT UXO Safety Officer, Weston Solutions, Fort Ord Marina Ca.
Duties include site preparation for clearance operations in special case areas and construction support for road grading activities. This entails assisting in coordination of community safety plan between community services, public interest groups, and project personnel.

2005-2007 Safety Officer/Quality Control Officer, Schofield Barracks Hawaii, and Sierra Army Depot Nevada, UXO Tech III Fort Hood Texas, and UXO Tech II Fort Belvoir Virginia, all positions with Zapata Engineering. Schofield Barracks is a modified Chemical Clearance Project where he was employed as an Intrusive Team Leader for subsurface clearance operations and was then promoted to a Site Health and Safety Officer. He finished out the project as a combination Quality Control/Safety Officer. Sierra Army Depot was a combination QC/SO position for a land use turnover project. Texas and Virginia projects were both pre-construction clearance sites.

2004-2005 UXO Tech II/ Tech III, USA Environmental, Fort Ord Marina Ca.
Performed as a team member by conducting analog and digital operations for locating, identifying and disposing of numerous types of ordnance and remnants. As Team Leader performed QC operations, conducted safety briefs, and completed all logistical duties of that position.

2001-2004 UXO Specialist Supervisor, UXB International, Kahoolawe Hi.
As an Area Preparation Team Supervisor he was responsible for control of all aspects of an AP team consisting of 8 team members. These duties included brush cutting and clearance operations, ordnance location, identification, disposition, and UXO remnant removal. He was also responsible for all safety, infield training, administration, and coordinating team activities.

1996-2001 Associate Instructor, RAMDAR Consulting, Victoria BC Canada
Instructed clients in the identification of basic military and commercial explosives and related materials. Demonstrated telephone bomb threat scenarios and responses through lecture and practical demonstration.

1996-1996 EOD Specialist, SNC Technologies, Montreal Que. Canada
Located, identified and disposed of numerous types of ordnance and related materials. Performed quality control and certified scrap to be Free from Explosives.

1982-1995 Clearance Diver/EOD Technician, Canadian Armed Forces
Performed as an Instructor at Explosive Ordnance Disposal School for 3 years, instructed up to 20 students on identification, hazards, safety precautions, and disposal of explosive ordnance and improvised devices.

APPENDIX I

Explosives Siting Plan

FORA ESCA REMEDIATION PROGRAM

Appendix I: Explosives Siting Plan

DRAFT FINAL
Group 1 Remedial Investigation / Feasibility Study Work Plan

Volume 2 - Sampling and Analysis Plan

Parker Flats Munitions Response Area Phase II

Former Fort Ord
Monterey County, California

November 13, 2008

Prepared for:

FORT ORD REUSE AUTHORITY

100 12th Street, Building 2880
Marina, California 93933

Prepared Under:

Environmental Services Cooperative Agreement
No. W9128F-07-2-01621
and
FORA Remediation Services Agreement (3/30/07)

Document Control Number: 09595-08-086-005

Prepared by:

LFR

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Westcliffe Engineers, Inc.

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ACRONYMS AND ABBREVIATIONS

Army	U.S. Department of the Army
ASP	Ammunition Supply Point
BRAC	Base Realignment and Closure
DDESB	Department of Defense Explosives Safety Broad
ESCA RP	Environmental Services Cooperative Agreement Remediation Program
ESL	explosive storage location
ESP	Explosives Siting Plan
FORA	Fort Ord Reuse Authority
ft	foot or feet
FUDS	Formerly Used Defense Sites
HFD	hazardous fragment distance
LDSP	Land Disposal Site Plan
LE	Low Explosive
MEC	munitions and explosives of concern
MFD	maximum fragmentation distance
MGFD	munition with the greatest fragmentation distance
mm	millimeter
MRA	Munitions Response Area
MSD	minimum separation distance
POM FD	Presidio of Monterey Fire Department
RI	Remedial Investigation
SUXOS	Senior Unexploded Ordnance Supervisor
TSD	team separation distance
USACE	United States Army Corps of Engineers
UXO	unexploded ordnance
UXOSO	Unexploded Ordnance Safety Officer

1.0 INTRODUCTION

The former Fort Ord, Monterey County, California is the focus of this Explosives Siting Plan (ESP) in support of a Remedial Investigation (RI) to be conducted at the Parker Flats Munitions Response Area (MRA). This is Phase II of the Parker Flats RI and covers approximately 482 acres that potentially contain munitions and explosives of concern (MEC). Detailed information about the Parker Flats MRA can be found in the Group 1 Remedial Investigation and Feasibility Study Work Plan (ESCA RP Team 2008b). This plan for siting explosives operations conforms to the requirements of Data Item Description MR-005-004.

Figure 1 shows the location of the former Fort Ord and the general site layout. Figure 2 shows the Phase II RI area of the Parker Flats MRA. Figure 3 includes all anticipated minimum separation distances (MSDs) for the Parker Flats MRA Phase II.

1.1 Explosive Storage Magazines

Explosive donor charges will be drawn from the established explosive storage location (ESL). The ESL is the former Fort Ord Ammunition Supply Point (ASP) shown on Figure 1. The Department of Defense Explosives Safety Board (DDESB) approved the siting and final safety submission for this ASP on March 8, 1990. The ASP’s magazines are standard earth-covered facilities. After Fort Ord closed under Base Realignment and Closure (BRAC), DDESB approved a change to the use of the magazines and resited them to allow the U.S. Department of the Army (“Army”) to use the magazines for the storage of demolition materials for unexploded ordnance (UXO) contractors executing Fort Ord’s munitions response actions. The Army used the magazines in this way for a number of years. The Army is no longer using the magazines and will eventually deed transfer the entire ESL to the Fort Ord Reuse Authority (FORA). Until transfer, the ESL will temporarily remain Army property, but the Army has granted a right of entry to FORA to allow FORA's contactors to use it to store demolition explosives. The ESL will continue to be used for UXO contractor munitions response actions for approximately 7 years. Siting of these magazines is covered under the DDESB final approval of the “2nd Addendum to the 3rd Amendment to the 17 Feb 94 Land Disposal Site Plan (LDSP) for BRAC of Fort Ord, California,” dated January 14, 2008 (ESCA RP Team 2008a). The MSD requirements for each of the three earth-covered facilities being used at the ESL (Buildings 763, 764, and 765) are shown on Figures 4, 5, and 6.

1.2 Engineering Controls

Engineering controls will be implemented during intentional detonations per the guidance set forth in HNC-ED-CS-S-98-7, Use of Sandbags for Mitigation of Fragmentation and Blast Effects Due to Intentional Detonation of Munitions. Only one item will be disposed of at a time when engineering controls are being employed.

In areas where an acceptable fragmentation distance cannot be achieved, items that are safe to move may be moved to another area as long as the movement does not require transportation on public roads. If movement to another area is not possible, engineering controls (in accordance with HNC-ED-CS-S-98-7) will be employed to reduce the fragmentation hazard.

1.3 Munitions and Explosives of Concern

All recovered MEC will be blown-in-place in the grid found; engineering controls will be utilized to mitigate the hazard posed by fragments produced by the detonation.

1.4 Minimum Separation Distance

Figure 3 includes all anticipated MSDs for the Parker Flats MRA Phase II. The selection of the munition with the greatest fragmentation distance (MGFD) for the Parker Flats Phase II area is based on the results of MEC investigations and removal action in the Parker Flats MRA Phase I and Phase II areas.

- The MGFD for the northern portion of the Parker Flats Phase II area is the 37 millimeter (mm), MK I, Low Explosive (LE) projectile. This is a conservative assumption because 37 mm LE projectiles were only found in the Parker Flats Phase I areas, and none have been found in the Phase II areas.
- The MGFD for the southern portion of the Parker Flats Phase II area is the 75 mm MK I (shrapnel) projectile.

1.4.1 Maximum Fragmentation Distance MSD for Intentional Detonations

The maximum fragmentation distance (MFD) is in accordance with the Fragmentation Data Sheet for the 37 mm, MK I, LE projectile, and will be used for intentional detonations, as shown on Figure 3. The MFD for the 37 mm, MK I, LE projectile is 816 feet (ft) and the MFD for the 75 mm MK I (shrapnel) is 743 ft. Engineering controls for intentional detonations, per the guidance set forth in HNC-ED-CS-S-98-7, Use of Sandbags for Mitigation of Fragmentation and Blast Effects Due to Intentional Detonation of Munitions, will be employed to reduce the MFD.

The withdrawal distance or MSD for intentional detonations using sandbags is 200 ft, as shown on Figure 3. Engineering controls will be utilized for single item detonations only. Any inhabited buildings that fall within the MSD will be evacuated during MEC operations. All roadways will be blocked, with road guards (or equivalent) to ensure that nonessential personnel do not enter the MSD during MEC activities.

1.4.2 Hazardous Fragment Distance MSD for Nonessential Personnel for Unintentional Detonations

The MSD for nonessential personnel is as shown on Figure 3. The hazardous fragment distance (HFD) will be used for unintentional detonations based on the Fragmentation Data Sheet. The MSDs for intentional and unintentional detonations are provided in Table 1.

Table 1: Minimum Separation Distances

MEC Operation	MSDs (ft)			
	37 mm MK I, LE		75 mm MK I (Shrapnel)	
	Essential Personnel	Nonessential Personnel	Essential Personnel	Nonessential Personnel
Unintentional Detonations	NA	68	NA	200
Intentional Detonations with Engineering Controls	200	200	200	200
Intentional Detonations without Engineering Controls	816	816	743	743

NA = Not Applicable (see team separation distance section below)

1.4.2.1 Authorization to Use Unintentional Detonation MSD HFD

United States Army Corps of Engineers (USACE) has intrusively investigated millions of surface MEC items and subsurface anomalies that have the potential to be UXO over the past 15 years on more than 1,000 project locations for Formerly Used Defense Sites (FUDS), BRAC, and active installations. These are extremely conservative estimates. On one project alone, USACE investigated over 3,000,000 anomalies, of which approximately 1.67% were UXO, with no accidents or unintentional detonations. For these reasons, the probability of an unintentional detonation, due to project activities, is assessed to be “Extremely Low,” and the use of the HFD, for unintentional detonations, is warranted and authorized.

1.4.3 Team Separation Distance

Team separation distance (TSD) will be in accordance with the Fragmentation Data Sheet’s K40 distance as shown on Figures 7 and 8. TSDs are 18 ft for the 37 mm MK I, LE and 10 ft for the 75 mm MK I (shrapnel).

1.4.4 Increase of MSD

If, during the course of operations, a munition with a greater fragmentation distance is encountered, the MSD will immediately be adjusted in accordance with DDESB Technical Paper 16, and operations will continue. In response, an amendment to this ESP will be expeditiously submitted.

1.5 Demolition Areas

No dedicated demolition area will be established at the Parker Flats MRA Phase II RI area. MEC identified within the Parker Flats MRA Phase II RI area will be blown-in-place using engineering controls to mitigate the hazard posed by fragments produced by the detonation.

1.6 Footprint Areas

There are no identified disposal areas.

1.6.1 Detonation Site and Blow-in-Place

Recovered MEC will be blown-in-place within the investigation area or transect found within the Parker Flats MRA. Material Potentially Presenting an Explosive Hazard and items requiring demilitarization may be stored in the MEC explosive magazine and added to future planned demolition shots. Items that are unsafe to move will be disposed of in the location where they are encountered.

Prior to initiation of demolition operations, all nonessential personnel will be evacuated from the exclusion zone. Before the demolition charges are primed, all avenues of ingress will be physically blocked by guard personnel. Radio communications will be maintained between all involved parties at all times. Avenues of ingress are not to be opened without the permission of the Senior Unexploded Ordnance Supervisor (SUXOS). A constant state of vigilance will be maintained by all personnel to detect any intrusion into the fragmentation zone including over flights by aircraft. Upon completion of disposal operations, the disposal team's UXO Technician III (Demolition Supervisor) and the Unexploded Ordnance Safety Officer (UXOSO) will visually inspect each disposal shot. The Technician III will perform a visual inspection of the disposal site(s). The UXOSO will stand by at a safe distance and be prepared to render assistance in the event of an emergency. Upon completion of this inspection and providing that there are no residual hazards, the SUXOS will authorize the resumption of operations.

Prior to any detonation, the SUXOS will initiate the appropriate notification and approval procedure. The SUXOS will schedule the demolition to allow sufficient time to complete all notifications and approvals.

Notifications and approvals will be conducted as follows:

- Complete the MEC Disposal Checklists and notifications for each disposal operation
- Request Presidio of Monterey Fire Department (POM FD) to perform an on-site fire risk assessment. For planned detonations, risk assessments require a 3-day notification and demolition shots require a 5-day notification. POM FD will expedite risk assessments for demolition shots that cannot be delayed. Following property transfer, requirements for risk assessments will be determined by the City of Seaside Fire Department, if the detonation is being conducted within the jurisdiction of the City of Seaside, or by the

Salinas Rural Fire District, if the detonation is being conducted within the jurisdiction of Monterey County.

- Complete a Detonation Approval Checklist/Risk Assessment and submit to the FORA ESCA Remediation Program Manager for approval.

1.6.2 Collection Points

Collection points are not applicable to this project.

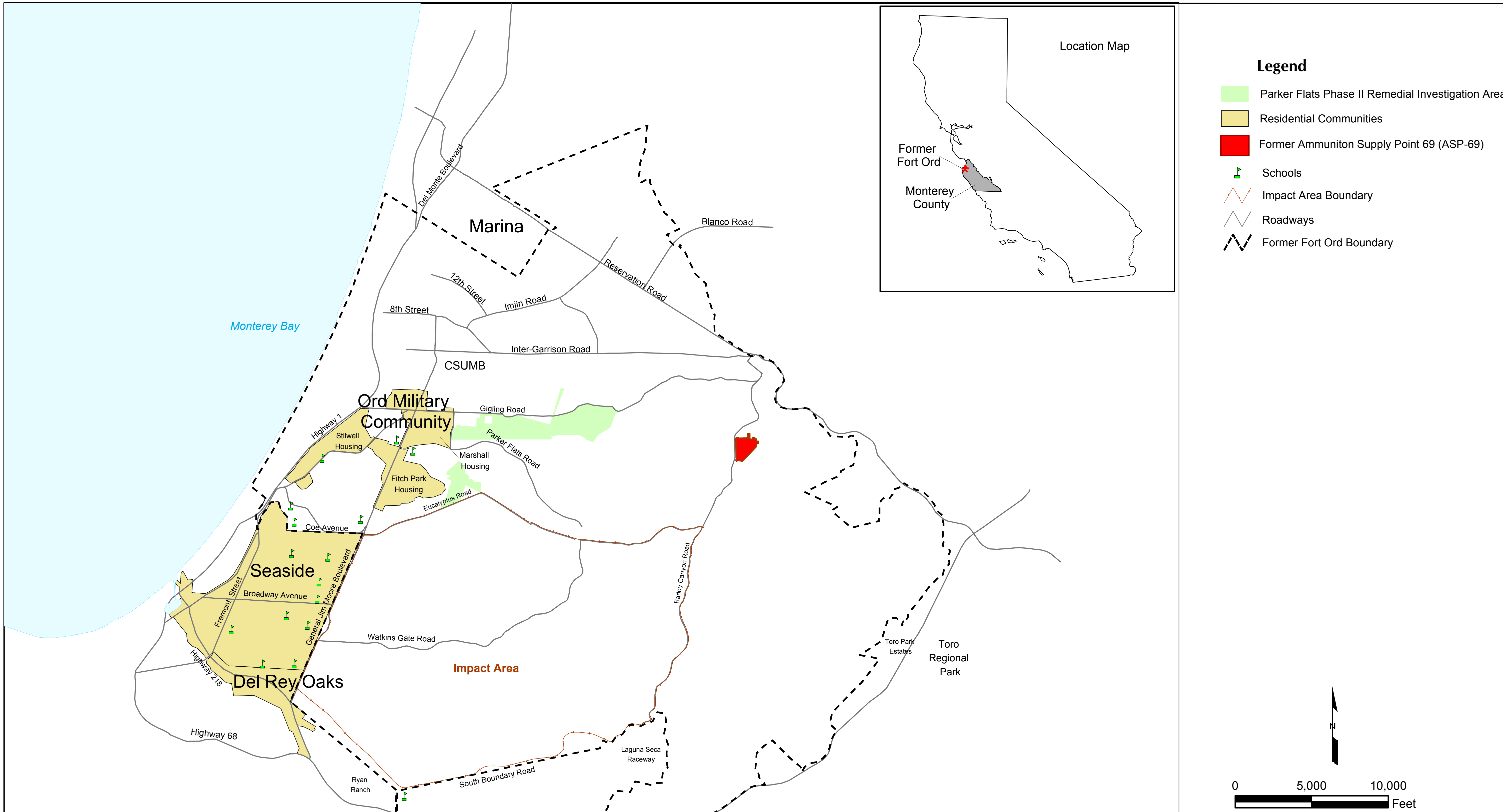
1.6.3 In-Grid Consolidated Shots

In-grid consolidated shots are not applicable to this project.

2.0 REFERENCES

Environmental Services Cooperative Agreement Remediation Program Team (ESCA RP Team). 2008a. 2nd Addendum to the 3rd Amendment to the 17 Feb 94 Land Disposal Site Plan (LDSP) for BRAC of Fort Ord, California, Phase II Seaside Munitions Response Area (MRA) Removal Action, Former Fort Ord, Monterey County, California. January 14.

———. 2008b. Draft Group 1 Remedial Investigation/Feasibility Study Work Plan, Volumes 1 and 2, Seaside and Parker Flats MRAs, Former Fort Ord, Monterey County, California. May 23.



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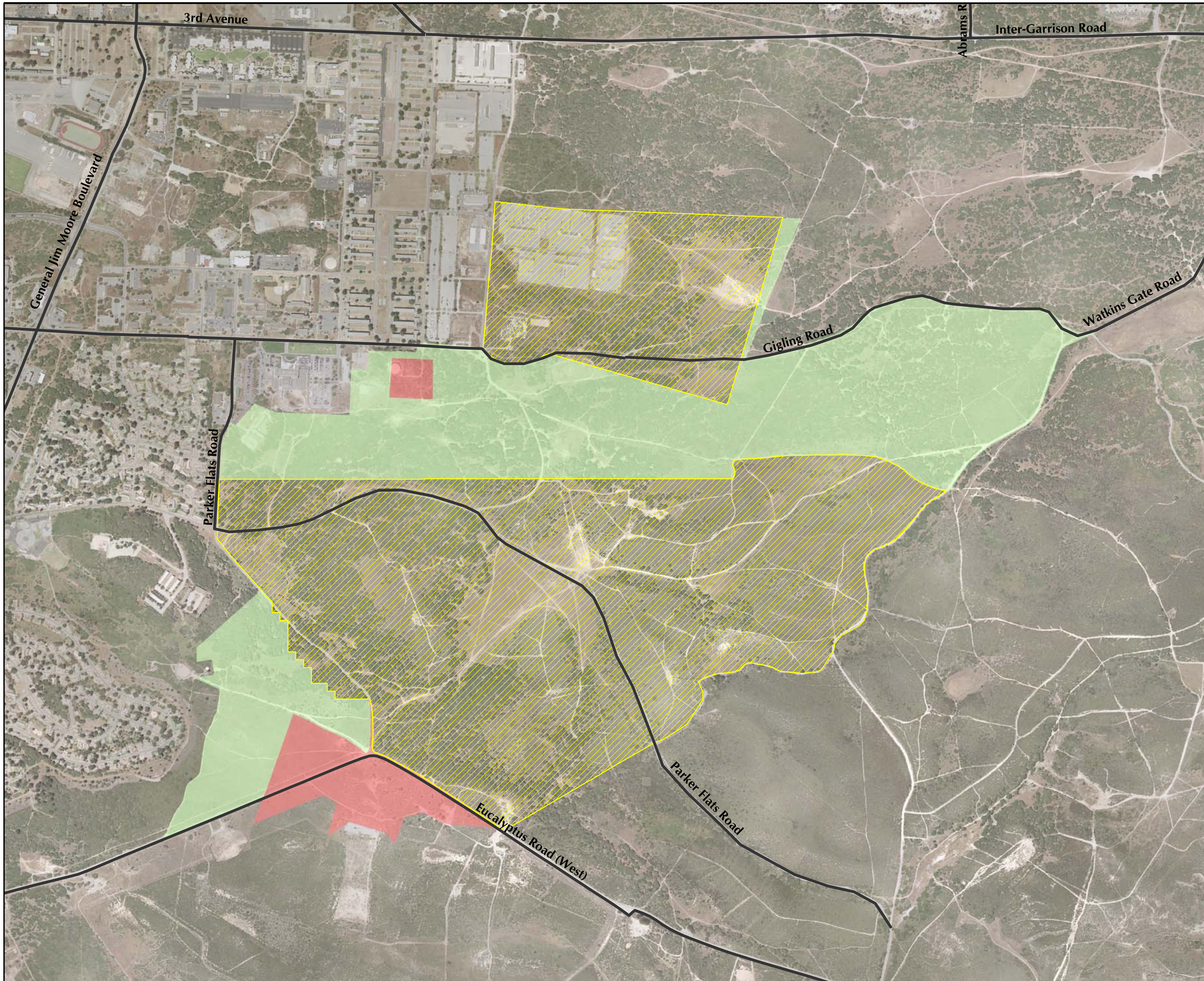
Location Map

FORA ESCA RP
Monterey County, California

Figure 1



Legend

- Phase II Remedial Investigation Area
- Major Road
- Phase I Remedial Investigation Area
- Phase II Removal Action Completed

N

0 1,250 2,500 Feet

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Parker Flats MRA
Phase II Remedial Investigation Area

FORA ESCA RP
Monterey County, California

Figure 2

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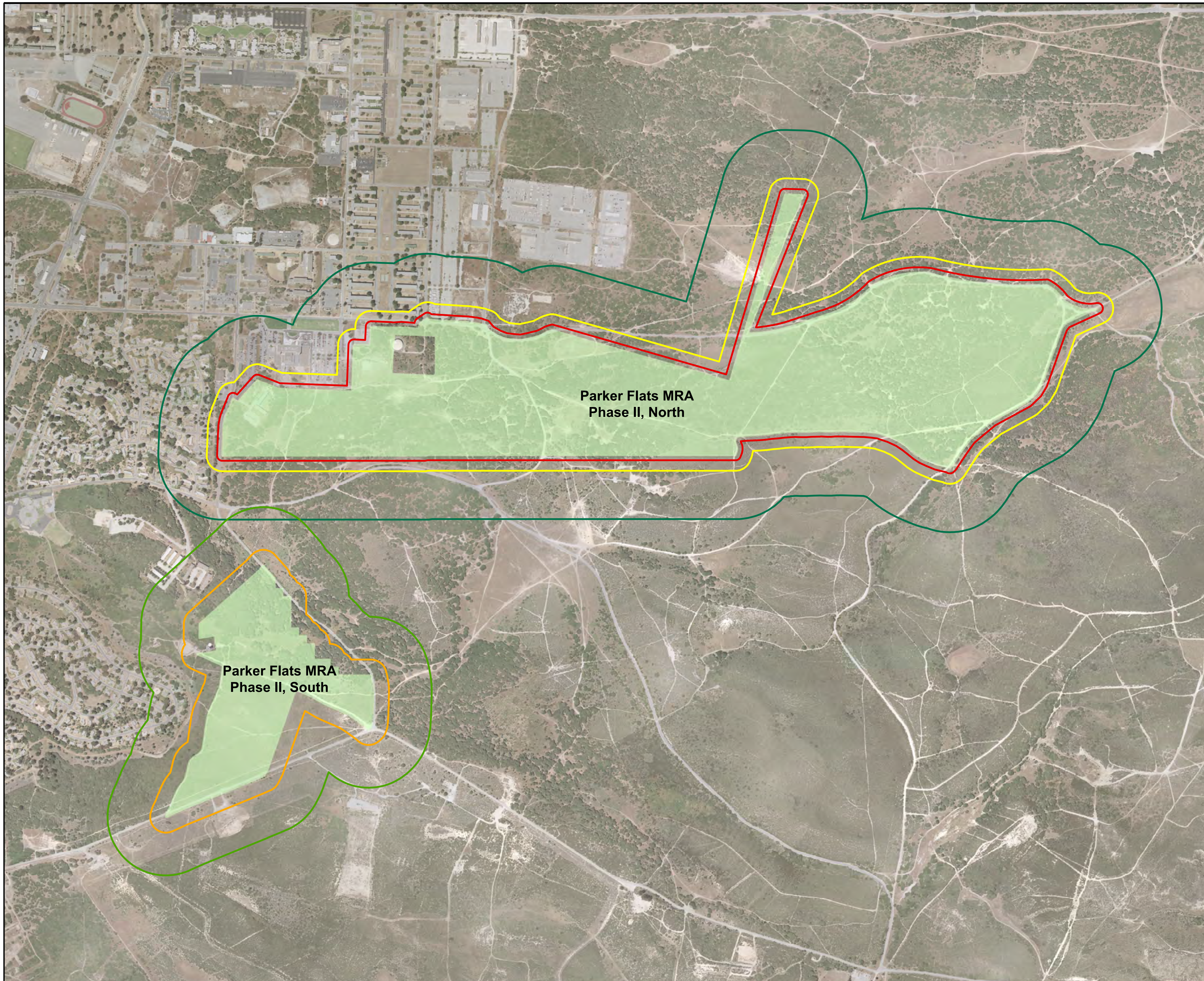

Legend

Parker Flats MRA
Phase II Remedial Investigation Area

Parker Flats MRA - Phase II, North

Hazardous Fragmentation Distance of 68 Feet for Projectile, 37mm, LE MK I

Minimum Separation Distance of 200 Feet for Sandbagged Detonations

Maximum Fragmentation Distance of 816 Feet for Projectile, 37mm, LE MK I

Parker Flats MRA - Phase II, South

Hazardous Fragmentation Distance of 200 Feet for Projectile, 75mm, MK I (shapnel)
AND
Minimum Separation Distance of 200 Feet for Sandbagged Detonations

Maximum Fragmentation Distance of 743 Feet for Projectile, 75mm, MK I (shrapnel)

N

0 1,250 2,500
Feet

LFR
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Parker Flats MRA
Phase II Remedial Investigation
Minimum Separation Distances

FORA ESCA RP
Monterey County, California

Figure 3

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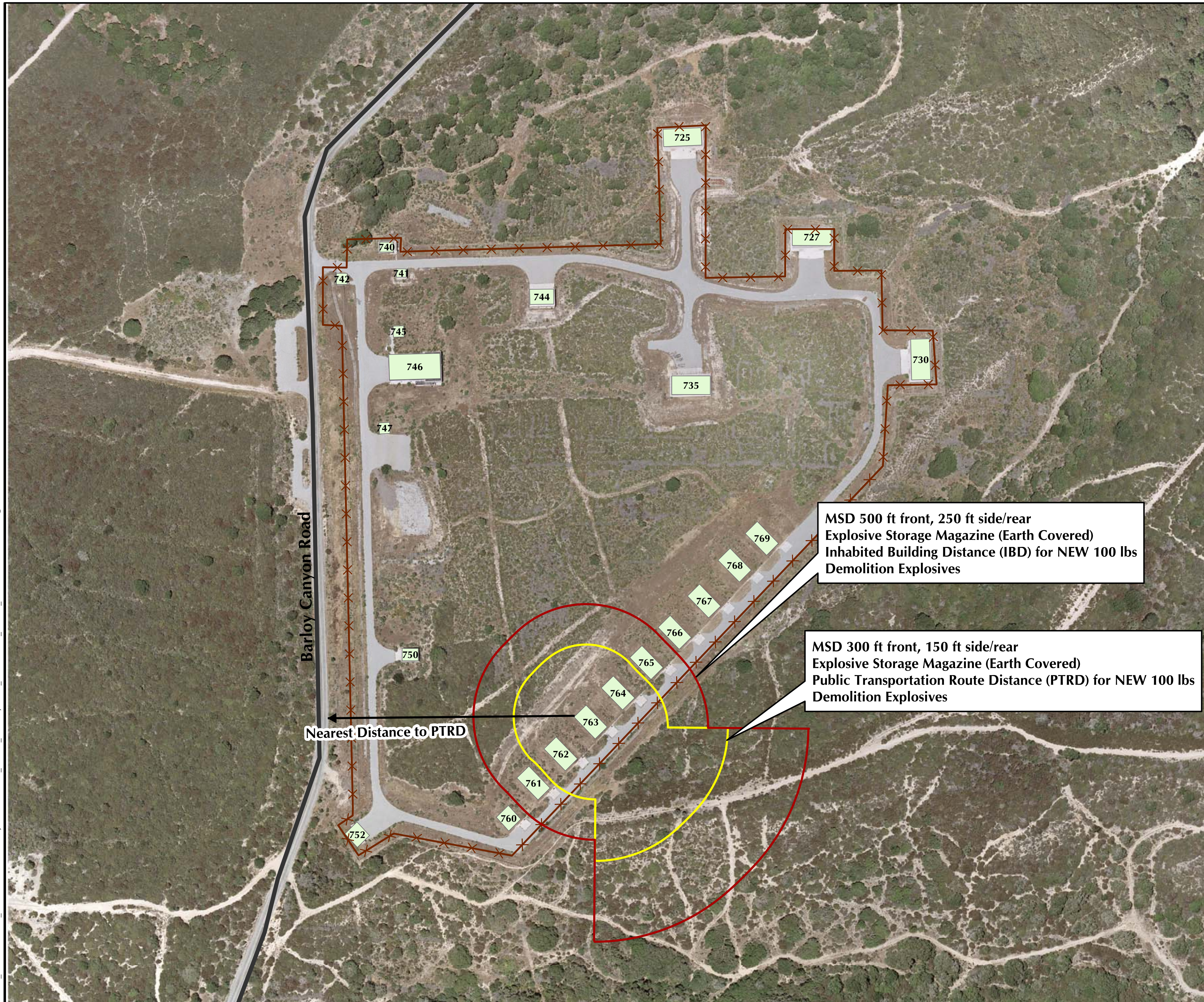

Legend

Building

Major Road

Fencing

Minimum Separation Distance (MSD)

Public Traffic Route

Inhabited Buildings

N

0 250 500 Feet

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Explosive Storage Location (Building 763) Minimum Separation Distances

FORA ESCA RP
Monterey County, California

Figure 4

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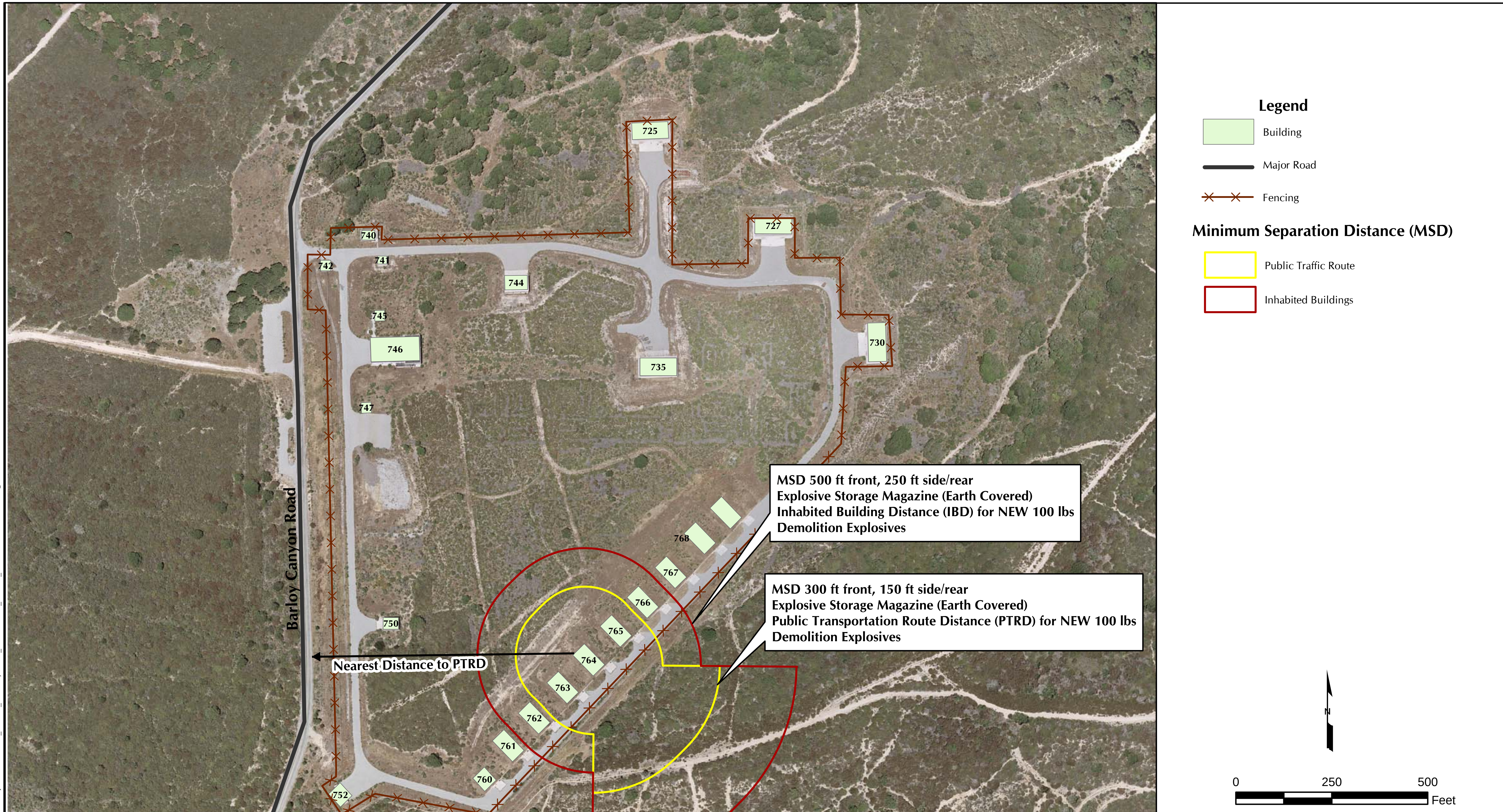

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Explosive Storage Location (Building 764) Minimum Separation Distances

FORA ESCA RP
Monterey County, California

Figure 5

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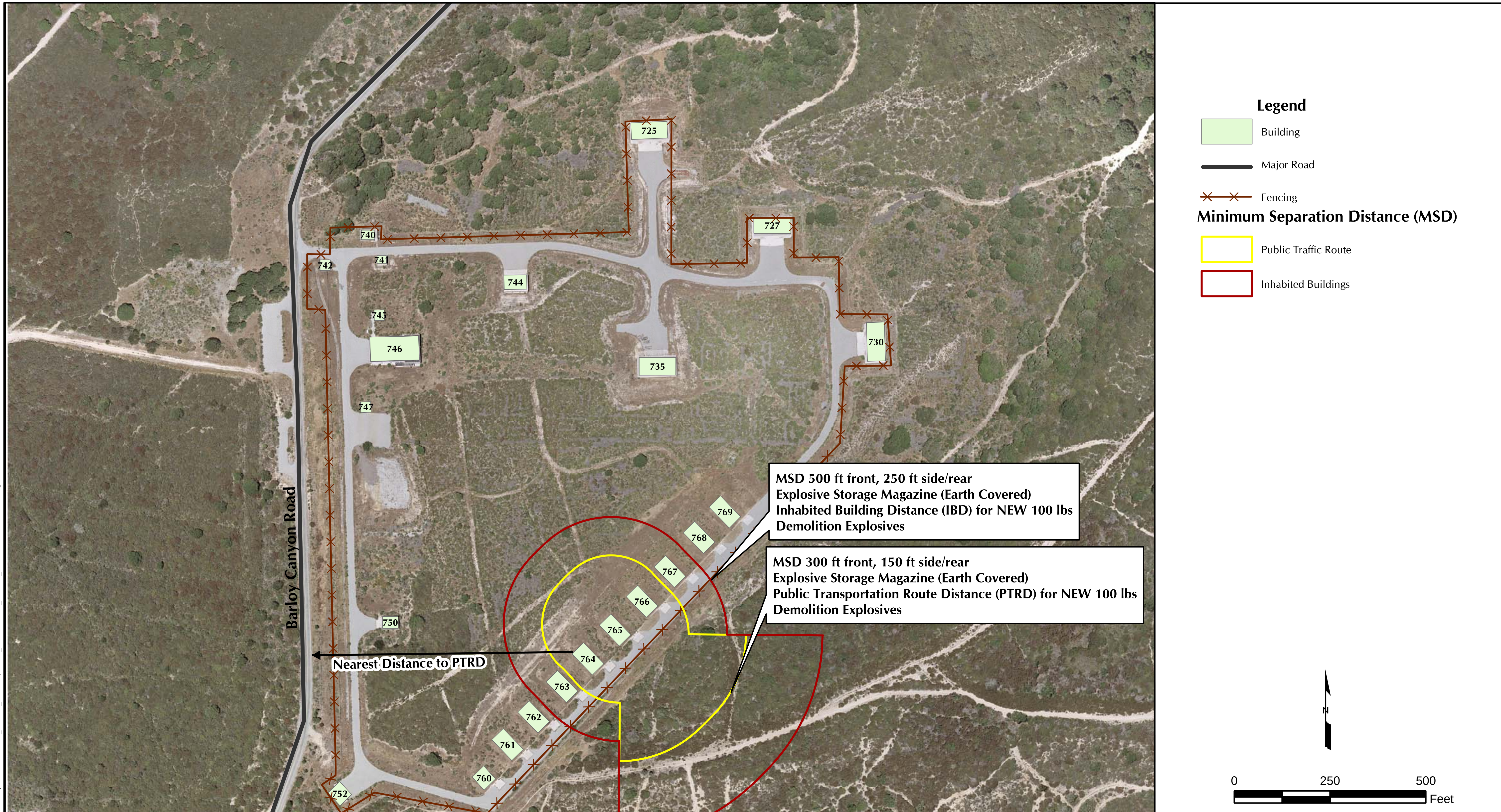

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Explosive Storage Location (Building 765) Minimum Separation Distances

FORA ESCA RP
Monterey County, California

Figure 6

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FRAGMENTATION DATA REVIEW FORM

Database Revision Date 12/31/07

Category:	Black Powder Roun	DODIC:	
Munition:	37 mm Mk I, LE Practice	Date Record Created:	7/30/2004
		Last Date Record Updated:	7/9/2007
Primary Database Category:	projectile	Individual Last Updated Record:	Crull
Secondary Database Category:	37 mm	Date Record Retired:	
Munition Case Classification:	N/A		

Munition Information and Fragmentation Characteristics

Explosive Type:	Black Powder
Explosive Weight (lb):	0.03400
Diameter (in):	1.4567
Max Fragment Weight (lb):	0.034207
Critical Fragment Velocity (fps):	1368

Theoretical Calculated Fragment Range

HFD [Range to No More Than 1 Hazardous Fragment per 600 Square Feet] (ft):	68
MFR-V [Vertical Range of Max Weight Fragment] (ft):	570
MFR-H [Horizontal Range of Maximum Weight Fragment] (ft):	816

Overpressure Distances

Inhabited Building Distance (12 psi), K40 Distance:	10
Inhabited Building Distance (09 psi), K50 Distance:	13
Intentional MSD (0065 psi), K328 Distance:	83

Minimum Thickness to Prevent Perforation

4000 psi Concrete (Prevent Spall):	1.69
Mild Steel:	0.20
Hard Steel:	0.16
Aluminum:	0.41
LEXAN:	2.49
Plexi-glass:	1.37
Bullet Resist Glass:	1.07

Required Sandbag Thickness

Max Fragment Weight (lb)SB:	0.034207
Critical Fragment Velocity (fps)SB:	1368
Kinetic Energy 106 (lb-ft2/s2)SB:	0.0320
Required Wall Roof Sandbag Thickness (in)SB:	12
Expected Maximum Sandbag Throw Distance (ft)SB:	25
Minimum Separation Distance (ft)SB:	200

Water Containment System and Minimum Separation Distance:

Max Fragment Weight (lb)W:	0.034207
Critical Fragment Velocity (fps)W:	1368
Kinetic Energy 106 (lb-ft2/s2)W:	0.0320
Water Containment System:	5 gal carboys/ inflatable pool
Minimum Separation Distance (ft)W:	200/200

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MSDs and Fragmentation Characteristics for Projectile, 37 mm, Low Explosive MK I

FORA ESCA RP
Monterey County, California

Figure 7

FRAGMENTATION DATA REVIEW FORM

Database Revision Date 12/31/07

Category:	Black Powder Roun	DODIC:	
Munition:	75 mm Mk1 (Shrapnel)	Date Record Created:	7/30/2004
		Last Date Record Updated:	7/18/2005
Primary Database Category:	projectile	Individual Last Updated Record:	Crull
Secondary Database Category:	75 mm	Date Record Retired:	
Munition Case Classification:	N/A		

Munition Information and Fragmentation Characteristics

Explosive Type:	Black Powder
Explosive Weight (lb):	0.19000
Diameter (in):	2.9528
Max Fragment Weight (lb):	0.026600
Critical Fragment Velocity (fps):	1200

Theoretical Calculated Fragment Range

HFD [Range to No More Than 1 Hazardous Fragment per 600 Square Feet] (ft):	200
MFR-V [Vertical Range of Max Weight Fragment] (ft):	523
MFR-H [Horizontal Range of Maximum Weight Fragment] (ft):	743

Overpressure Distances

Inhabited Building Distance (12 psi), K40 Distance:	18
Inhabited Building Distance (09 psi), K50 Distance:	23
Intentional MSD (0065 psi), K328 Distance:	148

Minimum Thickness to Prevent Perforation

4000 psi Concrete (Prevent Spall):	2.14
Mild Steel:	0.14
Hard Steel:	0.11
Aluminum:	0.28
LEXAN:	1.76
Plexi-glass:	0.96
Bullet Resist Glass:	0.76

Required Sandbag Thickness

Max Fragment Weight (lb)SB:	0.026600
Critical Fragment Velocity (fps)SB:	1200
Kinetic Energy 106 (lb-ft2/s2)SB:	0.0192
Required Wall Roof Sandbag Thickness (in)SB:	12
Expected Maximum Sandbag Throw Distance (ft)SB:	25
Minimum Separation Distance (ft)SB:	200

Water Containment System and Minimum Separation Distance:

Max Fragment Weight (lb)W:	0.026600
Critical Fragment Velocity (fps)W:	1200
Kinetic Energy 106 (lb-ft2/s2)W:	0.0192
Water Containment System:	5 gal carboys/ inflatable pool
Minimum Separation Distance (ft)W:	200/200

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MSDs and Fragmentation Characteristics for Projectile, 75 mm, MK I (Shrapnel)

FORA ESCA RP
Monterey County, California

Figure 8

APPENDIX J

Site Safety and Health Plan

Appendix J: Site Safety and Health Plan

DRAFT FINAL
Group 1 Remedial Investigation / Feasibility Study Work Plan

Volume 2 - Sampling and Analysis Plan

Parker Flats Munitions Response Area Phase II

Former Fort Ord
Monterey County, California

November 13, 2008

Prepared for:

FORT ORD REUSE AUTHORITY

100 12th Street, Building 2880
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Document Control Number: 09595-08-086-005

Prepared by:

LFR

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ACRONYMS AND ABBREVIATIONS

ACGIH	American Conference of Governmental Industrial Hygienists
CFR	Code of Federal Regulations
CHOMP	Community Hospital of the Monterey Peninsula
CPR	cardiopulmonary resuscitation
DGM	Digital Geophysical Mapping
DMM	discarded military munitions
EOD	Explosive Ordnance Disposal
EPA	U.S. Environmental Protection Agency
ESCA RP	Environmental Services Cooperative Agreement Remediation Program
EZ	exclusion zone
FLD	field operating procedure
FORA	Fort Ord Reuse Authority
G1 SAP	Group 1 Sampling and Analysis Plan
GPS	Global Positioning System
HAZWOPER	Hazardous Waste Operations and Emergency Response
LFR	LFR Inc.
MEC	munitions and explosives of concern
MSD	minimum separation distance
MSDS	material safety data sheet
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
OSIC	On Scene Incident Commander
PHSM	Project Health and Safety Manager
POM	Presidio of Monterey
PPE	personal protective equipment
RMSF	Rocky Mountain Spotted Fever
RPM	Remediation Project Manager
SOP	standard operating procedure
SSHP	Site Safety and Health Plan

SUXOS	Senior Unexploded Ordnance Supervisor
TEU	Technical Escort Unit
TLV	threshold limit value
UXO	unexploded ordnance
UXOSO	UXO Safety Officer
WESTON	Weston Solutions, Inc.
WP	white phosphorous

J-1.0 INTRODUCTION

The purpose of this Site Safety and Health Plan (SSHP) is to establish general guidelines and procedures to ensure protection of the Environmental Services Cooperative Agreement Remediation Program (ESCA RP) Team and subcontractor personnel and the public while performing operations at the former Fort Ord. The plan assigns responsibilities, establishes procedures, and develops contingencies that may arise while operations are performed.

The provisions of this plan are mandatory for all on-site activities undertaken by the ESCA RP Team and its subcontractors. All site activities will comply with applicable federal and California requirements. As site conditions change, this plan may need to be modified. Such modifications will be submitted as SSHP addenda and will be numbered sequentially. All SSHP addenda must be reviewed and approved by the Project Health and Safety Officer. All ESCA RP Team personnel and subcontractors must read and understand this SSHP and sign the Plan Acceptance Form prior to the start of work at the site.

J-1.1 Site Compliance Checklist

The Site Compliance Checklist presented in Appendix A of this SSHP will be used by the Unexploded Ordnance Safety Officer (UXOSO) to conduct the project's monthly safety audit. A copy of the checklist will be given to the Remediation Project Manager (RPM), the program-certified industrial hygienist, and the UXOSO. Noncompliance issues will be corrected promptly and reported to the individuals receiving the compliance checklist.

J-2.0 PROJECT TEAM RESPONSIBILITIES

Ensuring the safe and healthful conduct of site operations is the responsibility of everyone assigned to the site. The ESCA RP Team and subcontract personnel involved in site activities are responsible for the following:

- Complying with this SSHP and all other required safety and health guidelines
- Taking all necessary precautions to prevent injury to themselves and to their fellow employees
- Continually being alert to any potentially harmful situation and immediately informing the UXOSO of any such identified conditions
- Performing only those tasks that they believe they can do safely and have been trained to perform
- Preventing spillage and splashing of materials to the greatest extent possible
- Practicing good housekeeping by keeping the work area neat, clean, and orderly
- Immediately reporting all injuries, no matter how minor, to the UXOSO
- Maintaining site equipment in good working order and reporting defective equipment to the UXOSO

- Properly inspecting and using the personal protective equipment correctly

J-2.1 Employee Safety Responsibilities

All operations and personnel having the potential for exposure to site hazards are subject to the requirements of this SSHP. Work will not be performed in a manner that conflicts with the safety, health, or environmental precautions outlined in this plan. All site personnel, including any ESCA RP Team subcontractors, who have the potential for exposure to site hazards, are subject to the requirements of this SSHP. Personnel violating safety procedures are subject to dismissal/removal from the project site. Roles and responsibilities for site personnel are summarized in the following subsections.

The following sections describe the roles and responsibilities of the key Weston Solutions, Inc. (WESTON) team members that will be responsible for field activities. These key team members are also shown on the ESCA RP Team Organization Chart presented in the Group 1 Sampling and Analysis Plan (G1 SAP; Figure 2-8).

J-2.2 Remediation Project Manager

Ms. Linda Temple will serve as the Remediation Project Manager for the activities covered under this work plan. She has overall responsibility for the management and completion of the project, which includes resource allocation, financial reporting, schedule control, and review and approval of deliverables.

J-2.3 Project Health and Safety Manager

The Project Health and Safety Manager (PHSM) for this project is Mr. Mike Stuart. The PHSM has the following responsibilities.

- Review and final approval of the SSHP.
- Ensure that the SSHP complies with all federal, state, and local health and safety requirements.
- If necessary, modify specific aspects of the SSHP to adjust for on-site changes that will affect safety.
- Evaluate and authorize and changes to the SSHP.
- Implementation and oversight of the Health and Safety Program.
- Assist in acting as liaison with government officials regarding health and safety-related issues.
- Maintain frequent communication with the Site Safety and Health Officer (UXOSO) regarding site activities and implementation of the SSHP. Assist in training site personnel in the site-specific hazards.

- Ensure that both the site and site personnel comply with the Safety Program and all other applicable plans.

J-2.4 Senior UXO Supervisor

Mr. Bruce Moe will serve as the Senior Unexploded Ordnance Supervisor (SUXOS) and will manage field operations in accordance with project requirements. The SUXOS is responsible for coordinating and supervising all site activities.

J-2.5 Unexploded Ordnance Safety Officer

The UXOSO will be responsible for implementing the SSHP and ensuring that all project personnel follow the requirements of the SSHP. In addition to overall site safety, he will also be responsible for enforcing UXO safety as it applies to munitions and explosives of concern (MEC) operations.

The UXOSO will be responsible for conducting the morning safety meeting for all site personnel to discuss the day's activities, associated hazards, and MEC safety. He will also be required to report any incidents that occur on site to the PHSM. He will be required to implement safety corrective actions through training and reinforced awareness.

J-2.6 Subcontractors

Qualified subcontractors and associate personnel may be brought on site for specialty services that may include, but are not limited to: surveying, heavy equipment delivery and removal, vegetation removal, and demolition. These subcontractors will be under the ultimate direction of the SUXOS and are required to adhere to all aspects of the SSHP.

J-3.0 UNKNOWN FILLER

In the event munitions suspected of containing unknown filler is encountered, field activities should be conducted in accordance with the Standard Operating Procedure (SOP) for MEC with Unknown Filler presented in Appendix D.

J-4.0 FIELD ACTIVITIES

The fieldwork will generally consist of mobilization, site preparation, excavation operations, MEC operations, and demobilization. These major activities can be summarized as follows:

Activity 1: Preliminary Activities

This task includes the mobilization of personnel, equipment, and supplies to the project site and setup of office and storage areas.

Activity 2A: Site Preparation Activities

This task includes site surveying to delineate work areas, brush cutting, general surface debris removal, and building demolition.

Activity 2B: Biological Monitoring and Field Surveys

Vegetation monitoring activities occur primarily in advance of UXO/MEC remediation activities and include ingress and egress to monitoring sites, marking of monitoring sites, and recording data. This will require walking, bending, and kneeling, occasional hammering of stakes, and operating Global Positioning System (GPS) units. The field biologists will use GPS units to map monitoring locations.

The UXOSO and the SUXOS will be coordinated with in advance of the biological monitoring activity to fully understand the field activities including: geographic location; type of field activities (i.e., intrusive or non-intrusive); and composition of team (i.e., subcontractors, on-staff biologist, etc.) The UXOSO and/or SUXOS will evaluate the proposed biological monitoring activities and make a determination as to the need for UXO escorts.

Activity 3: Excavation/Earth Moving Activities

This task includes grubbing and scraping approximately 6 inches of soil from the Residential Quality Assurance pilot study test areas (Appendix F of the G1 SAP).

Activity 4: Geophysical Investigation Activities

This task includes the geophysical investigation of the Parker Flats Munitions Response Area Phase II areas as described in Section 2 of the G1 SAP. This includes Digital Geophysical Mapping (DGM) and analog investigations. The first step will be the implementation of the Geophysical Test Plot. The DGM will be accomplished by using a towed array configuration. An all-terrain vehicle will be used to tow the DGM equipment across the survey area. Man-portable analog systems will also be utilized.

Activity 5: MEC Operations

This task includes MEC safety escort activities, excavation and removal of potential MEC anomalies, and destruction/disposal of MEC and scrap materials.

UXO technicians II will inspect work areas prior to performing survey or clearing operations for hazardous MEC items as well as escort any visitors during work activities.

The UXOSO coordinates access control and security on site during all MEC operations. Except for low risk MEC escort activities, only essential personnel will be allowed in the work zone. The work zone is the work site, and encompasses an area large enough to prevent personnel injuries from fragmentation resulting from unintentional or intentional detonations.

During on-site operations, the SUXOS will order operations to cease if nonessential personnel are observed within the operating area. To ensure safety, site controls include the following:

- Eating, drinking, and smoking are prohibited except in designated areas.
- Hazardous MEC operations cease if nonessential personnel are present.
- The SUXOS, UXOSO, or their designee escorts authorized site visitors.
- All personnel entering the site, including visitors, will wear the proper personal protective equipment (PPE) and sign in and out on the site visitor's log.
- The UXOSO maintains the Site Control Log to ensure accurate accountability of personnel on site.

The UXOSO provides a SSHP/MEC safety briefing to all personnel entering the site to inform them of potential site hazards. All personnel must acknowledge this briefing by signing the SSHP Review Form.

In case of an emergency, personnel exit the site and move to a designated safe area. The UXOSO will determine the designated safe area that is located upwind of the site outside of the fragmentation area. The SUXOS will notify the site manager if an emergency warrants site evacuation.

Activity 6: Closeout Activities

This task includes the restoration of work areas and the demobilization of all remaining equipment, temporary structures, and other items from the project site after project completion.

J-5.0 HAZARD ANALYSIS AND RISK ASSESSMENT

Safety, biological, and physical hazards will present a risk to workers at former Fort Ord sites. The level of risk is dependent upon the type of work being done. The paragraphs that follow describe the safety, biological, and physical hazards associated with planned activities.

J-5.1 Safety Hazards

The major safety hazard for operations performed at former Fort Ord sites is the unintended detonation of ordnance. Other anticipated safety hazards include heavy equipment operation, excavation safety, slip hazards, and power tool use. Procedures to minimize these hazards are presented below.

J-5.1.1 MEC

Ordnance and ordnance-related items will be encountered at the former Fort Ord site. Personnel must be alert for MEC and munitions debris. All field personnel must observe the following general safety precautions:

- DO NOT touch or move any MEC until positive identification has been determined, regardless of the markings or apparent condition.
- DO NOT visit an ordnance site if an electrical storm is occurring or approaching. If a storm approaches during a site visit, leave the site immediately and seek appropriate shelter.
- DO NOT use radios or cellular phones in the vicinity of suspect MEC.
- DO NOT walk across an area where the ground cannot be seen. If dead vegetation or animals are observed, leave the area immediately due to potential contamination by chemical agent.
- DO NOT drive vehicles into areas suspected of MEC. Use clearly marked lanes.
- DO NOT rely on color code for positive identification of MEC nor their contents.
- SMOKING will only be allowed in smoking areas designated by the SUXOS during the morning Tailgate Safety Briefing.
- Approach ordnance items from the side.
- Prohibit unnecessary personnel from visiting the site.
- Decontaminate the vehicle interior when deemed necessary to prevent the spread of poison oak oils and sap.
- Always assume MEC contain a live charge until it can be ascertained otherwise.
- The following precautions are applicable to personnel performing MEC recovery and demolition operations.
- All MEC will be identified independently by two (2) UXO Technicians.
- All MEC operations will use the "Buddy" system.
- Demolition operations will as a minimum conform to TM 60A-1-1-31.
- DO NOT dismantle, strip, or handle any MEC unnecessarily.
- Avoid inhalation and skin contact with smoke, fumes, dust, and vapors of detonations and residue from MEC.
- DO NOT attempt to extinguish burning explosives or any fire, which might involve explosive materials.
- DO NOT manipulate external features of MEC unless specifically called for in an Explosive Ordnance Disposal (EOD) procedure.
- Incorporate appropriate property and personnel protective measures for shock and fragmentation when conducting MEC operations.

- Do not subject MEC to rough handling or transportation. Sand bag, chock and block appropriately.
- Carry explosives in an appropriate container.
- Hand carry no more than two items (one in each hand) at a time and then only as required by the operation being performed.
- Destroy shaped charge munitions by crushing the cone to prevent formation of the explosive jet.
- Dispose of white phosphorous (WP) munitions in accordance with the direction of the UXO Safety Specialist.
- Do not transport damaged WP munitions unless fully submerged in water.
- Avoid unnecessary movement of armed or damaged MEC.
- Avoid the forward portions of munitions employing proximity fusing.
- Assume unknown fuzes contain cocked strikers or anti-disturbance features.

J-5.1.2 Heavy Equipment

A portion of the work may involve the utilization of backhoes to perform excavation. Injuries can result from equipment hitting or running over personnel or from the overturning vehicles. Vehicle and heavy equipment design and operation will be in accordance with 29 Code of Federal Regulations (CFR) parts 1926.600 through 1926.602. In particular, the following precautions will be used to help prevent injuries:

- Brakes, hydraulic lines, light signals, fire extinguishers, fluid levels, steering, tires, horn, and other safety devices being checked by the vehicle operator at the beginning of each shift
- Cabs will be kept free of all nonessential items, and all loose items will be secured
- Glass in windshields, windows, and doors will be safety glass. Any cracked or broken glass will be replaced
- Backhoes will be provided with necessary safety equipment (seat belts, rollover protection, emergency shut-off in case of rollover, and backup warning lights and audible alarms)
- Blades and buckets will be lowered to the ground, and parking brakes will be set before shutting off any heavy equipment or vehicle
- Backhoes will not be backed up unless:
- The vehicle has a reverse signal alarm audible above the surrounding noise level
- The vehicle is backed up under the direction of a signalman
- The heavy equipment operator will be trained in the operation of the vehicle. Any person operating a motor vehicle will possess a permit valid for the equipment being used.

J-5.1.3 Excavation Safety

Prior to any excavation activity, efforts must be made to determine whether underground installations (i.e., sewers, telephone, water, fuel, electric lines, etc.) will be encountered and, if so, where such underground installations are located. The UXOSO or designee must contact the utility companies or owners involved and inform them, within established or customary local response times, of the proposed work. If the utility companies or owners do not respond within the period established by law or ordinance, or if they cannot identify the locations of utilities, the excavation may proceed with caution. In this situation, detection equipment or other safe and acceptable means to locate utilities may be used. If underground installations are exposed, Occupational Safety and Health Administration (OSHA) requires that they be removed, protected, or properly supported.

No protective system is needed if the excavation is made entirely in stable rock, or if workers enter an excavation that is less than 5 feet in depth (provided that the competent person, UXOSO, determines that there is no potential for a cave-in). If the depth of the excavation exceeds 5 feet than the sides of the excavation will slope to an angle not steeper than one and one-half horizontal to one vertical (34° measured from the horizontal). Access to and exit from an excavation must comply with the following conditions:

- Trenches 4 feet or more in depth should be provided with a fixed means of egress
- Spacing between ladders or other means of egress will be a minimum of 25 feet laterally
- Ladders must be secured and extend a minimum of 36 inches above the landing
- Metal ladders should not be used when electric utilities are present

J-5.1.4 Slip, Trip, and Fall Hazards

Slip, trip, and fall hazards may be encountered at the site including holes, pits, ditches, steep grades, and uneven grades. Personnel should use caution when traversing the site.

J-5.1.5 Power Tools

By their very nature, power tools have great capability for inflicting serious injury upon site personnel if they are not used and maintained properly. To control the hazards associated with power tool operation, the requirements outlined in EM 385-1-1 and the safe work practices listed below are observed when using power tools:

- Operations are conducted by authorized personnel familiar with the tool, its operation, and safety precautions. Power tools must be operated in accordance with the owner's manual
- Power tools are inspected prior to use and defective equipment is removed from service until repaired
- Power tools designed to accommodate guards have such guards properly in place prior to use

- Loose fitting clothing or long hair is not permitted around moving parts
- Hands, feet, etc., are kept away from all moving parts
- Maintenance and/or adjustments to equipment are not to be conducted while the equipment is in operation
- An adequate operating area is provided, allowing sufficient clearance and access for operation
- Personnel use required protective equipment, such as gloves, chaps, and steel-toed boots when using chainsaws

J-5.1.6 Confined Space Entry

Entry into permit-required confined spaces is not anticipated. Should entry into a permit-required confined space be required, the PHSM will be contacted to provide guidance and training.

J-5.2 Biological Hazards

Biological hazards that are usually found on site include ticks, spiders, poisonous snakes, vermin, and hazardous plants. Depending on the season and weather the hazards at the former Fort Ord will vary. For instance, during cold weather many animals and insects are not active and most plants are dormant. The project may continue through several seasons and the risks and hazards will change with the seasons. Employee awareness and the safe work practices outlined in the following paragraphs should reduce the risk associated with these hazards.

J-5.2.1 Hazardous Plants

A number of hazardous plants may be encountered during field operations. The ailments associated with these plants range from mild hay fever to contact dermatitis. Plants that present the greatest risk to site workers are those that produce allergic reactions and tissue injury.

Plants That Cause Skin and Tissue Injury

Contact with sharp leaves and thorns are of special concern to site personnel. This concern stems from the fact that punctures, cuts, and even minor scrapes caused by accidental contact may result in skin lesions and the introduction of fungi or bacteria through the skin. This is especially important in light of the fact that the warm moist environment created inside protective clothing is ideal for the propagation of fungal and bacterial infection. Personnel receiving any of the injuries listed above, even minor scrapes will report immediately to the UXOSO for continued observation and care. Keeping the skin covered as much as possible (i.e., long pants and long sleeved shirts) in areas where these plants are known to exist will limit much of the potential exposure.

Plants That Cause an Allergic Reaction

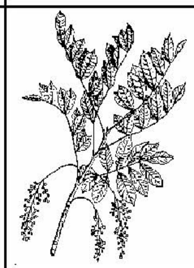
The poisonous plants of greatest concern are poison ivy, poison oak, and poison sumac (Figure J-1). Contact with the poisonous sap of these plants produces a severe rash characterized by redness, blisters, swelling, and intense burning and itching. The victim also may develop a high fever and may be very ill. Ordinarily, the rash begins within a few hours after exposure, but it may be delayed for 24 to 48 hours.

The most distinctive features of poison ivy and poison oak are their leaves, which are composed of three leaflets each. In certain seasons, both plants also have greenish-white flowers and berries that grow in clusters. Poison sumac is a tall shrub or small tree with 6 to 12 leaflets arranged in pairs with a single leaflet at the end. This plant grows in wooded, swampy areas. The reaction associated with exposure to these plants will generally cause the following signs and symptoms:

- Blistering at the site of contact, usually occurring within 12 to 48 hours after contact
- Reddening, swelling, itching, and burning at the site of contact
- Pain, if the reaction is severe
- Conjunctivitis, asthma, and other allergic reactions if the person is extremely sensitive to the poisonous plant toxin
- If the rash is scratched, secondary infections can occur. Preventive measures that are effective for most site personnel include:
- Avoid contact with any poisonous plants on site, and keep a steady watch to identify, report, and mark poisonous plants found on site
- Wash hands, face, or other exposed areas at the beginning of each break period and at the end of each workday
- Avoid contact with, and wash on a daily basis, contaminated tools, equipment, and clothing
- Barrier creams, detoxification/wash solutions and orally administered desensitization may prove effective and should be tried to find the best preventive solution

Keeping the skin covered as much as possible (i.e., long pants and long sleeved shirts) in areas where these plants are known to exist will limit much of the potential exposure.

Figure J-1
Poison Ivy / Poison Oak / Poison Sumac

Poison Ivy	Poison Oak	Poison Sumac
		

J-5.2.2 Tick Bites

The Center for Disease Control has noted the increase of Lyme Disease and Rocky Mountain Spotted Fever (RMSF), which are caused by bites from infected ticks that live in and near wooded areas, tall grass, and brush. Ticks are small, ranging from the size of a comma up to about one quarter inch and are sometimes difficult to see (Figure J-2). The tick season extends from spring through summer. When embedded in the skin, they may look like a freckle.

Figure J-2
Tick

Lyme disease has been documented in 43 states with the heaviest concentrations in the northeast (Connecticut, Massachusetts, New Jersey, New York, and Pennsylvania), the upper Midwest (Minnesota and Wisconsin), and along the northern California coast and more specifically, Monterey County. It is caused by deer ticks and lone star ticks that have become infected with spirochetes. Female deer ticks are about one quarter inch in size and are black and brick red in color. Male deer ticks are smaller and completely black. Lone star ticks are larger and chestnut brown in color.

RMSF has occurred in 36 states, with the heaviest concentrations in Oklahoma, North Carolina, South Carolina, and Virginia. It is caused by Rocky Mountain Wood Ticks and Dog Ticks that have become infected with rickettsia. Both are black in color.

The first symptoms of either disease are flu-like chills, fever, headache, dizziness, fatigue, stiff neck, and bone pain. If immediately treated by a physician, most individuals recover fully in a short period of time. If not treated, more serious symptoms can occur.

If you believe a tick has bitten you, or if any of the signs and symptoms noted above appears, contact the UXOSO, who will authorize you to visit a physician for an examination and possible treatment.

Protective Measures

Standard field gear (work boots, socks, and light-colored coveralls) provides good protection against tick bites, particularly if the joints are taped. However, even when wearing field gear, the following precautions will be taken when working in areas that might be infested with ticks:

- When in the field, check yourself often for ticks, particularly on your lower legs and areas covered with hair
- Spray outer clothing, particularly your pant legs and socks, BUT NOT YOUR SKIN, with an insect repellant that contains permethrin or permanone
- When walking in wooded areas wear a hard hat and avoid contact with bushes, tall grass, or brush as much as possible
- If you find a tick, remove it by pulling on it gently with tweezers. Do not squeeze the tick's body. Grasp it where the mouthparts enter the skin and tug gently, but firmly, until it releases its hold on the skin
- If the tick resists, cover the tick with salad oil/Vaseline for about 15 minutes to asphyxiate it, then remove it with tweezers
- DO NOT use matches, a lit cigarette, or nail polish or any other type of chemical to "coax" the tick out
- Be sure to remove all parts of the tick's body and disinfect the area with alcohol or a similar antiseptic after removal
- For several days to several weeks after removal of the tick, look for the signs of the onset of Lyme disease, such as a rash that looks like a bulls-eye or an expanding red circle surrounding a light area, frequently seen with a small welt in the center
- Also look for the signs of the onset of RMSF, such as an inflammation, which is visible in the form of a rash comprising many red spots under the skin, which appears 3 to 10 days after the tick bite

J-5.2.3 Insects

Contact with stinging insects may result in site personnel experiencing adverse health affects that range from being mildly uncomfortable to being life threatening. Therefore, stinging insects present a serious hazard to site personnel and extreme caution must be exercised whenever site and weather conditions increase the risk of encountering stinging insects. Poisonous insects and insect-like creatures that may be encountered at the former Fort Ord include the following:

- Bees ("Killer" bees, honeybees, bumblebees, wasps, hornets, and wingless wasps)
- Scorpions
- Fire ants

Bees

Personnel should be very cautious of "killer" bees. They have the appearance of the typical honeybee; however, they are very aggressive. These Africanized honeybees defend their colonies much more vigorously than typical bees. The colonies are easily disturbed (sometimes just by being nearby). When they do sting, many more bees may participate, so there is a danger of receiving more stings. This can make them life threatening, especially to people allergic to stings, or with limited capacity to escape (the young, old, and handicapped).

Scorpions

The scorpions commonly found in California have the capacity to inflict a painful sting, however, they are not considered to pose a danger to humans. Stings by these scorpions can be managed by washing the wound with soap and water and by application of an ice pack for a few minutes. Medical attention is usually not needed unless the victim is displaying signs of an allergic reaction (rash, severe swelling, shortness of breath).

Fire Ants

Fire ants are aggressive, reddish-brown to black ants that are 1/8 inch to 1/4 inch long. They construct nests, which are often visible as dome-shaped mounds of soil, sometimes as large as 3 feet across and 1 1/2 feet in height. In sandy soils, mounds are flatter and less visible. Fire ants usually build mounds in sunny, open areas such as lawns, pastures, cultivated fields, and meadows, but they are not restricted to these areas. Mounds or nests may be located in rotting logs, around trees and stumps, under pavement and buildings, and occasionally indoors.

Fire ants use their stingers to immobilize or kill prey and to defend ant mounds from disturbance by larger animals, such as humans. Any disturbance sends hundreds of workers out to attack anything that moves. The ant grabs its victim with its mandibles (mouthparts) and then inserts its stinger. The process of stinging releases a chemical, which alerts other ants, inducing them to sting. In addition, one ant can sting several times without letting go with its mandibles.

Once stung, humans experience a sharp pain that lasts a couple of minutes, then after a while the sting starts itching and a welt appears. Fire ant venom contains alkaloids and a relatively small amount of protein. The alkaloids kill skin cells; this attracts white blood cells, which form a pustule within a few hours of being stung. The fluid in the pustule is sterile, but if the pustule is broken, the wound may become infected. The protein in the venom can cause allergic reactions that may require medical attention.

Some of the factors related to stinging insects that increases the risk associated with accidental contact are:

- The nests for these insects are frequently found in remote wooded or grassy areas and hidden in cavities
- The nests can be situated in trees, rocks, bushes or in the ground, and are usually difficult to see
- Accidental contact with these insects is highly probable, especially during warm weather conditions when the insects are most active
- If a site worker accidentally disturbs a nest, the worker may be inflicted with multiple stings, causing extreme pain and swelling which can leave the worker incapacitated and in need of medical attention
- Some people are hypersensitive to the toxins injected by a sting, and when stung, experience a violent and immediate allergic reaction resulting in a life-threatening condition known as anaphylactic shock
- Anaphylactic shock manifests itself very rapidly and is characterized by extreme swelling of the body, eyes, face, mouth, and respiratory passages
- The hypersensitivity needed to cause anaphylactic shock, can in some people, accumulate over time and exposure; therefore, even if someone has been stung previously, and not experienced an allergic reaction, there is no guarantee that they will not have an allergic reaction if they are stung again
- With these things in mind, and with the high probability of contact with stinging insects, all site personnel will comply with the following safe work practices:
- If a worker knows that he is hypersensitive to bee, wasp, or hornet stings, he must inform the UXOSO of this condition prior to participation in site activities
- All site personnel will be watchful for the presence of stinging insects and their nests, and will advise the UXOSO if a stinging insect nest is located or suspected in the area
- Any nests located on site will be flagged off and site personnel will be notified of its presence
- If stung, site personnel will immediately seek shelter and stay there even if some bees come in with you (there are more outside the building or car). Do not jump in water (bees will still be in the area when you come up). Once safe, remove stings from your skin, it does not matter how you do it, but do it as quickly as possible to reduce the amount of venom they inject. Obtain first aid treatment and contact the UXOSO who will observe for signs of allergic reaction

- Site personnel with a known hypersensitivity to stinging insects will keep required emergency medication on or near their person at all times

J-5.2.4 Snakes

Snakes like to sun themselves on rocks during the day. Therefore, when site activities are conducted, extreme caution must be exercised around areas where snakes might be found (i.e., rocks, bushes, logs, or in holes, crevices, or abandoned pipes). The rattlesnake is the only type of snake in California that is dangerous to humans. These snakes are normally not aggressive and will flee when humans approach. However, if a rattlesnake is encountered, leave the area and report the location to UXOSO. The UXOSO will issue protective clothing, such as snake leggings, to site personnel.

Western Rattlesnake

This is the only rattlesnake that can be encountered in Northern California. Its venom, which it uses to immobilize its prey and defend itself, contains both neurotoxins and hemotoxins. Neurotoxins affect the nervous system and hemotoxins affect the bloodstream. Its size can vary between 1.25 and 5.25 feet and can be identified by brownish blotches down midline of back; generally edged with dark brown or black. The snake is most active between the months of April and October.

Treatment

A snake bite is usually characterized by extreme pain and swelling at the site of the bite; the presence of one or more puncture wounds created by the fangs; and a general skin discoloration. The manifestations of the bite include general weakness, rapid pulse, nausea and vomiting, shortness of breath, dimness of vision, tingling or numbness of the tongue, mouth or scalp, and shock.

Physical reactions are aggravated by acute fear, anxiety, the amount of venom injected, the speed of absorption of venom into the victim's circulation, the size of the victim, protection provided by clothing (including shoes and gloves), the amount of time before anti-venom therapy, and location of the bite.

First Aid

The rules to follow for a snake bite are:

- DO NOT cut "Xs" over the bite area, as this will intensify the effect of the venom
- DO NOT apply suction to the wound since this has a minimal effect in removing venom
- DO NOT apply a tourniquet since this will concentrate the venom and increase the amount of tissue damage in the immediate area
- DO NOT use cold compresses, ice, dry ice, chemical ice packs, spray refrigerants, or other methods of cold therapy

- If possible, try to get a good look at the snake so it can be identified for proper selection of anti-venom
- DO NOT allow the victim to run for help since running increases the heart rate and will increase the spread of the venom throughout the body
- Reassure and keep the victim calm, quiet, and immobile. Do not delay evacuation
- Have the victim hold the affected extremity lower than the body while waiting for medical assistance
- Transport the victim to medical attention immediately

Identification Features

Nonpoisonous snakes are often erroneously identified as poisonous. The following features in Table J-1 will assist in properly identifying a snake as poisonous or nonpoisonous.

Table J-1
Snake Identification Features

Feature	Poisonous	Nonpoisonous
Eye Pupils	Elliptical or cat-like	Round
Sensing Pits	Pit between the eyelids and nostrils	No pit between the eyelids and nostrils
Teeth	Two enlarged teeth (fangs) in front of the upper jaw	All teeth are approximately the same size
Scales	Form a single row on the underside and below the tail	Arranged in a double row on the underside of the tail
Head	Head much wider than the neck	Head slightly wider than the neck
Tail	Single anal plate	Divided anal plate

J-5.2.5 Spiders

A large variety of spiders may be encountered during site activities. Extreme caution must be used when lifting logs and debris, since spiders are typically found in these areas.

While most spider bites merely cause localized pain, swelling, reddening, and in some cases, tissue damage, there are a few spiders that, due to the severity of the physiological affects caused by their venom, are dangerous. The UXOSO will brief site personnel as to the identification and avoidance of these dangerous spiders. These species include the black widow and the brown or violin spiders.

The black widow is a coal-black bulbous spider 3/4 to 1 1/2 inches in length, with a bright red hourglass on the underside of the abdomen (Figure J-3). The black widow is usually found in dark, moist locations, especially under rocks, rotting logs, and may even be found in outdoor toilets where they inhabit the underside of the seat. Victims of a black widow bite may exhibit the following signs or symptoms:

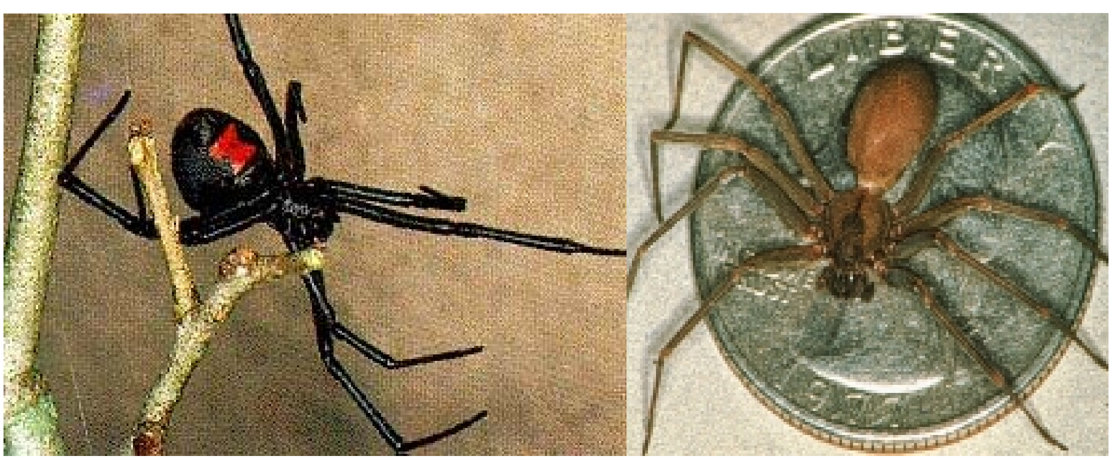
- Sensation of pinprick or minor burning at the time of the bite
- Appearance of small punctures (but sometimes none are visible)
- After 15 to 60 minutes, intense pain is felt at the site of the bite which spreads quickly, and is followed by profuse sweating, rigid abdominal muscles, muscle spasms, breathing difficulty, slurred speech, poor coordination, dilated pupils, and generalized swelling of face and extremities

The brown or violin spider is brownish to tan in color, rather flat, and 1/2 to 5/8 inches long (Figure J-3). However, unlike the typical species, the ones encountered at the former Fort Ord do not have a violin or “fiddle” shaped mark on the top of the head. Of the brown spider, there are three varieties found in the United States that present a problem to site personnel. These are the brown recluse, the desert violin, and the Arizona violin. The brown recluse spider has not been reported at or near the project area (Vetter 1999). These spiders may be found in a variety of locations including trees, rocks, or in dark locations. Victims of a brown or violin spider bite may exhibit the following signs or symptoms:

- Blistering at the site of the bite, followed by a local burning at the site 30 to 60 minutes after the bite
- Formation of a large, red, swollen, pustulating lesion with a bull's-eye appearance
- Systemic affects may include a generalized rash, joint pain, chills, fever, nausea, and vomiting
- Pain may become severe after 8 hours, with the onset of tissue necrosis

There is no effective first aid treatment for either of these bites. Except for very young, very old, or weak victims, spider bites are not considered to be life threatening. However, medical treatment must be sought to reduce the extent of damage caused by the injected toxins.

Figure J-3
Spiders



First aid should include:

- If possible, catch the spider to confirm its identity. Even if the body is crushed, save it for identification
- Clean the bitten area with soap and water or rubbing alcohol
- To relieve pain, place an ice pack over the bite
- Keep the victim quiet and monitor breathing
- Seek immediate medical attention

J-5.2.6 Rats, Mice, and Bats

Rats, mice, and bats may be found at the site. These animals may carry rabies and should be avoided. In addition, Hantavirus is also a concern when coming in contact with these animals. Hantavirus is a disease spread primarily from infected rodent droppings. Hantavirus results from intimate contact with rodents, such as may occur in agricultural areas with dense human and rodent populations or during soil excavation. Hantavirus is not transferred from person to person. The overwhelming evidence is that spread is from rodent to humans through contact with infected rodent secretions or airborne transmission by infected dust particles.

Preventive measures should focus on cleaning all cuts and scratches with soap and water, followed by rinsing with hydrogen peroxide. Put liquid skin on the affected areas. The best preventative measure is to avoid all rodent nests during geophysical surveys. If rodent nests are discovered, field team members should be apprised of their locations and avoid working adjacent to the nests. If work must be performed at that location, a 10 percent bleach solution will be sprayed on the nest and adjacent areas to kill the virus. If work must be performed at a location where rodent infestation is evident personal protective equipment should be worn in accordance with the SOP for Hantavirus Exposure Protection presented in Appendix D of the G1 SAP. The PPE ensemble will include:

- Half-face air purifying respirator with high efficiency particulate air filter cartridges (N/P/R99, 100) and non-vented goggles or high filtration dust mask with non-vented goggles
- Tyvek coveralls
- Tyvek boot covers or rubber boots
- PVC or latex gloves

J-5.2.7 Bloodborne Pathogens

Bloodborne pathogens enter the human body and blood circulation system through punctures, cuts, or abrasions of the skin or mucous membranes. They are not transmitted through ingestion (swallowing), through the lungs (breathing), or by contact with whole, healthy skin. Examples of bloodborne pathogens are HIV, Hepatitis B, Malaria, Syphilis, and West Nile Virus. However, under the principle of universal precautions all blood should be considered infectious, and all skin and mucous membranes should be considered to have possible points of entry for pathogens.

Potential blood borne pathogen exposures that employees might face include:

- Contact with contaminated medical equipment or medical waste or sharp instruments
- Medical emergency response operations such as administering first aid or cardiopulmonary resuscitation (CPR)
- Contact with human wastes such as domestic sewage

J-5.3 Physical Hazards

Physical hazards that exist at the former Fort Ord include noise, heat and cold stress, and fire hazards. Procedures to protect workers from these hazards are presented below.

J-5.3.1 Noise Induced Hearing Loss

Planned activities will involve the use of heavy equipment, such as backhoes and generators. The unprotected exposure of site workers to this noise during activities can result in noise-induced hearing loss. Personnel working at this site will be enrolled in a hearing conservation program. The UXOSO will verify that each site worker has received hearing conservation training that entails proper use of hearing protectors. Additionally, the UXOSO will ensure that either earmuffs or disposable foam earplugs are made available to, and used by, all personnel near operating heavy equipment, or other sources of high intensity noise. Hearing protection is required any time the noise level reaches 85 dbA or greater. Double protection is required any time noise levels exceed 104 dbA.

Noise monitoring will be accomplished by field determination. If a person speaking in a normal voice cannot be heard at a minimum 3-foot distance, then hearing protection will be required.

J-5.3.2 Heat Stress

Heat stress is one of the most common (and potentially serious) illnesses that affect site workers. When site personnel are engaged in operations in hot environments, a number of physiological responses can occur which may seriously affect the health and safety of the workers. These affects can be eliminated or controlled through the use of a comprehensive heat stress prevention and monitoring program.

Individuals vary in their susceptibility and degree of response to stress induced by increased body heat. Heat stress can result in health effects ranging from transient heat fatigue to serious illness or death. Heat stress is cause by a number of interacting factors including environmental condition, clothing, workload, and the individual characteristics of the worker. Because heat stress is probably one of the most common (and potentially serious) illnesses at

MEC sites, regular monitoring and other preventive precautions are vital. Factors that may predispose a worker to heat stress include:

- Lack of physical fitness
- Lack of acclimatization to hot environments
- Degree of hydration
- Obesity
- Current health (i.e., having an infection, chronic disease, diarrhea, etc.)
- Alcohol or drug use
- The worker’s age and sex

The amount and type of PPE worn influence the worker’s heat tolerance. PPE adds weight and bulk, severely reduces the body’s access to normal heat exchange mechanisms (evaporation, convection, and radiation), and increases energy expenditure. Therefore, when selecting PPE, each item’s benefit should be carefully evaluated in relation to its potential for increasing the risk of heat stress. Once PPE is selected, the safe duration of work/rest periods should be determined based on:

- Anticipated work rate
- Ambient temperature and other environmental factors
- Type of protective ensemble
- Individual worker characteristics and fitness

Sweating does not cool the body unless moisture is removed from the body. The use of PPE reduces the body's ability to eliminate large quantities of heat because the evaporation of sweat is decreased. The body's effort to maintain an acceptable temperature may become impaired and this may cause heat stress. Increased body temperature and physical discomfort also promote irritability and a decreased attention to the performance of hazardous tasks. At the former Fort Ord sites, Level D PPE will be utilized, thus providing minimal increase in the potential for heat stress. Level D PPE is defined as standard work clothes with long pants, hard-hat (when overhead hazard is present), and safety boots (when working around heavy equipment).

Early Symptoms of Heat Stress

The early symptoms used to recognize heat-related illnesses include:

- Decline in task performance
- Lack of coordination
- Decline in alertness
- Unsteady walk

- Excessive fatigue
- Muscle cramps
- Dizziness

Heat Stress Disorders

The following paragraphs outline the major heat-related illnesses that may result from exposure to high heat environments, which include heat rash, fainting, heat cramps, heat exhaustion, and heat stroke (Table J-2). For the purpose of this program, reference to “liquids” will indicate the use of water or an electrolyte replacement solution.

Heat Rash

Heat rash is caused by continuous exposure to heat and humid air and is aggravated by wet chafing clothing. This condition can decrease a worker’s ability to tolerate hot environments. Symptoms include a mild red rash, especially in areas of the body that sweat heavily. Treatment of heat rash entails decreasing the amount of time in protective gear and using baby powder to absorb moisture and decrease chafing. Maintain good personal hygiene standards and change into dry clothes as needed.

Heat Cramps

Heat cramps are caused by a profuse rate of perspiration that is not balanced by adequate fluid and electrolyte intake. The occurrence of heat-related cramps is often an indication that excessive water and electrolyte loss has occurred, which can further develop into heat exhaustion or heat stroke. Symptoms include acute, painful spasms of voluntary muscles such as the back, abdomen, and extremities. Treatment involves moving victim to a cool area and loosening restrictive clothing. Stretch and massage affected muscles to increase blood flow to the area. Have patient drink one to two cups of liquids immediately with fluid intake repeated every twenty minutes thereafter. Consult with physician if condition does not improve. If available, an electrolyte replacement solution should be consumed.

Heat Exhaustion

Heat exhaustion occurs due to the large fluid and salt loss from profuse sweating. It is a state of very definite weakness or exhaustion caused by increased stress on various organs to meet increased demands to cool the body from excessive loss of fluids. This condition leads to inadequate blood supply and cardiac insufficiency. Heat exhaustion is less dangerous than heat stroke, but nonetheless must be treated. If allowed to go untreated, heat exhaustion can quickly develop into heat stroke. Symptoms include: pale and moist skin, profuse perspiration, and extreme weakness. Body temperature is basically normal or slightly elevated. The worker's pulse is weak and rapid, and breathing is often shallow. The individual may have a headache or experience nausea. Treatment for heat exhaustion involves removing the individual to a cool, air-conditioned place, loosening the persons clothing, and elevating the victim’s feet. Consult a physician, especially in severe cases. Have patient drink one to two cups of liquids immediately, and repeat every twenty minutes thereafter. Total liquid consumption should be about one to two gallons per day. If the signs and symptoms of heat exhaustion do not subside, or become more severe, medical attention will be required.

Heat Stroke

Heat stroke is an acute and dangerous reaction to heat stress caused by failure of the heat regulating mechanisms of the body. The failure of the individual’s temperature control system causes the perspiration system to stop working correctly. When this occurs, the body core temperature rises very rapidly to a point (+105°F) where brain damage and death will result if the person is not cooled quickly. The victim’s skin is hot and often dry. Other symptoms include confusion; extremely high body temperature; rapid respiratory and pulse rate; delirium; convulsions; unconsciousness or coma.

Cool the victim immediately. If the body temperature is not brought down quickly, permanent brain damage or death may result. The victim should be moved to a shady area; he should lie down and keep head elevated. Cool the victim by either sponging or immersing the victim in very cool water to reduce the core temperature to a safe level (<102°F). If conscious, give the victim cool liquids to drink. Observe the victim and obtain immediate medical help. Do not give the victim caffeinated or alcoholic beverages. Heat stroke is considered a medical emergency. Medical help should be summoned immediately. **Early recognition and treatment of heat stroke are the only means of preventing brain damage or death.**

Preventive Measures

Proper training and preventive measures will help avert serious illness and loss of work productivity. Preventing heat stress is particularly important because once someone suffers from heat exhaustion, that person may become predisposed to additional heat injuries. In order to avoid heat-related illnesses, proper preventive measures will be implemented whenever environmental conditions dictate the need, normally whenever the temperature reaches at least 75°F. These preventive measures represent the minimal steps to be taken and will include the following procedures:

- The UXOSO will examine each site worker prior to the start of daily operations, and periodically throughout the day, to determine the individual’s susceptibility to heat induced stress. Evidence of extreme dehydration may require the UXOSO to restrict the worker’s activities until such time as the worker is fit for duty. Personnel identified as being at high risk (obese, using diuretics, etc.) for heat stress that are allowed to participate in site operations will be monitored frequently by the UXOSO
- Site workers will be trained to recognize and treat heat-related illnesses. This training will include recognizing the signs and symptoms of heat stress disorders and knowing proper treatment
- In order to maintain workers’ body fluids at normal levels, workers will be encouraged to drink, as a minimum, approximately sixteen ounces of liquids prior to start of work in the morning, after lunch and prior to leaving the site at the conclusion of the day’s activities. Disposable four (4) to twelve (12) ounce cups and liquids will be provided on site.

Liquids to be provided will include water and an electrolyte replacement solution, with the intake of each being equally divided. Liquids containing caffeine are to be avoided

- When ambient conditions and site workload requirements dictate, as determined by the UXOSO, workers will be required to drink a minimum of 16 to 32 ounces of liquids during each rest cycle. The normal thirst mechanism is not sensitive enough to ensure that enough water will be ingested to replace lost sweat. When heavy sweating occurs, workers will be encouraged to drink even though they may not be thirsty
- A shelter or shaded area will be provided where workers may be protected from direct sunlight during rest periods
- Monitoring of ambient or physiological heat stress indices will be conducted to allow prevention and early detection of heat induced stress. Monitoring will be conducted in accordance with applicable paragraphs of this SSHP
- Site workers will be given time to acclimatize to site work conditions, temperature, protective equipment, and workload. Acclimatization is the adaptive process that results in a decrease of the physiological response produced by the application of a constant environmental stress. On initial exposure to a hot environment, there is an impaired ability to work and evidence of physiological strain. If the exposure is repeated on several successive days, there is a gradual return of the ability to work and a decrease in physiological strain. Acclimatization usually takes two to six days of continued work in hot environments, and allows the worker’s body to become adjusted to this level and type of work. This process involves a gradual increase in the workload over the required period, the length of which depends upon the nature of the work performed, the ambient temperatures, and the individual’s susceptibility to heat stress. The results of acclimatization include: subjective discomfort practically disappears; body temperature and heart rate are lower; there is a more stable blood pressure; and the sweat is more profuse and dilute
- Work schedules will be adjusted as follows:
- Modify work/rest schedules according to monitoring requirements
- Mandate work slowdowns as needed
- Rotate personnel: alternate job functions to minimize over-stress or overexertion at one task
- Add additional personnel to work teams
- Perform work during cooler hours of the day if possible
- Workers will be encouraged to achieve and maintain an optimum level of physical fitness. Increased physical fitness will allow workers to better tolerate and respond to hot environments and heavy workloads. In comparison to an unfit person, a fit person will have: less physiological strain, a lower heart rate and body temperature, and a more efficient sweating mechanism
- Alcohol should not be consumed in a hot environment because the loss of body fluids increases the risk of heat stress

Heat Stress Monitoring

Heat stress prevention is important, because once a person suffers from heat stroke or heat exhaustion, that person may be more likely to have additional heat-related illnesses (Table J-3).

The following steps to prevent heat stress should be followed:

- Provide air conditioned shelter or shaded areas to protect personnel during rest periods
- Urge workers to drink water to keep their body fluids at normal levels
- Adjust work schedules according to monitoring requirements and perform work during cooler hours of the day. The normal work schedule consists of a 10-hour day, four days per week
- Provide accurate verbal and written instructions, frequent training programs, and other information about heat stress and strain
- Permit self-limitation of exposures and encourage co-worker observation to detect signs and symptoms of heat strain in others
- Counsel and monitor those who take medications that may compromise normal cardiovascular, blood pressure, body temperature regulation, renal, or sweat gland functions; and those who abuse or are recovering from the abuse of alcohol or other intoxicants
- Encourage healthy life-styles, ideal body weight, and electrolyte balance
- Adjust expectations of those returning to work after absence from hot exposure situations and encourage consumption of salty foods (with approval of physician if on a salt-restricted diet)
- Ensure workers have current medical screening to identify those susceptible to systemic heat injury

Table J-2
Signs and Symptoms of Heat Stress

Illness	Cause	Signs and Symptoms
Heat Rash	May result from continuous exposure to heat or humid air	Red rash on skin, intense itching and inflamation
Heat Cramps	Caused by heavy sweating with inadequate electrolyte replacement	Muscle spasms; pain in the hands, feet, and abdomen
Heat Exhaustion	Occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration	Pale, cool, moist skin; heavy sweating; dizziness; nausea; fainting
Heat Stroke	Most serious form of heat stress; temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occur; competent medical help must be obtained	Red, hot, usually dry skin; lack of or reduced perspiration; nausea; dizziness and confusion; strong, rapid pulse; coma

Table J-3
Suggested Frequency for Monitoring Fit and Acclimatized Workers [a]

Adjusted Temperature [b]	Normal Work Ensemble [c]	Impermeable Ensemble
90ºF (32.2ºC) or above	After each 45 minutes of work	After each 15 minutes of work
87.5º-90ºF (30.8º- 32.2ºC)	After each 60 minutes of work	After each 30 minutes of work
82.5º-87.5ºF (28.1º- 30.8ºC)	After each 90 minutes of work	After each 60 minutes of work
77.5º-82.5ºF (25.3º-28.1ºC)	After each 120 minutes of work	After each 90 minutes of work
72.5º-77.5ºF (22.5º- 25.3ºC)	After each 150 minutes of work	After each 120 minutes of work

Reference: NIOSH/OSHA/USCG/EPA 1985.

a. For work levels of 250 kilocalories/hour.

b. Calculate the adjusted air temperature (ta adj) by using the equation: ta adj = ta + (13 x percent sunshine), where: ta is the air temperature in ºF. Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow (100 percent sunshine = no cloud cover and a sharp, distinct shadow; zero percent sunshine = no shadows.)

c. A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

For temperatures above 70°F (21°C), heat stress monitoring will be initiated for workers wearing semi-permeable or impermeable clothing. The monitoring will be as follows:

Heart rate: Count the radial pulse during a 30-second period as early as possible in the rest period.

- If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.
- If the heart rate still exceeds 110 beats per minute at the next rest period, shorten the following work cycle by one-third.

J-5.3.3 Cold-related Illnesses

If work on this project is conducted in the winter months, thermal injury due to cold exposure can become a problem for field personnel. Work will cease under unusually hazardous conditions (e.g., wind-chill less than 0°F, or wind-chill less than 10°F with precipitation). Systemic cold exposure is referred to as hypothermia. Local cold exposure is generally labeled frostbite. Recognition of the symptoms of cold-related illness will be discussed during the health and safety briefing conducted prior to the onset of site activities. Refer to the 2000 American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) for Chemical Substances and Physical Agents and Biological Exposure Indices for additional information on cold stress prevention, monitoring, and protective measures.

Hypothermia

Hypothermia is a life-threatening condition in which the core body temperature falls below 95°F. Hypothermia can occur at temperatures above freezing, particularly when the skin or clothing becomes wet. During exposure to cold, maximum shivering occurs when the core temperature falls to 95°F (Table J-4). As hypothermia progresses, depression of the central nervous system becomes increasingly more severe. This accounts for the progressive signs and symptoms ranging from sluggishness and slurred speech to disorientation and eventually unconsciousness. The ability to sustain metabolic rate and to reduce skin blood flow is diminished by fatigue. Thus, fatigue increases the risk of severe hypothermia by decreasing metabolic heat. Additionally, because blood flow through the skin is reduced to conserve heat, the skin and underlying tissues become more susceptible to frostbite.

Table J-4
Progressive Clinical Symptoms of Hypothermia

Core Temperature (F)	Clinical Signs
95°	Maximum shivering
87° - 89°	Consciousness clouded; blood pressure becomes difficult to obtain; pupils dilated
84° - 86°	Progressive loss of consciousness; muscular rigidity; respiratory rate decreases
79°	Victim rarely conscious
70° - 72°	Maximum risk of ventricular fibrillation

Frostbite

Frostbite is both the general and medical term given to areas of cold injury. Unlike hypothermia, frostbite rarely occurs unless environmental temperatures are less than freezing and usually less than 20°F. Frostbite injuries occur most commonly on the distal parts of the body (nose, earlobes, hands, and feet) that are subject to intense vasoconstriction. The three general categories of frostbite are:

- Frostnip - A whitened area of the skin, which is slightly burning or painful
- Superficial frostbite - Waxy, white skin with a firm sensation but with some resiliency. Symptomatically feels "warm" to the victim with a notable cessation of pain
- Deep frostbite - Tissue damage deeper than the skin, at times, down to the bone. The skin is cold, numb, and hard

Preventing Cold-related Illnesses

Educate worker to recognize the symptoms of frostbite and hypothermia:

- Ensure the availability of an enclosed, heated environment within the vehicles. The nearest heated environment will be the interior of the vehicles at the site
- Ensure the availability of dry changes of clothes
- Record temperature readings
- Ensure the availability of warm beverages, preferably noncaffeinated

Cold Weather Monitoring and Hypothermia

Hypothermia is defined as a decrease in the body core temperature below 96°F (36°C). The following symptoms appear (in the order listed) as the body loses heat faster than it can be produced:

- Voluntary exercise to stay warm
- Involuntary exercise to stay warm (shivering)
- Loss of judgment and reasoning abilities
- Feelings of apathy, listlessness, and indifference
- Loss of control of the hands

The following steps should be taken to prevent hypothermia:

- Educate workers to recognize the symptoms of frostbite and hypothermia
- Identify and limit known risk factors
- Ensure the availability of dry changes of clothes
- Develop a capability for temperature recording at the site
- Ensure the availability of warm drinks

Monitoring the oral temperature on the job site can also be used to defend against hypothermia. This should be done at the supervisor's discretion based on changes in the worker's performance or mental status, or when the wind-chill is less than 20°F (-7°C), or a wind-chill is less than 30°F (-2°C) with precipitation. Any worker developing moderate hypothermia, defined as a core temperature of 92° (34°C), may not return to work for 48 hours.

J-5.3.4 Fire Hazards

Although fires and explosions may arise spontaneously they are more commonly the result of carelessness during the conduct of site activities, such as moving drums, mixing/bulking of site chemicals, and during refueling of heavy or handheld equipment. Some potential causes of explosion and fires include:

- Mixing of incompatible chemicals, which cause reactions that spontaneously ignite due to the production of both flammable vapors and heat
- Ignition of explosive or flammable chemical gases or vapors by external ignition sources
- Ignition of materials due to oxygen enrichment
- Agitation of shock or friction-sensitive compounds
- Sudden release of materials under pressure

Fire Prevention

Explosions and fires not only pose the obvious hazards of intense heat, open flames, smoke inhalation, and flying objects, but may also cause the release of toxic chemicals into the environment. Such releases can threaten both personnel on site and members of the general public living or working nearby. Site personnel involved with potentially flammable material or operations must follow the guidelines listed below and EM 385-1-1, Section 9, to prevent fires and explosions:

- Potentially explosive/flammable atmospheres involving gases or vapors will be monitored using a combustible gas indicator
- Prior to initiation of site activities involving explosive/flammable materials all potential ignition sources must be removed or extinguished
- Non-sparking and explosion-proof equipment must be used whenever the potential for ignition of flammable/explosive gases/vapors/liquids exists
- Dilution or induced ventilation may be used to decrease the airborne concentration of explosive/flammable atmospheres
- Smoking is restricted to designated areas on MEC work sites
- Flammable and/or combustible liquids must be handled only in approved and properly labeled metal safety cans equipped with flash arresters and self-closing lids
- Transfer of flammable liquids from one metal container to another will be done only when the containers are electrically interconnected (bonded)
- The motors of all equipment being fueled will be shut off during the fueling operations
- Metal drums used for storing flammable/combustible liquids will be equipped with self-closing safety faucets, vent bung fittings, grounding cables and drip pans, and will be stored outside buildings in an area approved by the UXOSO

Fire Protection

The following safe work practices are to be used to protect against fires:

- Vehicles and equipment will not be fueled while running
- Flammable/combustible liquid storage areas have at least one 4A:20:B:C fire extinguisher located within 25-75 feet and marked with the appropriate fire symbol and no smoking signs
- All vehicles used in the transport of explosives are equipped with two fire extinguishers of not less than 2A:10B:C or higher, with one fire extinguisher mounted/placed inside the cab of the vehicle and one mounted outside, by the driver’s side door, if possible
- Temporary offices will be equipped with a fire extinguisher of not less than 10:ABC
- At least one portable fire extinguisher having a rating of not less than 4A:20B:C will be located at each work site

J-5.3.5 Ionization Radiation

No radiological hazards are anticipated during operations at the former Fort Ord. If any radioactive sources are encountered by the ESCA RP Team personnel or their subcontractors work at that location will be stopped and the PHSM will be contacted to provide guidance on proper protective measures.

J-5.4 Chemical Hazards

Non-Chemical-Warfare-Material chemical hazards, such as lead-contaminated soils or lead-based paint, may be anticipated at former small arms ranges or during demolition of existing structures. Should contaminated soils be encountered, the PHSM will be contacted to provide guidance on appropriate safety precautions.

Chemical Warfare Munitions

Chemical Munitions, Chemical Warfare Material, or Radiological Contamination is not anticipated to be encountered during operations on the former Fort Ord; however, should personnel encounter a suspected toxic chemical munitions, Chemical Warfare Material, or any situation where radiological contamination could become a concern, all personnel will immediately withdraw upwind to a safe location outside of the fragmentation zone of the type ordnance located and contact the UXOSO who will notify the appropriate agencies.

The site will be secure with two UXO Technicians (minimum of one UXO Technician II and one UXO Technician I) until the arrival of the Technical Escort Unit (TEU) or Military EOD. The ESCA RP Team will assist the TEU as directed. Decontamination station setup and operation will be performed by fire department hazardous response personnel.

Ordnance Fillers

In the event of locating a Livens Projector, 4-inch Stokes, or a 4.2-inch mortar and positive identification of the filler remains unknown, the item will be left in place awaiting disposition by TEU who will identify the filler prior to final disposition. Activities related to ordnance with unknown fillers will be conducted in accordance with the SOP for MEC with Unknown Filler presented in Appendix D.

J-5.5 Hazard Analysis

The ESCA RP Team has analyzed the scope of work tasking to determine the work risk hazards associated with each task. The tasks consist of direct tasks and implied tasks, or sub tasks, to accomplish the work. Table 6-7 presents each activity, the associated hazards, and the control measures planned to prevent accidents.

J-6.0 MEDICAL MONITORING

Personnel engaged in field activities must be enrolled in a medical surveillance program as required by 29 CFR Part 1910.120(f). Doctors on Duty, 2260 North Fremont Street, (831) 372-6700, is used to provide the medical examinations for WESTON personnel. Qualisys Medical Network Services, 4501 Circle 75 Parkway, Suite C-3250, Atlanta, Georgia, (770) 226-9944, provides medical surveillance and records management. The content of the examination must be designed to determine each individual's fitness for duty, including ability to work while wearing protective equipment (e.g., respirator, impermeable clothing, etc.).

Personnel performing on-site field activities on this project must present to the UXOSO a physician's certification of completion of a comprehensive medical monitoring examination within the 12 months prior to the beginning of field activities. Additionally, the UXOSO will ensure that workers remain current in their medical monitoring throughout the duration of the project.

J-7.0 TRAINING

All personnel performing field activities at former Fort Ord sites must have received 40 hours of initial hazardous waste operations and emergency response (HAZWOPER) health and safety training (or have equivalent training) in accordance with the provisions of 29 CFR 1910.120(e)(3) and must be current in their refresher training. Site supervisors responsible for personnel engaged in field activities must have attended a site management training as required by OSHA in 29 CFR 1910.120(e)(4). At least one member of each field team must be current in first aid and CPR training. Copies of training certificates will be provided to the UXOSO.

Exceptions to the HAZWOPER requirements will be reviewed and determined by the UXOSO. There may be field personnel (either subcontractors or ESCA RP Team employees) who are required for certain field activities, but who have not received 40-hour HAZWOPER training or are not current (i.e., have not taken the 8-hour refresher within the prior 12 month period) with respect to the 40-hour HAZWOPER training; they may perform fieldwork at the site if the following conditions are adhered to:

1) They have proof from a Medical Physician that identifies their fitness to perform field services. They do not have to meet medical monitoring requirements.
2) They are in compliance with all other provisions in the applicable SSHP.
3) They have submitted a signed acknowledgement that they have read and understand the applicable SSHP.
4) The specific work to be performed is defined in advance.
5) The period during which they will perform the work is limited and specified in advance.
6) They will conduct fieldwork only under the direct supervision of and accompanied in the field by an LFR Inc. (LFR) or WESTON employee who is current on the 40-hour HAZWOPER training.
7) They have received UXO Recognition Training in advance of the field effort.
8) They have received LFR’s Environmental Awareness Training.
9) The operation does not involve employee exposure or the reasonable possibility for employee exposure to safety or health hazards.

J-7.1 Site-Specific Training

In addition to the 40-hour initial training and 8-hour refresher training, site-specific training will be conducted. The UXOSO is responsible for developing a site-specific occupational hazard training that will be provided to all ESCA RP Team personnel and subcontractors prior to the start of field operations, as required. This training will cover the following topics:

- Names of personnel responsible for site safety and health
- Safe work practices
- Site history
- Safety, health, and other hazards at site
- Work zones and other locations
- Emergency procedures, evacuation routes, emergency phone numbers
- Personal protective equipment for anticipated task
- Safe use of engineering controls and equipment on the site
- Blood borne pathogens
- Ordnance recognition and reporting
- Prohibitions in areas and zones, including:
- Site layout
- Procedures for entry and exit of work areas and zones

In addition, site specific training may include Lead Awareness Training.

J-7.2 Tailgate Safety Meetings

The SUXOS will conduct tailgate safety briefings for field personnel. This training must as a minimum cover the following topics:

- Tasks to be performed
- Hazards that may be encountered, including their effects, how to recognize symptoms or monitor them, or danger signals
- Emergency procedures (emergency equipment, emergency communications, and route to hospital)
- Rallying Points and safe refuge areas

J-7.3 Supervisor Meetings

Weekly meetings will be held for all supervisors. The agenda will include the past week's operations, safety issues/problems, corrective actions required or taken, and the upcoming week's activities.

J-7.4 Training Documentation

The UXOSO will maintain copies of training certificates (HAZWOPER, EOD School Certificate, and CPR/first aid) for personnel participating in field operations. The UXOSO will document site-specific initial training, lead awareness training, tailgate training/subjects, and any other special or additional training.

J-7.5 Hazard Communication Training

All project work will be conducted in accordance with standard policies for hazard communication. Copies of MSDSs for any hazardous chemicals brought on site will be maintained at the field office. Employees that are exposed to hazardous chemicals brought to the site must receive training on:

- The physical and health hazards of the chemicals in the work area
- Methods and observations that may be used to detect the presence or release of the hazardous chemicals in the work area
- The measures a worker can take to protect themselves from these hazards

J-7.6 Bloodborne Pathogens Training

Personnel working on this project will be provided blood borne pathogen training review. This training will be given initially at the same time as the site-specific training. The topics covered in the training will include the following:

- An overview of the Blood Borne Pathogen Standard
- Epidemiology and symptoms of blood borne diseases
- Modes of transmission of blood borne pathogens
- Discussion of Exposure Control
- Tasks that may involve exposure to blood and other potentially infectious materials
- Review of the methods that will prevent or reduce exposure
- Selection and use of PPE
- Information on the post-exposure evaluation and follow-up program

J-7.7 Visitor Training

All visitors to the site will be given a health and safety briefing prior to gaining access to the site. Following this briefing, visitors will be asked to sign SSHP - Plan Acceptance Forms. The UXOSO will also ensure that visitors have applicable health and safety equipment, medical surveillance, and training for the activities/areas they will be visiting. Should questions arise as to whether or not specific training or equipment is needed - the PHSM will be contacted.

J-7.8 Ergonomic Training

An Industrial Training Program will be implemented and documented in accordance with OSHA and California Code of Regulations.

J-8.0 PERSONAL PROTECTION EQUIPMENT

Personal protective equipment required at the site will be at a level necessary to protect personnel. No contamination is anticipated; therefore, a level D ensemble will be worn.

J-8.1 Level D Protection Ensemble

The minimum level of protection for all personnel at this site is level D. A level D ensemble consists of:

- Short- or long-sleeve coveralls or work clothing
- Kevlar chaps (when operating chainsaw)
- Leather work boots (steel toe if a foot hazard exists [brush clearing and excavation])
- Safety glasses or goggles when an eye hazard exists (brush clearing and hand or mechanical excavation operations)
- Hard hat, when a head hazard exists (brush clearing and around heavy equipment)
- Work gloves, leather or rubber as appropriate
- Hearing protection when working around heavy equipment or powered hand tools
- Respirator when clearing/grubbing rodent nests (APR with N-100 cartridge)
- Sun block and insect repellant as needed
- Demolition operations PPE
- Reflective safety vest usage

J-8.2 Upgrading PPE

The level of protection is based on what is known about the site. Protection levels may change as site conditions change. The UXOSO monitors site conditions and provides information to the PHSM and RPM as necessary. The UXOSO may increase the levels of protection when necessary but cannot downgrade them without approval from PHSM. PPE requirements specific to lead hazards are provided by the Lead Management Plan.

J-9.0 SITE CONTROL

The UXOSO will coordinate access control and security on site. Due to the hazardous nature of MEC, only authorized personnel will be allowed in the exclusion zone (EZ). The EZ is the work site, encompassing an area large enough to prevent personnel injuries as a result of MEC operations. The boundary of the EZ will be appropriately identified. During intrusive operations the boundary will be established by the UXOSO based on minimum separation distance. The MSD is the minimum separation distance for unrelated personnel given unintentional detonation of conventional ordnance items. The MSD for all unrelated personnel for an unintentional detonation will be determined by the greatest distance 200 feet, the K50 distance, or the maximum fragment throw distance. During intrusive operations only essential trained personnel are allowed in the EZ.

Visitors must check-in at the field office to gain access to work sites. The UXOSO or a designee will escort visitors to and from work sites. During all operations on site the field supervisors can cease operations if unescorted personnel are observed within the operating area. During work hours ESCA RP Team personnel provide security at the site. Equipment is secured at the end of the workday.

Representatives from regulatory agencies are permitted to enter the site at any time during business hours or any other reasonable time with an escort. Regulatory agencies will be allowed to perform their oversight functions during MEC operations, and are considered essential personnel. Site controls to ensure their safety are included in Section 6.4, Activity 5: MEC Operations.

In the case of an emergency, personnel will exit the site and move to the designated safe area. The safe area will be located upwind of the site. The UXOSO will determine the severity of the emergency. If the emergency warrants site evacuation the UXOSO or SUXOS will notify the Presidio of Monterey (POM) Fire Department and the proper authorities. After property transfer, the UXOSO or SUXOS will notify the Seaside Fire Department, Salinas Rural Fire Department, or the Monterey County Sheriff who will assume emergency response responsibility.

J-10.0 DECONTAMINATION AND PERSONNEL HYGIENE

In general, no hazardous, toxic, or radiological waste materials are anticipated; thus decontamination for constituents will not be required. Site sanitation will be established and maintained in compliance with 29 CFR 1926.51 and EM 385-1-1, Section 2.

J-10.1 Potable Water

An adequate supply of drinkable water will be provided on site during work activities.

J-10.2 Toilet Facilities

As the former Fort Ord work sites are not provided with a sanitary sewer system, temporary toilet facilities will be used (Table J-5). Each temporary toilet will be naturally lighted, ventilated, and lockable from the inside.

Table J-5
Minimum Number of Facilities

Number of Employees	Number of Facilities
20 or fewer employees	One toilet with seat
More than 20, less than 200 employees	One toilet with seat and one urinal per forty employees
More than 200 employees	One toilet with seat and one urinal per fifty employees

J-10.3 Washing Facilities

Washing facilities in the EZ will consist of water containers, buckets, soap, and drying towels. Workers exiting the EZ must wash hands and face prior to eating, drinking, or smoking.

J-11.0 ENVIRONMENTAL AND PERSONAL MONITORING

Exposure to hazardous airborne substances is anticipated only in areas where lead hazards may exist (i.e., small arms ranges, or during structure demolition). Exposure assessment monitoring requirements are provided by the Lead Management Plan.

J-12.0 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

The frequency and severity of emergency situations can be dramatically reduced through proper implementation of the SSHP. However, if an emergency does occur, quick, decisive action will be required since delays in minutes can create or escalate life-threatening situations. In an emergency situation, site personnel involved in emergency response and rescue must be prepared to respond immediately and all required equipment must be on hand, in proper working order, and ready to use. To ensure rapid, effective response to a site emergency, the procedures and contingency plans outlined in this section will be implemented prior to and during the conduct of any site activities involving exposure to safety and health hazards.

J-12.1 Identifying Potential Emergencies

Contingency plans for responding to the potential emergency situations have been developed and are presented below. Potential emergencies that may occur include:

- Injury or illness
- Fire/explosion
- Inclement weather

J-12.2 Emergency Response Responsibilities

In the event of an emergency, the UXOSO will assume the responsibility of being the On Scene Incident Commander (OSIC). The alternate person to assume this role, in the event that the UXOSO is unavailable or incapacitated, will be the SUXOS. The OSIC will have the responsibility of directing all on-site and off-site response personnel. Upon arrival of First Responders (i.e., fire department) and upon determination that no ordnance or explosives hazard exists, the role of OSIC will be turned over to the senior responding member of the fire department.

J-12.3 On-Site Emergency Response Services

WESTON personnel will provide first aid treatment for minor injuries up to the limits of their qualifications and training. At least one person per team will be First Aid and CPR certified. If necessary the OSIC will contact medical personnel to determine if additional treatment is required. If further treatment is required the fire department providing fire services to Fort Ord will be notified and the injured person will be transported to the Community Hospital of the Monterey Peninsula (CHOMP). If transport by the WestMed ambulance is required, an escort will meet the ambulance at the corner of General Jim Moore Boulevard and Eucalyptus Road and guide them to the accident site.

J-12.4 Off-Site Emergency Response Services

Off-site emergency response services may include local fire and law enforcement personnel. Emergency phone numbers for off-site response organizations are presented in Table J-6.

Table J-6
Emergency Contacts

Emergency Contact	Telephone Number
MEDEVAC, Cal Star	(800) 252-5050
Community Hospital of the Monterey Peninsula	(831) 624-5311
Santa Clara Valley Medical Center	(408) 885-5000
WestMed	(831) 655-4040

POM Fire Department	(831) 242-7851 / 7852
POM Police	(831) 242-7853
Seaside Fire Department	(831) 899-6790
Seaside Police	(831) 899-6753
Salinas Rural Fire District	(831) 455-1828
Monterey County Sheriff	(831) 755-3801
WESTON PHSM – Mike Stuart	(505) 837-6566
WESTON Remediation Project Manager-Linda Temple	(831) 384-3221
Poison Control	(800) 222-1222

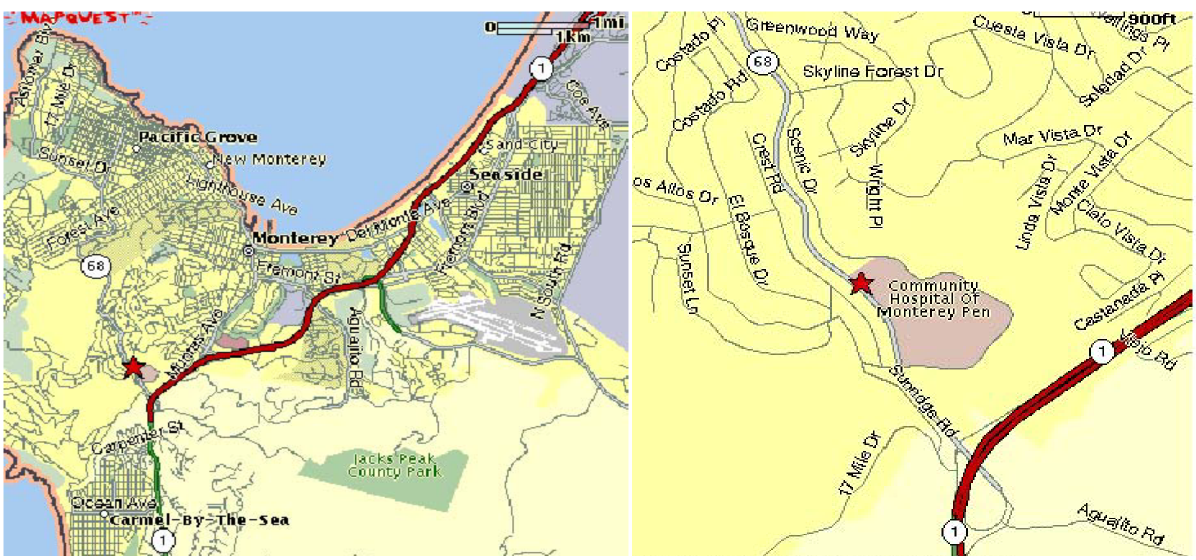
J-12.5 Route to Hospital

The evacuation route map to the CHOMP from Fort Ord is presented below (Figure J-4). The map will be kept in all vehicles. Directions for evacuation are printed with the map below.

Directions to: Community Hospital of Monterey Peninsula
23625 Holman Highway, Monterey, California 93940
(831) 624-5311

1. Access CA- 1 from Seaside or Sand City.
2. CA-1 S becomes CA-1 S/CA-68 W. Take the 68 West exit toward Asilomar.
3. The hospital will be on the right.

Figure J-4
Route to Hospital



J-12.6 Emergency Response Training

All site personnel will receive specialized training that will be given by the UXOSO prior to initiating site activities involving safety and health hazards. The content of this training will include the items listed below and will be documented using the site Training Log.

- Emergency chain-of-command
- Communication methods and signals
- Emergency equipment and PPE
- Removing injured personnel from the site
- Emergency contacts, phone numbers and hospital route

J-12.7 Emergency Equipment

During intrusive operations, the UXOSO will maintain emergency equipment containing the following: an eyewash station, first-aid kit, a fire extinguisher, a portable cellular telephone and radio. Copies of pertinent figures including emergency phone numbers and maps to emergency facilities will be included with this equipment.

For non-intrusive operations, such as geophysical surveying, a first-aid kit, fire extinguisher, and radio will be provided.

J-12.7.1 Fire Extinguishers

Portable fire extinguishers approved by a nationally recognized testing laboratory, and labeled to identify the labeling organization and the fire test and performance standard, will be provided at each individual job site. Extinguishers will be fully charged and in operable condition.

A dry-chemical type 4A:20B:C extinguisher will be available at each work site. Each piece of heavy equipment, site trailer, and each vehicle will be equipped with at least a 2A:10B:C fire extinguisher.

J-12.7.2 First-Aid Equipment

First aid kits will be the 16 unit first aid kits and comply with American National Standards Institute Z308.1. A kit will be located in each field team vehicle and at the field office. Kits will be inspected on a weekly basis and missing components replaced immediately.

J-12.8 Communication Devices

Site communication devices will include portable, hand-held two-way radios for communication between teams and the field office. Cellular telephones will be used to communicate with off-site individuals and organizations. Radios will be distributed to the SUXOS the UXOSO and to each field team supervisor.

J-12.9 General Emergency Procedures

Emergency response procedures include all steps to be taken for notifying, evaluating, reacting to, documenting, and following up on a given emergency situation. To ensure all necessary elements are covered, the procedural steps outlined in this paragraph will be implemented for each emergency, regardless of its nature.

J-12.9.1 Notification

Once the OSIC has been informed of an emergency, the OSIC will alert site personnel to the presence of the emergency by radio. This will be done to:

- Notify personnel and to get their attention
- Stop all work activity as required
- Lower noise levels in order to speed and simplify communication
- Initiate emergency or evacuation procedures

If on-site ESCA RP Team personnel or off-site emergency personnel are to enter the site in response to the emergency, the OSIC will to the extent possible, notify the response personnel about the nature of the emergency, to include:

- What happened and when it happened
- Where on site the emergency situation occurred
- Who is involved and, if possible, the cause of the emergency
- The extent of damage and what hazards may be involved
- What actions should be taken

J-12.9.2 Assessing the Emergency

Available information related to the emergency and the on-site response capabilities should be evaluated and the information listed below obtained to the extent possible:

- What happened:
- Type of incident
- Casualties involved:
- Victims (number, location and condition)
- Treatment required
- Missing personnel

- Cause of incident
- Extent of damage to structures, equipment and terrain
- What could happen from this point:
- Potential for fire or explosion
- Location of all personnel in relation to hazardous areas
- Potential for emergency affecting the general public or the environment
- What can be done to remedy the situation:
- Equipment and personnel needed for rescue and hazard mitigation
- Number of uninjured personnel available for response
- Resources available on site
- Resources available from off-site response groups and agencies
- Time needed for off-site response resources to reach the site
- Hazards involved in rescue and response

J-12.9.3 Rescue and Response Actions

Based on the information collected during the emergency assessment, the general actions listed below will be taken, with some actions being conducted concurrently. No one will attempt emergency response/rescue until the situation has been assessed and the appropriate response outlined by the OSIC.

- Enforce the Buddy System:
- Allow no one to enter a hazardous area without a partner
- Personnel in the EZ should be in line-of-sight or in communication with the OSIC or his designee
- Survey Casualties:
- Locate all victims and assess their condition
- Determine resources needed for stabilization and transport
- Assess Existing and Potential Hazards and Determine:
- Whether and how to respond
- The need for evacuation of site personnel and off-site population
- The resources needed for evacuation and response
- Contact the required off-site/on-site personnel or facilities, such as ambulance, fire department, police, etc.
- Allocate on-site personnel and equipment to rescue and initiate incident response operations

- Assist in bringing the hazardous situation under complete or temporary control and use measures to prevent the spread of the emergency, i.e., control fire, secure site, etc.
- Remove or assist victims from the area
- Stabilize:
- Administer any medical procedures that are necessary before the victims can be moved
- Stabilize or permanently fix the hazardous condition
- Attend to what caused the emergency and anything damaged or endangered by the emergency (e.g., drums, tanks)
- Transport using either on-site or off-site assets
- Casualty Logging-Record who, time, destination and condition upon transport
- Evacuate:
- Move site personnel to the rally point, a safe distance upwind of the incident
- Monitor the incident for significant changes; the hazards may diminish, permitting personnel to re-enter the site, or hazards may increase and require public evacuation
- Casualty Tracking-Record disposition, condition and location

J-12.9.4 Post Emergency Follow Up

Before normal site activities can resume, the site and personnel must be prepared and equipped to handle another emergency. It is also imperative that all federal, state, and local regulatory agencies be notified of the emergency. Therefore, the following activities must be conducted prior to resumption of site activities:

- Notify all appropriate governmental agencies as required (i.e., OSHA must be notified if there have been any fatalities or three or more personnel hospitalized)
- Restock and clean all equipment and supplies utilized or damaged in the emergency
- UXOSO should conduct an accident investigation to determine the cause of the emergency and what preventative measures could be taken to ensure the emergency does not occur again
- Review and revise, as needed the SSHP to reflect the new procedures

J-12.10 Contingency Plans

The following paragraphs contain emergency specific contingency plans. These plans outline the procedures for mitigating potential emergency situations. Any changes to these plans must be approved by the PHSM.

J-12.10.1 Injury or Illness

In the event of an emergency involving personal injury or illness, immediate response will be key in preventing further harm and providing comfort to the affected party. When personnel are injured or overcome by illness, the following procedure will be followed:

- Upon notification of the occurrence and nature of the injury/illness the OSIC will, if deemed necessary, summon emergency personnel
- The OSIC or SUXOS will assess the severity of the injury/illness and direct personnel to provide CPR/First aid as needed
- If immediate life support is not required, or once the victim is stabilized, and if required, transport victim to the appropriate medical facility for further attention

J-12.10.2 Fire and Explosion

Small Fire

A small fire is defined as a fire that can be extinguished with a 4A:20B:C type fire extinguisher. In the event of a small fire, site personnel will take the following actions:

- All unnecessary personnel will be evacuated from the immediate area, to an upwind location
- Extinguish the fire using portable fire extinguishers or by smothering from an upwind location
- Request emergency response assistance (ambulance, fire, police) as needed
- Do not attempt to extinguish a fire, even a small one, involving explosives
- Notify the UXOSO, SUXOS and the RPM

Large Fires

In the event of a large fire (or small fire which cannot be extinguished), the following actions will be taken:

- All unnecessary personnel will be evacuated from the site, to an upwind location
- The Local Fire Department, and/or other emergency response services (police, ambulance, hospital, etc.) will be notified as needed by the OSIC
- OSIC will meet Fire Department and direct them to location of fire
- After the Fire Department has arrived, OSIC will notify the Project Manager and RPM

Explosion

In the event of an explosion, all nonessential personnel will evacuate and help secure the site; the OSIC will request the required support equipment and personnel. It is essential that the site be evacuated and no one is allowed to re-enter, except to possibly save a life, until at least 30 minutes or longer if necessary, after the explosion. The OSIC will determine what actions are appropriate.

J-12.10.3 Chemical Spills

A spill kit will be maintained at the site in case a chemical being used at the site (such as oil or gasoline) is spilled. The kit will include spill absorbers (spill socks, pads, and pillows), and disposable bags. Approximately 18 gallons of spilled oil, coolants, fuels, or water can be absorbed using the contents of the kit.

All spills will be immediately reported to UXOSO per procedures outlined in the Environmental Protection Plan.

J-13.0 LOGS, REPORTS, AND RECORD KEEPING

J-13.1 Logbook

The SUXOS will keep a log recording the following aspects related to safety at the site:

- Training (initial site specific training, tailgate meetings, etc)
- Site visitors
- Safety issues or problems encountered
- Accidents
- Emergencies

J-13.2 Safety Logs

The UXOSO will maintain a daily safety log of all safety related activities. The following information will be maintained in the safety log:

- Date and recorder of log
- Tailgate safety briefing (time conducted, material discussed, etc.)
- Weather conditions
- Significant site events relating to safety
- Accidents

- Stop-work events related to safety
- Safety inspections

J-13.3 Training Logs

The UXOSO will maintain a training log documenting the following information:

- Date of training
- Type of training (initial, tailgate briefing, visitor)
- Workers or visitors attending training
- Signature of UXOSO

J-13.4 Equipment Maintenance

The SUXOS will document the results of daily check of heavy equipment using the Heavy Equipment Daily Inspection List.

J-13.5 Record Keeping

The UXOSO will establish and maintain a filing system on site for health and safety records, reports, and information concerning individual training, medical surveillance, etc. Sections in this filing system will include:

- Training Records - Certificates for training required by 29 CFR1910.120 (40-hour initial HAZWOPER, 8 hour refresher, and supervisory training) will be maintained at the site. Additionally, documentation of CPR and First Aid training will be available at the site
- Medical Monitoring - Documentation of current enrollment (within last 12 months) in a medical monitoring program will be available for each employee working at the site. Documentation will consist of the employee's Health Status Report that is written and signed by the examining physician
- Accident Reports - Copies of any accident/incident reports and follow-up reports
- Plan Acceptance Forms - Copies of the Plan Acceptance Forms documenting that employees have read and understand the SSHP will be maintained at the site

J-13.6 Accident Reporting

If an injury occurs on site, the UXOSO is responsible for completing a WESTON accident report form. The UXOSO must submit a copy of this form to PHSM within 24 hours of the injury. All accidents/incidents must be investigated by the UXOSO. The purpose of the investigation is to determine the causal factors that lead to the accident/incident and to establish corrective actions to prevent recurrence.

J-14.0 STANDARD OPERATING PROCEDURES, ENGINEERING CONTROLS, AND SAFE WORK PRACTICES

J-14.1 General Safety

- The following are standard practices for work on Fort Ord sites
- Eating, drinking, chewing tobacco, smoking, and carrying matches or lighters are prohibited in a contaminated or potentially contaminated area or where the possibility of contamination transfer exists
- Field crewmembers should be alert to all potentially dangerous situations, i.e., presence of strong, irritating, unusual, or nauseating odors
- Field crewmembers will be familiar with the physical characteristics of a site during intrusive investigations, including:
- Wind direction in relation to nearby buildings
- Accessibility to associates, equipment, vehicles, communication
- Hot zone (areas of known or suspected contamination)
- Site access
- Nearest water sources
- Protective equipment as specified in this SSHP will be used by workers throughout the Fort Ord project
- Use of heavy equipment on site, i.e., trucks, and bobcats, presents additional hazards for site workers. For example, the vision of a backhoe operator is limited, so all field crewmembers should stay clear when backhoe is operating
- Wearing personal protective equipment can result in an impairment of the ability to operate site equipment. All field crewmembers should pay specific attention to decreased performance capabilities resulting from the use of personal protective equipment, such as poor tactile skills when wearing certain types of gloves. Prior knowledge of limitations imposed by the use of such equipment and clothing will allow the worker to assess the decrease in his or her capability to perform field operations in a safe manner
- Wearing of jewelry, such as loose bracelets and necklaces is prohibited in order to avoid its entanglement in site machinery

J-15.0 PROCEDURES AND PROGRAMS

J-15.1 Hearing Conservation Program

The purpose of this Hearing Conservation Program is to provide protection for employees from adverse health effects associated with occupational exposure to noise. The program consists of annual audiometric testing of workers, annual employee training, selection, and use of hearing protection, and noise monitoring. All employees and subcontractors must comply with this program.

Audiometric Testing Program

Audiometric testing will be made available to all employees whose exposures equal or exceed an 8-hour time-weighted average of 85 decibels. Audiometric tests will be performed by a licensed or certified audiologist, otolaryngologist, or physician who is certified by the Council of Accreditation in Occupational Hearing Conservation. Each employee assigned to noisy operations must receive a baseline audiogram prior to assignment and yearly testing thereafter for as long as that employee is exposed to excessive noise levels (8-hour time-weighted average of 85 decibels or greater). Each employee's annual audiogram is compared to that employee's baseline audiogram to determine if the audiogram is valid and if a standard threshold shift has occurred. (A standard threshold shift is a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2000, 3000, and 4000 Hz in either ear.) This comparison should be done by a physician.

If a comparison of the annual audiogram to the baseline audiogram indicates a standard threshold shift has occurred, the employee will be informed of this fact in writing, within 21 days of the determination. The following steps are taken by the UXOSO when a standard threshold shift occurs:

- Employees not using hearing protectors will be fitted with hearing protectors, trained in their use and care, and required to use them
- Employees already using hearing protectors will be refitted and retrained in the use of hearing protectors and provided with hearing protectors offering greater attenuation if necessary
- The employee will be referred for a clinical audiological evaluation or an otological examination, as appropriate, if additional testing is necessary
- The employee is informed of the need for an otological examination if a medical pathology of the ear that is unrelated to the use of hearing protectors is suspected

Audiometric tests will be pure tone, air conduction, hearing threshold examinations, with test frequencies including as a minimum 500, 1000, 2000, 3000, 4000, and 6000 Hz. tests at each frequency will be taken separately for each ear. Audiometric tests will be conducted with audiometers (including microprocessor audiometers) that meet the specifications of, and are maintained and used in accordance with, American National Standard Specification for Audiometers, S3.6-1969. The functional operation of the audiometer will be checked before each day's use by testing a person with known, stable hearing thresholds, and by listening to the audiometer's output to make sure that the output is free from distorted or unwanted sounds. Audiometer calibration will be checked acoustically at least annually in accordance with OSHA requirement (29 CFR 1910.95, Appendix E).

Hearing Protectors

The UXOSO will make hearing protectors available to all ESCA RP Team and subcontract employees exposed to an 8-hour time-weighted average of 85 decibels or greater. Hearing protection for this project will consist of earmuffs or foam fitting earplugs. The selection of hearing protector will be based upon noise attenuation requirements for the task and worker comfort.

Employee Training

The UXOSO will develop a hearing conservation training program for all employees assigned to noisy work. This training will be a component of the initial site safety training. As a minimum the training will consist of:

- The effects of noise on hearing
- The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and instructions on selection, fitting, use, and care
- The purpose of audiometric testing, and an explanation of the test procedures

Noise Monitoring

When operations are anticipated to exceed the 8-hour time-weighted average of 85 decibels, the UXOSO will implement a noise monitoring program. The sampling will be used to:

- Verify that appropriate hearing protection is being used by employees
- Identify the boundaries of the noise hazard area in accordance with Section 05.C.07 of EM 385-1-1
- Instruments used to measure employee noise exposure will be calibrated to ensure accuracy

J-15.2 Hazard Communication Program

Introduction

The OSHA Hazard Communications Standard (29 CFR 1910.1200) was promulgated to ensure that all chemicals would be evaluated and information regarding the associated chemical hazards would be communicated appropriately. The goal of the standard is to reduce the number of chemically related occupational illnesses and injuries.

In order to comply with the OSHA Hazard Communication Standard, this written program has been established for work at Fort Ord. All ESCA RP Team and subcontractor personnel working at Fort Ord are included in this program.

Hazardous Chemical Inventory List

Hazardous chemicals used at Fort Ord include industrial chemicals such as fuels, oils, and greases. The UXOSO will maintain an inventory of hazardous chemicals brought onto Fort Ord.

Material Safety Data Sheets (MSDSs)

MSDSs are prepared by manufacturers or producers to provide specific information on the safety precautions and health effects of a particular chemical or mixture. The material safety data sheet (MSDS) contains at a minimum the following information:

- Chemical and common names
- Physical and chemical characteristics
- Physical hazards
- Health hazards
- Primary routes of entry
- Exposure limits
- Carcinogenic potential
- Handling and protective precautions
- Control measures
- Emergency and first aid procedures
- Date of MSDS preparation
- Name and address of manufacturer

When chemicals are ordered, the SUXOS or his designee will specify on the purchase order that chemicals are not to be shipped without corresponding MSDSs. When chemicals and MSDSs arrive, they will be reviewed for completeness by the UXOSO or his designee. Should any MSDS be incomplete, a letter or FAX will be sent immediately to the manufacturer requesting the additional information, ESCA RP Team or its subcontractors will not accept (at Fort Ord sites) any shipped chemical materials without an MSDS.

A complete file of MSDSs for all hazardous chemicals to which an employee of the ESCA RP Team may be exposed will be kept in labeled files on site. MSDSs for chemicals anticipated to be used at the site are provided at the end of this attachment. In the event that an MSDS is missing the employee should immediately contact the UXOSO or PHSM.

MSDSs at this site will be reviewed during periodic audits by the PHSM. Should there be any MSDS that has not been updated within the past year a new MSDS will be requested.

Labels and Other Forms of Warning

The Hazard Communication Standard requires that hazardous chemicals be labeled by manufacturers. The label must contain the following:

- Chemical identity
- Appropriate warnings
- Name and address of manufacturer, importer, or other responsible party. If the labels are incomplete or missing, ESCA RP Team personnel will refuse the shipment.

When chemicals are transferred from the manufacturer's containers to secondary containers, the Site Manager or UXOSO will ensure that the containers are labeled with the identity of the chemicals and appropriate hazard warnings. Labels for secondary containers can be obtained from the UXOSO.

The entire labeling procedure will be reviewed at least annually and changed as necessary.

Employee Information and Training

Prior to starting work the ESCA RP Team and its subcontractors' employees will attend a site specific safety and health training course. This course will include Hazard Communication Training to review the contents of this program and learn the hazards associated with each listed hazardous chemical. The training will be performed by the UXOSO. The format will be classroom training.

Training Topics

The site training or HAZCOM will include:

- An overview of the requirements of the Hazard Communication Standard
- The labeling system and how to use it
- How to review MSDSs and where they are kept
- Chemicals present in work operations
- Physical and health effects of hazardous chemicals
- Methods and observation techniques used to determine the presence or release of hazardous chemicals in the area
- PPE and work practices to reduce or prevent exposure to chemicals
- Steps to be taken to prevent or reduce exposure to chemicals
- Safety-emergency procedures to follow if exposure occurs
- Location and availability of written program/MSDSs
- Equipment Training (Table J-8)

Following the training session(s), each employee will sign and date the training record. Additional training may be provided by the UXOSO, with the introduction of each new hazardous chemical. Records of additional training will be maintained.

On-Site Contractors and Visitors

WESTON understands that at times other persons may be on the work site. New contractors, subcontractors and visitors will be required to attend site health and safety training to familiarize them with the contents of this document and the specific hazards associated with the former Fort Ord. New contractors, subcontractors, and visitors will be provided with the following information:

- Hazardous chemicals to which the contractor's employees or visitors may be exposed
- Precautions necessary to protect employees during normal operating conditions and foreseeable emergencies
- Labeling system used in the work place

It is the responsibility of the Site Manager and/or UXOSO to ensure that all MSDSs of chemicals to which the contractor's employees or visitors may be exposed are made available at a central location in the work place along with an example of the labeling system in use. Visitors and subcontractors will be informed of the availability of this information and its location.

Program Review

This written hazard communications program for the ESCA RP Team will be reviewed by the PHSM at least annually and updated as necessary.

J-16.0 REFERENCES

National Institute for Occupational Safety and Health, Occupational Safety and Health Administration, U.S. Coast Guard, and U.S. Environmental Protection Agency (EPA) (NIOSH/OSHA/USCG/EPA). 1985. Occupation Safety and Health Guidance Manual for Hazardous Waste Site Activities. October.

Vetter, Rick. 1999. Identifying and Misidentifying the Brown Recluse Spider, Dermatology Online Journal 5(2):7, http://dermatology.cdlib.org/DOJvol5num2/special/recluse.html (accessed 12/3/07).

Table J-7
Hazard Analysis by Site Activity, Activity 1 - Preliminary Activities

Activity	Hazards	Hazard Control
Mobilization of personnel, equipment, and supplies to the project site, setup of office and storage areas	***Chemical Hazards*** - Non-intrusive activities; therefore, the risk level of exposure to site contaminants during this activity is low. Focus on hazard awareness and change of conditions.	No intrusive measures allowed during this activity. Wear appropriate PPE for skin protection and to prevent dermal contact. Avoid liquid pools and stained areas if possible. An initial visual survey will be conducted to confirm the levels of protection are correct for the activity.
	Physical Hazards - Slips, trips, falls, tools, terrain, or vegetation; uneven walking surfaces; weather hazards, such as snow and ice; and poor visibility.	The work area will be visually inspected. Housekeeping - Slip, trip, and fall hazards will be either removed or marked and barricaded. Materials will be stored to prevent intrusion into the work areas. Work areas will be kept organized; and ice, snow, and mud will be cleared from steps to reduce slip hazards. Work to be completed in adequate natural light or assure sufficient illumination is maintained. Site personnel will conduct an initial walkover, and the "buddy system" will be implemented. Fall protection (railing or Fall Arrest Systems) will be installed if work is to be conducted at a level higher than 6 feet. See field operating procedure (FLD) 02, FLD 11, FLD 12, and FLD 39.
	Manual lifting	Use proper lifting techniques such as keeping straight back, lifting with legs; avoid twisting back; use mechanical equipment or get help from others whenever possible. Heavy loads will be split into smaller loads and/or assistance sought. The path of travel should be cleared prior to the lift. See FLD 10.
	Fire	Flammable liquids will be stored in safety containers and flammable storage cabinets. Propane cylinders will be stored outside in secured areas. Fuel storage tanks will be placed in impermeable dikes. Properly rated fire extinguishers will be placed within 50 feet of the fuel storage area, in construction equipment, and strategically in the construction area. See FLD 31 and 32.
	Hands or fingers caught between objects; abrasions and lacerations.	Personnel will be made aware of the hazard and asked to coordinate carefully the handling and placement of heavy objects. Materials and objects being handled will be inspected for rough or sharp edges, and appropriate precautions will be taken to avoid contact. Personnel will wear work gloves and avoid placing hands between objects.

Table J-7
Hazard Analysis by Site Activity, Activity 1 - Preliminary Activities

Activity	Hazards	Hazard Control
Mobilization of personnel, equipment, and supplies to the project site, setup of office and storage areas (continued)	Electric hazards	Generators will be grounded unless self-grounded. Extension cords will be properly rated for intended use. Prior to any intrusive activity, authorities will be contacted for permits. Elevated parts of machinery, ladders, and antennas will be kept at least 10 feet from overhead electric lines. Electrical installations will be made by qualified electricians. A lockout/tagout program consistent with FLD 42 will be used for equipment maintenance. Also refer to FLDs 34, 35, and 38.
	Moving/heavy equipment operations.	Only trained, experienced operators will operate equipment. Equipment will be inspected daily. Personnel will be made aware of the hazard and will coordinate carefully during handling equipment operations. Personnel restricted in area of operation. Back up alarms functional. Stay out of the swing area of all equipment and from under loads. No personnel will ride on the equipment unless seats are provided. Guards will be kept in place during operation. Maintain safe distance from moving mechanical parts. Always use appropriate PPE. See FLDs 20, 22, 23, and 24.
	Hand tools, manual and power.	Tools will be inspected prior to use. Damaged tools will be tagged out of service until repair can be performed by a qualified person. Use tools properly and for their intended purpose. All power circuits used for hand tools will be protected by a ground fault circuit interrupter. All personnel will be trained on the proper use of all power tools. Lockout/ tagout procedures will be implemented per FLD 42 and 29 Occupational Safety and Health Administration (OSHA) 1910. Also see FLD 38.
	Caught in/between/struck by or against an object.	Workers will stay out of the swing area of all equipment and will not walk, work or stand near equipment being loaded or unloaded. No personnel will ride on the equipment unless seats are provided. See FLDs 20, 23, and 24. Ground personnel near operating heavy equipment will wear hard hats and traffic vests. The handling and placement of heavy equipment will be carefully coordinated. Materials and objects will be inspected for rough or sharp edges, and appropriate precautions will be taken to avoid contact. Personnel will wear work gloves and avoid placing hands between objects. Backup alarms will be in operable condition. Unnecessary backing will be avoided. Safety toe footwear will be required. Tools will be properly used.

Table J-7
Hazard Analysis by Site Activity, Activity 1 - Preliminary Activities

Activity	Hazards	Hazard Control
Mobilization of personnel, equipment, and supplies to the project site, setup of office and storage areas (continued)	Inclement weather, heat/cold stress	Workers will be briefed and cognizant of heat and cold stress symptoms. Electrolyte/fluids replacement will be available to workers. Work rest periods will be established according to American Conference of Governmental Industrial Hygienists (ACGIH), National Institute for Occupational Safety and Health (NIOSH) guidelines, and FLDs 05 and 06. Personnel will be monitored. Salt will be applied to walkway and roadway surfaces where ice is a problem. As determined by the UXOSO, operations are to cease during severe weather conditions, see FLD 02 – Inclement Weather.
	Traffic	Work areas will be clearly barricaded using existing gates and appropriate signs displayed. Traffic will be rerouted as necessary. Persons working in traffic area, near roadways or directing traffic will wear high visibility (reflective) vests. Posted speed limit of 15 miles per hour. See FLD 20.
	Biological **-** Possibility of stinging and biting insects, poisonous snakes; possibility of exposure to poison ivy, sumac.	Use appropriate insect repellants. Training to avoid poisonous plants and avoid contact. Adhere to WESTON Bloodborne Pathogens Exposure Control Plan— First Aid Procedures FLD 43.
	Radiation **-** Potential sun burn/sun poisoning hazard on bright, sunny days.	Use sunblock as appropriate. Avoid direct exposure to sun for long periods of time. There is no known source of radioactive material at this site.

Table J-7
Hazard Analysis by Site Activity, Activity 2 - Site Preparation Activities

Activity	Hazards	Hazard Control
Site surveying to delineate work areas	***Chemical Hazards*** - The potential for exposure to petroleum and diesel products exist for this task.	Vehicles will not be over-filled, and caution will be used whenever refueling. Refueling will not be conducted within 100 feet of an open flame.
	Physical Hazards - Slip, trips, falls; tools, terrain or vegetation, uneven walking surfaces; weather hazards; poor visibility.	The work area will be visually inspected. Housekeeping - Slip, trip, and fall hazards will be either removed or marked and barricaded. Materials will be stored to prevent intrusion into the work areas. Work areas will be kept organized and ice, snow, and mud will be cleared from steps to reduce slip hazards. Work to be completed in adequate natural light or assure sufficient illumination is maintained. Site personnel will conduct an initial walkover, and the "buddy system" will be implemented. Fall protection (railing or Fall Arrest Systems) will be installed if work is to be conducted at a level higher than 6 feet. See FLD 02, FLD 11, FLD 12, FLD 39.
	Manual lifting	Use proper lifting techniques such as keeping straight back, lifting with legs; avoid twisting back; use mechanical equipment or get help from others whenever possible. Heavy loads will be split into smaller loads and/or assistance sought. The path of travel should be cleared prior to the lift. See FLD 10.
	Inclement weather, heat/cold stress	Personnel will be dressed according to weather conditions. Workers will be briefed and cognizant of heat and cold stress symptoms. Electrolyte/fluids replacement will be available to workers. Work rest periods will be established according to ACGIH, NIOSH guidelines, and FLDs 05 and 06. Personnel will be monitored. Salt will be applied to walkway and roadway surfaces where ice is a problem. As determined by the UXOSO, operations are to cease during severe weather conditions, see FLD 02 – Inclement Weather.

Table J-7
Hazard Analysis by Site Activity, Activity 2 - Site Preparation Activities

Activity	Hazards	Hazard Control
Site surveying to delineate work areas (continued)	Moving/heavy equipment operations	Only trained, experienced operators will operate equipment. Equipment will be inspected daily. Personnel will be made aware of the hazard and will coordinate carefully during handling equipment operations. Personnel restricted in area of operation. Back up alarms functional. Stay out of the swing area of all equipment and from under loads. No personnel will ride on the equipment unless seats are provided. Guards will be kept in place during operation. Maintain safe distance from moving mechanical parts. Always use appropriate PPE. See FLDs 20, 22, 23, and 24.
	Hands or fingers caught between objects; abrasions and lacerations.	Personnel will be made aware of potential hazards and will coordinate carefully the handling and placement of heavy objects. Materials and objects being handled will be inspected for ice and rough or sharp edges, and appropriate precautions will be taken to avoid contact. Personnel will wear work gloves and avoid placing hands between objects. See FLD 10.
	Noise exposure	High noise areas will be identified. Hearing protection will be provided as appropriate. The latest ACGIH threshold limit values (TLVs) will be used. Personnel operating chainsaws will use hearing protection. Hearing control program, which consists of audiometric examination; training; use of hearing protection; and sound level pressure monitoring when and where necessary. See FLD 01.
	Fire	Flammable liquids will be stored in safety containers and flammable storage cabinets. Propane cylinders will be stored outside in secured areas. Fuel storage tanks will be placed in impermeable dikes. Properly rated fire extinguishers will be placed within 50 feet of the fuel storage area, in construction equipment, and strategically in the construction area. See FLDs 31 and 32.
	Electric hazards	Generators will be grounded unless self-grounded. Extension cords will be properly rated for intended use. Prior to any intrusive activity, authorities will be contacted for permits. Elevated parts of machinery, ladders, and antennas will be kept at least 10 feet from overhead electric lines. Electrical installations will be made by qualified electricians. A lockout/tagout program consistent with FLD 42 will be used for equipment maintenance. Also refer to FLDs 34, 35 and 38.

Table J-7
Hazard Analysis by Site Activity, Activity 2 - Site Preparation Activities

Activity	Hazards	Hazard Control
Site surveying to delineate work areas (continued)	***Biological* -** Possibility of stinging and biting insects, poisonous snakes; possibility of exposure to poison ivy, sumac.	Use appropriate insect repellants. Training to avoid poisonous plants and avoid contact. Adhere to WESTON Bloodborne Pathogens Exposure Control Plan—First Aid Procedures FLD 43.
	***Radiation* -** There are no radiological hazards expected because past uses do not indicate the use of radioactive material. Potential sun burn/sun poisoning hazard on bright, sunny days.	Use sunblock as appropriate. Avoid direct exposure to sun for long periods of time. There is no known source of radioactive material at this site.

Table J-7
Hazard Analysis by Site Activity, Activity 3 - Excavation Activities

Activity	Hazards	Hazard Control
Excavation Activities	***Chemical Hazard*** - The potential for exposure to petroleum and diesel products exist for this task.	Vehicles will not be over-filled, and caution will be used whenever refueling. Refueling will not be conducted within 100 feet of an open flame.
	Physical Hazards - Slip, trips, falls; tools, terrain or vegetation, uneven walking surfaces; weather hazards; poor visibility.	The work area will be visually inspected. Housekeeping - Slip, trip, and fall hazards will be either removed or marked and barricaded. Materials will be stored to prevent intrusion into the work areas. Work areas will be kept organized and ice, snow, and mud will be cleared from steps to reduce slip hazards. Work to be completed in adequate natural light or assure sufficient illumination is maintained. Site personnel will conduct an initial walkover, and the “buddy system” will be implemented. Fall protection (railing or Fall Arrest Systems) will be installed if work is to be conducted at a level higher than 6 feet. See FLD 02, FLD 11, FLD 12, FLD 39.
	Manual lifting	Use proper lifting techniques such as keeping straight back, lifting with legs; avoid twisting back; use mechanical equipment or get help from others whenever possible. Heavy loads will be split into smaller loads and/or assistance sought. The path of travel should be cleared prior to the lift. See FLD 10.
	Inclement weather, heat/cold stress	Personnel will be dressed according to weather conditions. Workers will be briefed and cognizant of heat and cold stress symptoms. Electrolyte/fluids replacement will be available to workers. Work rest periods will be established according to ACGIH, NIOSH guidelines, and FLDs 05 and 06. Personnel will be monitored. Salt will be applied to walkway and roadway surfaces where ice is a problem. As determined by the UXOSO, operations are to cease during severe weather conditions, see FLD 02 – Inclement Weather.

Table J-7
Hazard Analysis by Site Activity, Activity 3 - Excavation Activities

Activity	Hazards	Hazard Control
Excavation Activities (continued)	Moving/heavy equipment operations	Only trained, experienced operators will operate equipment. Equipment will be inspected daily. Personnel will be made aware of the hazard and will coordinate carefully during handling equipment operations. Personnel restricted in area of operation. Back up alarms functional. Stay out of the swing area of all equipment and from under loads. No personnel will ride on the equipment unless seats are provided. Guards will be kept in place during operation. Maintain safe distance from moving mechanical parts. Always use appropriate PPE. See FLDs 20, 22, 23, and 24.
	Hands or fingers caught between objects; abrasions and lacerations.	Personnel will be made aware of potential hazards and will coordinate carefully the handling and placement of heavy objects. Materials and objects being handled will be inspected for ice and rough or sharp edges, and appropriate precautions will be taken to avoid contact. Personnel will wear work gloves and avoid placing hands between objects. See FLD 10.
	Noise exposure	High noise areas will be identified. Hearing protection will be provided as appropriate. The latest ACGIH TLVs will be used. Personnel operating chainsaws will use hearing protection. Hearing control program, which consists of audiometric examination; training; use of hearing protection; and sound level pressure monitoring when and where necessary. See FLD 01.
	Fire	Flammable liquids will be stored in safety containers and flammable storage cabinets. Propane cylinders will be stored outside in secured areas. Fuel storage tanks will be placed in impermeable dikes. Properly rated fire extinguishers will be placed within 50 feet of the fuel storage area, in construction equipment, and strategically in the construction area. See FLDs 31 and 32.
	Electric hazards	Generators will be grounded unless self-grounded. Extension cords will be properly rated for intended use. Prior to any intrusive activity, authorities will be contacted for permits. Elevated parts of machinery, ladders, and antennas will be kept at least 10 feet from overhead electric lines. Electrical installations will be made by qualified electricians. A lockout/tagout program consistent with FLD 42 will be used for equipment maintenance. Also refer to FLDs 34, 35 and 38.

Table J-7
Hazard Analysis by Site Activity, Activity 3 - Excavation Activities

Activity	Hazards	Hazard Control
Excavation Activities (continued)	***Biological* -** Possibility of stinging and biting insects, poisonous snakes; possibility of exposure to poison ivy, sumac.	Use appropriate insect repellants. Training to avoid poisonous plants and avoid contact. Adhere to WESTON Bloodborne Pathogens Exposure Control Plan—First Aid Procedures FLD 43.
	***Radiation* -** There are no radiological hazards expected because past uses do not indicate the use of radioactive material. Potential sun burn/sun poisoning hazard on bright, sunny days.	Use sunblock as appropriate. Avoid direct exposure to sun for long periods of time. There is no known source of radioactive material at this site.

Table J-7
Hazard Analysis by Site Activity, Activity 4 - Digital Geophysical Mapping Activities

Activity	Hazards	Hazard Control
DGM surveying to delineate areas with potential discarded military munitions (DMM). Surveying accomplished via towed array methods	***Chemical Hazards***—The potential for exposure to petroleum and diesel products exist for this task.	Vehicles will not be over-filled, and caution will be used whenever refueling. Refueling will not be conducted within 100 feet of an open flame.
	Physical Hazards—Slip, trips, falls; tools, terrain or vegetation, uneven walking surfaces; weather hazards; poor visibility.	The work area will be visually inspected. Housekeeping - Slip, trip, and fall hazards will be either removed or marked and barricaded. Materials will be stored to prevent intrusion into the work areas. Work areas will be kept organized and ice, snow, and mud will be cleared from steps to reduce slip hazards. Work to be completed in adequate natural light or assure sufficient illumination is maintained. Site personnel will conduct an initial walkover, and the "buddy system" will be implemented. Fall protection (railing or Fall Arrest Systems) will be installed if work is to be conducted at a level higher than 6 feet. See FLD 02, FLD 11, FLD 12, FLD 39.
	Manual lifting	Use proper lifting techniques such as keeping straight back, lifting with legs; avoid twisting back; use mechanical equipment or get help from others whenever possible. Heavy loads will be split into smaller loads and/or assistance sought. The path of travel should be cleared prior to the lift. See FLD 10.
	Inclement weather, heat/cold stress	Personnel will be dressed according to weather conditions. Workers will be briefed and cognizant of heat and cold stress symptoms. Electrolyte/fluids replacement will be available to workers. Work rest periods will be established according to ACGIH, and NIOSH guidelines, and FLDs 05 and 06. Personnel will be monitored. As determined by the UXOSO, operations are to cease during severe weather conditions. An adequate supply of drinking water will be provided in all places of work. Cool water will be provided during hot weather. Portable drinking water dispensers will be serviced to ensure sanitary conditions and be clearly marked "drinking water." Water will not be dipped from containers. See FLD 02 – Inclement Weather.

Table J-7
Hazard Analysis by Site Activity, Activity 4 - Digital Geophysical Mapping Activities

Activity	Hazards	Hazard Control
DGM surveying to delineate areas with potential DMM. Surveying accomplished via towed array methods (continued)	Moving/heavy equipment operations	Only trained, experienced operators will operate equipment. Equipment will be inspected daily. Personnel will be made aware of the hazard and will coordinate carefully during handling equipment operations. Personnel access will be restricted in area of operation. Back up alarms will be functional. Stay out of the swing area of all equipment and from under loads. No personnel will ride on the equipment unless seats are provided. Guards will be kept in place during operation. Maintain safe distance from moving mechanical parts. The ground spotter will wear an OSHA approved hard hat. Always use appropriate PPE. See FLDs 20, 22, 23, and 24.
	Hands or fingers caught between objects; abrasions and lacerations.	Personnel will be made aware of potential hazards and will coordinate carefully the handling and placement of heavy objects. Materials and objects being handled will be inspected for ice and rough or sharp edges, and appropriate precautions will be taken to avoid contact. Personnel will wear work gloves and avoid placing hands between objects. See FLD 10.
	Noise exposure	High noise areas will be identified. Hearing protection will be provided as appropriate. The latest ACGIH TLVs will be used. Personnel operating small gas engine equipment will use hearing protection. Hearing control program, which consists of audiometric examination; training; use of hearing protection; and sound level pressure monitoring when and where necessary. See FLD 01.
	Fire	Flammable liquids will be stored in safety containers and flammable storage cabinets. All storage, handling, and use of flammables and combustible liquids will be in accordance with NFPA 30, 30A and carried out under the supervision of a qualified person. Only labeled/listed containers and portable tanks will be used for the storage of flammables and/or combustibles. Propane cylinders will be stored outside in secured areas. Fuel storage tanks will be placed in impermeable dikes. Properly rated fire extinguishers will be placed within 50 feet of the fuel storage area, in construction equipment, and strategically in the construction area. See FLDs 31 and 32.

Table J-7
Hazard Analysis by Site Activity, Activity 4 - Digital Geophysical Mapping Activities

Activity	Hazards	Hazard Control
DGM surveying to delineate areas with potential DMM. Surveying accomplished via towed array methods (continued)	Electric hazards	Generators will be grounded unless self-grounded. Extension cords will be properly rated for intended use. Prior to any intrusive activity, authorities will be contacted for permits. Elevated parts of machinery, ladders, and antennas will be kept at least 10 feet from overhead electric lines. Electrical installations will be made by qualified electricians. A lockout/tagout program consistent with FLD 42 will be used for equipment maintenance. Also refer to FLDs 34, 35 and 38.
	Biological—Possibility of stinging and biting insects, poisonous snakes; possibility of exposure to poison ivy, sumac.	Use appropriate insect repellants. Training to avoid poisonous plants and avoid contact. Adhere to WESTON Bloodborne Pathogens Exposure Control Plan—First Aid Procedures FLD 43.
	Radiation—There are no radiological hazards expected because past uses do not indicate the use of radioactive material. Potential sun burn/sun poisoning hazard on bright, sunny days.	Use sunblock as appropriate. Avoid direct exposure to sun for long periods of time. There is no known source of radioactive material at this site.

Table J-7
Hazard Analysis by Site Activity, Activity 5 - MEC Operations

Activity	Hazards	Hazard Control
MEC safety escort activities, mag & flag operations to locate potential buried UXO, excavation and removal of potential MEC anomalies, and destruction/ disposal of UXO and scrap materials	Ordnance	All ordnance items will be positively identified prior to movement. Positively identify any fuzing associated with munition item. If found fuzed, do not handle. If unfuzed, may be moved to central location with approval of UXO Safety Officer. MEC operations will be conducted during daylight hours only. If an unknown ordnance item is found, the SUXOS will be notified. Do not approach a smoking white phosphorous munition; the burning white phosphorous may detonate the explosive burster at any time. Do not transport white phosphorous munitions unless they are immersed in water, mud, or wet sand.
	Demolition Operations-Unintentional Detonations.	All demolition activities will be performed in accordance with 60A-1-1-31.
	Chemical Hazards— White Phosphorous, Explosives.	Avoid movement of a white phosphorous munition. Avoid inhalation of and skin contact with smoke, fumes, and vapors of explosives and related hazardous materials.
	Physical Hazards—Slip, trips, falls, equipment, materials, tools, terrain, uneven walking surfaces; weather hazards; poor visibility.	The work area will be visually inspected. Housekeeping – Slip, trip, and fall hazards will be either removed or marked and barricaded. Geophysical teams will be dealing with uneven terrain. Slips, trips, and fall hazards will be the most prevalent. Sufficient illumination will be maintained to ensure a safe working environment and weather conditions to be continuously monitored. The “buddy system” will be implemented. See FLD 02, FLD 11, FLD 12, FLD 39.
	Manual lifting.	Use proper lifting techniques such as keeping straight back, lifting with legs; avoid twisting back; use mechanical equipment or get help from others whenever possible. Heavy loads will be split into smaller loads and/or assistance sought. The path of travel should be cleared prior to the lift. See FLD 10.
	Inclement weather, heat/cold stress.	Personnel will be dressed according to weather conditions. Workers will be briefed and cognizant of heat and cold stress symptoms. Electrolyte/fluids replacement will be available to workers. Work rest periods will be established according to ACGIH, NIOSH guidelines, and FLDs 05 and 06. Personnel will be monitored. Salt will be applied to walkway and roadway surfaces where ice is a problem. As determined by the UXOSO, operations are to cease during severe weather conditions, see FLD 02 – Inclement Weather.

Table J-7
Hazard Analysis by Site Activity, Activity 5 - MEC Operations

Activity	Hazards	Hazard Control
MEC safety escort activities, mag & flag operations to locate potential buried UXO, excavation and removal of potential MEC anomalies, and destruction/ disposal of UXO and scrap materials (continued)	Moving/heavy equipment operations	Only trained, experienced operators will operate equipment. Equipment will be inspected daily. Personnel will be made aware of the hazard and will coordinate carefully during handling equipment operations. Personnel restricted in area of operation. Back up alarms functional. Stay out of the swing area of all equipment and from under loads. No personnel will ride on the equipment unless seats are provided. Guards will be kept in place during operation. Maintain safe distance from moving mechanical parts. Always use appropriate PPE. See FLDs 20, 22, 23, and 24.
	Hands or fingers caught between objects; abrasions and lacerations.	Personnel will be made aware of the hazard and will coordinate carefully the handling and placement of heavy objects. Materials and objects being handled will be inspected for rough or sharp edges, and appropriate precautions will be taken to avoid contact. Personnel will wear work gloves and avoid placing hands between objects. See FLD 10.
	Noise exposure	High noise areas will be identified. Hearing protection will be provided as appropriate. The latest ACGIH TLVs will be used. Personnel operating chainsaws will use hearing protection. Hearing control program, which consists of audiometric examination; training; use of hearing protection; and sound level pressure monitoring when and where necessary. See FLD 01.
	Fire	Flammable liquids will be stored in safety containers and flammable storage cabinets. Propane cylinders will be stored outside in secured areas. Fuel storage tanks will be placed in impermeable dikes. Properly rated fire extinguishers will be placed within 50 feet of the fuel storage area, in construction equipment, and strategically in the construction area. All explosives to be stored in an approved Bureau of Alcohol, Tobacco, Firearms, and Explosives Type 2 Magazine. See FLDs 31 and 32.
	Electric hazards	Generators will be grounded unless self-grounded. Extension cords will be properly rated for intended use. Prior to any intrusive activity, authorities will be contacted for permits. Elevated parts of machinery, ladders, and antennas will be kept at least 10 feet from overhead electric lines. Electrical installations will be made by qualified electricians. A lockout/tagout program consistent with FLD 42 will be used for equipment maintenance. Also refer to FLDs 34, 35, and 38.

Table J-7
Hazard Analysis by Site Activity, Activity 5 - MEC Operations

Activity	Hazards	Hazard Control
MEC safety escort activities, mag & flag operations to locate potential buried UXO, excavation and removal of potential MEC anomalies, and destruction/ disposal of UXO and scrap materials (continued)	***Biological***—Possibility of stinging and biting insects, poisonous snakes; possibility of exposure to poison ivy, sumac.	Use appropriate insect repellants. Training to avoid and identify poisonous plants, insects, and snakes. Adhere to WESTON Bloodborne Pathogens Exposure Control Plan—First Aid Procedures FLD 43.
	Radiation—There are no radiological hazards expected because past uses do not indicate the use of radioactive material. Potential sun burn/sun poisoning hazard on bright, sunny days.	Use sun block as appropriate. Avoid direct exposure to sun for long periods of time. There is no known source of radioactive material at this site.

Table J-7
Hazard Analysis by Site Activity, Activity 6 - Closeout Activities

Activity	Hazards	Hazard Control
Restoration of work areas and the demobilization of all remaining equipment, temporary structures, and other items from the project site after project completion	***Chemical Hazards***—Contaminated source areas will have been removed, therefore, the risk level associated with these activities is low.	No intrusive measures allowed during this activity. Wear appropriate PPE for skin protection and to prevent dermal contact. Avoid liquid pools and stained areas if possible. An initial visual survey will be conducted to confirm the levels of protection are correct for the activity.
	Physical Hazards—Slip, trips, falls, equipment, materials, tools, terrain, uneven walking surfaces; weather hazards; poor visibility.	The work area will be visually inspected. Housekeeping – Slip, trip, and fall hazards will be either removed or marked and barricaded. Geophysical teams will be dealing with uneven terrain. Slips, trips, and fall hazards will be the most prevalent. Sufficient illumination will be maintained to ensure a safe working environment and weather conditions to be continuously monitored. The "buddy system" will be implemented. See FLD 02, FLD 11, FLD 12, and FLD 39.
	Caught in/between/struck by or against an object.	Workers will stay out of the swing area of all equipment and will not walk, work or stand near equipment being loaded or unloaded. No personnel will ride on the equipment unless seats are provided. See FLD 20, FLD 23, and FLD 24. Workers operating equipment and/or exposed to traffic hazards will wear traffic/reflectorized vests and hard hats. The handling and placement of heavy equipment will be carefully coordinated. A traffic control system for positioning and moving haul vehicles will be established. Heavy vehicle operators may remain in their vehicles only if they have cab over protection. If operators must check loads, loading will cease until the operator is back in the cabin or away from the vehicles in a safe location. Materials and objects will be inspected for rough or sharp edges, and appropriate precautions will be taken to avoid contact. Personnel will wear work gloves and avoid placing hands between objects. Backup alarms will be in operable condition. Unnecessary backing will be avoided. Safety toe footwear will be required. Tools will be properly used.

Table J-7
Hazard Analysis by Site Activity, Activity 6 - Closeout Activities

Activity	Hazards	Hazard Control
Restoration of work areas and the demobilization of all remaining equipment, temporary structures, and other items from the project site after project completion (continued)	Moving/heavy equipment operations.	Only trained, experienced operators will operate equipment. Equipment will be inspected daily. Personnel will be made aware of the hazard and will coordinate carefully during handling equipment operations. Personnel restricted in area of operation. Backup alarms functional. Stay out of the swing area of all equipment and from under loads. No personnel will ride on the equipment unless seats are provided. Guards will be kept in place during operation. Maintain safe distance from moving mechanical parts. Always use appropriate PPE. See FLDs 20, 22, 23, and 24.
	Fire	Flammable liquids will be stored in safety containers and flammable storage cabinets. Propane cylinders will be stored outside in secured areas. Fuel storage tanks will be placed in impermeable dikes. Properly rated fire extinguishers will be placed within 50 feet of the fuel storage area, in construction equipment, and strategically in the construction area. See FLDs 31 and 32.
	Noise exposure	High noise areas will be identified. Hearing protection will be provided as appropriate. The latest ACGIH TLVs will be used. Personnel operating chainsaws will use hearing protection. Hearing control program, which consists of audiometric examination; training; use of hearing protection; and sound level pressure monitoring when and where necessary. See FLD 01.
	Traffic	Work areas will be clearly barricaded using existing gates and appropriate signs displayed. Traffic will be rerouted as necessary. Persons working in traffic area, near roadways or directing traffic will wear high visibility (reflective) vests. Posted speed limit of 15 miles per hour. See FLD 20.
	Electric hazards	Generators will be grounded unless self-grounded. Extension cords will be properly rated for intended use. Prior to any intrusive activity, authorities will be contacted for permits. Elevated parts of machinery, ladders, and antennas will be kept at least 10 feet from overhead electric lines. Electrical installations will be made by qualified electricians. A lockout/tagout program consistent with FLD 42 will be used for equipment maintenance. Also refer to FLDs 34, 35, and 38.

Table J-7
Hazard Analysis by Site Activity, Activity 6 - Closeout Activities

Activity	Hazards	Hazard Control
Restoration of work areas and the demobilization of all remaining equipment, temporary structures, and other items from the project site after project completion (continued)	Inclement weather, heat/cold stress.	Personnel will be dressed according to weather conditions. Workers will be briefed and cognizant of heat and cold stress symptoms. Electrolyte/fluids replacement will be available to workers. Work rest periods will be established according to ACGIH, NIOSH guidelines, and FLDs 05 and 06. Personnel will be monitored. Salt will be applied to walkway and roadway surfaces where ice is a problem. As determined by the UXOSO, operations are to cease during severe weather conditions, see FLD 02 – Inclement Weather.
	Biological—Possibility of stinging and biting insects, poisonous snakes; possibility of exposure to poison ivy, sumac.	Use appropriate insect repellants. Training to avoid and identify poisonous plants, insects, and snakes. Adhere to WESTON Bloodborne Pathogens Exposure Control Plan—First Aid Procedures FLD 43.
	Radiation—There are no radiological hazards expected because past uses do not indicate the use of radioactive material. Potential sun burn/sun poisoning hazard on bright, sunny days.	Use sunblock as appropriate. Avoid direct exposure to sun for long periods of time.

Table J-8
Equipment and Training Requirements

Task/Activity	Equipment	Inspection	Training
Preliminary Activities: Mobilization of personnel, equipment, and supplies to the project site, setup of office and storage areas, and implementation of explosive storage area security upgrades	Magazine security upgrade equipment to be brought by subcontractor	Subcontractors will be required to conduct daily inspections and necessary maintenance for the equipment. Follow WESTON Inspection requirements per WESTON Health & Safety Program.	Equipment will be operated by qualified operators. An initial site-specific training will be conducted. Daily safety meetings will be conducted before beginning the work. Safe work practices and good housekeeping will be followed. Personnel will be informed of the contaminants and chemicals at the site and availability of Material Safety Data Sheet (MSDS).
Site Preparation Activities: Site surveying to delineate work areas and clearing of brush and small vegetation less than 4 inches in diameter in work areas	Survey equipment to be brought by subcontractor Weedwhackers and Chainsaws Schonstedt GA52/72	Subcontractors will be required to conduct daily inspections and necessary maintenance for the equipment. Follow WESTON Inspection requirements per WESTON Health & Safety Program. Weedwhacker and chainsaw operators will wear face mask, leg protection, hand protection, American National Standards Institute-approved footwear, and hearing protection. All equipment will be properly stored, inspected, maintained, and/or calibrated on a daily basis.	Workers involved in the clearing operation will be qualified and conduct activities in accordance with OSHA 29 CFR-1910.266 and U.S. ACE EM 385-1-1 Section 31. Daily safety meetings will be conducted before beginning the work to stress the importance of conducting all activities in a safe manner. Safe work practices and good housekeeping will be followed. Personnel will be informed of the contaminants and chemicals at the site and availability of MSDSs. Schonstedt's will be operated by qualified operators with 40-hr training with 8-hr refresher course.

Table J-8
Equipment and Training Requirements

Task/Activity	Equipment	Inspection	Training
MEC Operations: mag & flag operations to locate potential buried UXO, excavation and removal of potential MEC anomalies, and destruction/ disposal of UXO and scrap materials	Hand tools and earth moving machinery, as necessary. Schonstedt GA52/72.	All equipment will be properly stored, inspected, maintained, and/or calibrated on a daily basis.	Daily safety meetings will be conducted before beginning the work to stress the importance of conducting all activities in a safe manner. Safe work practices and good housekeeping will be followed. Personnel will be informed of the contaminants and chemicals at the site and availability of MSDSs. Schonstedt's will be operated by qualified operators with 40-hr training with 8-hr refresher course.
Closeout Activities: Restoration of work areas and the demobilization of all remaining equipment, temporary structures, and other items from the project site after project completion	Hand tools and earth moving machinery, as necessary.	All equipment will be properly stored, inspected, maintained, and/or calibrated on a daily basis.	Daily safety meetings will be conducted before beginning the work to stress the importance of conducting all activities in a safe manner. Safe work practices and good housekeeping will be followed. Personnel will be informed of the contaminants and chemicals at the site and availability of MSDSs.

APPENDIX A

Site Compliance Checklist

SITE COMPLIANCE CHECKLIST

	In Compliance?		
	Yes	No	N/A
1. SITE SAFETY AND HEALTH PLAN (SSHP)			
• Corporate Safety and Health Program (CSHP) available upon request.			
• Relevant CSHP Attachments, Programs, and Standard Operating Procedures (SOPs) on site and being followed.			
• Approved Work Plan on site, and SSHP Review Form signed by all site personnel.			
• Work Plan being followed in compliance with Data Item Descriptions (DIDs).			
2. HAZARD ASSESSMENT			
• Personal protective equipment (PPE) selected and provided for initial entry if potential for exposure above permissible exposure limits (PELs) exists.			
• A task hazard assessment has been conducted to identify the hazards associated with each task.			
• A certificate of task hazard assessment has been completed, which identifies the appropriate PPE and mitigation to be used to protect personnel from task hazards.			
3. SITE CONTROL			
• Site control plan is being implemented (i.e., buddy system, communication, site security, etc.).			
• Exclusion, contamination reduction, or support zones established and posted as per SSHP.			
• Site personnel following the standing orders for each zone.			
4. TRAINING PROGRAM			
• All personnel have received the required 40-hour Occupational Safety and Health Administration (OSHA) HAZWOPER training (or its equivalent), 8-hour refreshers, and supervisors course, if applicable.			
• Personnel have received three-day supervised training and the Three-Day Training form has been signed by all personnel.			
• Copies of all training certificates are on site.			
• Emergency response personnel have been designated and trained to handle anticipated emergencies.			
• Employees informed of potential risks and hazards identified for each task they are to perform.			
• Employees notified of chemical, physical, biological, and toxicological properties of identified or suspected contaminants.			
• Hazard Communication Training has been given to personnel who work with products containing hazardous substances, to include a review of the relevant Minimum Separation Distances.			
• Site personnel given OSHA required, hazard-specific training, such as PPE, Hearing Conservation, etc., and training forms completed.			

	In Compliance?		
	Yes	No	N/A
• At least two site personnel are trained in First Aid/CPR.			
5. MEDICAL SURVEILLANCE			
• Medical surveillance provided, as a minimum, to personnel who: are exposed at or above the PEL/threshold limit value (TLV), use respirators, or are a member of the emergency response team.			
• Provisions made for medical surveillance of personnel who receive a documented, unprotected over-exposure or develop signs and symptoms of exposure.			
• Site-specific medical tests, as required by the SSHP, have been conducted prior to site personnel participating in site activities where exposure can occur.			
• Physician's statement retained in employees' records on site.			
• Personnel with potential occupational exposure to blood or other potentially infectious body fluids have been given the opportunity to be vaccinated against Hepatitis B Virus (HBV), and personnel who decline have signed the HBV Vaccination Declination Form.			
6. ENGINEERING CONTROLS, EQUIPMENT, WORK PRACTICES, AND PPE			
• Engineering controls and safe work practices (SWPs) being used whenever feasible.			
• Equipment required by the work practices (WP) is on site, inspected, and in proper working order.			
• PPE has been selected according to the limitations of the PPE, site hazards, and the level and type of hazard.			
• Self-contained breathing apparatus (SCBA) or positive pressure supplied air line, including an emergency escape respirator, provided when known or potential immediately dangerous to life or health (IDLH) conditions exist.			
• All PPE is being inspected, used, cleaned, stored, and maintained in accordance with (IAW) the SSHP.			
• Respiratory protection being issued only to personnel who have been trained and medically approved to use respiratory protective equipment.			
• Personnel using respirators have been tested for the respirator being used.			
7. MONITORING			
• Monitoring equipment being calibrated, operated, and maintained IAW manufacturer's requirements, and calibration, monitoring, and maintenance records available.			
• Monitoring being conducted IAW the WP to:			
− Identify potential IDLH or explosive conditions.			
− Assess personal exposures to chemical and physical hazards.			
− Evaluate exposures when a change in tasks or location occurs.			
− Assess exposures when previously unidentified materials/hazards are identified.			
• High-risk workers monitored initially and all workers monitored if levels indicate the need.			
• Work area and perimeter monitoring being conducted IAW the WP.			

	In Compliance?		
	Yes	No	N/A
• Site monitoring log being completed for all personnel and area monitoring.			
8. HANDLING DRUMS AND CONTAINERS			
• Drums and containers used on site meet Department of Transportation (DOT), OSHA, and Environmental Protection Agency (EPA) regulations.			
• Drums and containers found on site are being inspected prior to being moved or handled.			
• All unlabeled drums and containers being handled as hazardous waste until identified as nonhazardous.			
• Drum and container movement being minimized.			
• Drums/containers opened IAW approved methods listed in the WP.			
• Drum sampling performed IAW the approved sampling plan to classify contaminants in drums/containers prior to bulking, temporary storage, and shipping.			
• Staging of drums and containers being conducted IAW the WP, and staging areas provided with adequate ingress/egress.			
• DOT salvage drums and adequate spill response materials available, and written spill containment program available.			
• Materials are assessed for compatibility prior to being bulked together.			
• Shock-sensitive waste being identified and handled appropriately.			
• Lab packs are opened by properly trained personnel.			
• Tanks and vaults containing hazardous substances handled IAW the WP and confined space procedures, if needed, are being used for entry.			
• Drums and containers being transported off site by a licensed hazardous waste hauler.			
9. DECONTAMINATION PROGRAM			
• Site workers properly trained and complying with the written decontamination procedures.			
• All potentially contaminated equipment, clothing, and PPE are being properly decontaminated.			
• All decontamination solutions are being containerized into approved storage containers at the end of each day.			
• Decontamination procedures evaluated for effectiveness.			
• On-site showers and change houses comply with 29 CFR 199.141.			
10. EMERGENCY RESPONSE			
• Written emergency response plan incorporated in the WP.			
• Written procedures for reporting incidents to local, state, and federal agencies.			
• Emergency response plan rehearsed and amended as needed.			

	In Compliance?		
	Yes	No	N/A
• First aid, burn, and eye wash kits available on site and in each vehicle, with a blood-borne pathogen control kit located with each first aid kit.			
• Adequate type, number, and size fire extinguishers appropriately located on site and inspected weekly.			
• Flammable storage areas properly posted.			
• Employee alarm system IAW the WP and practiced.			
11. ILLUMINATION			
• Adequate light levels provided in all office, storage, and work locations.			
12. SANITATION AND HOUSEKEEPING			
• Adequate supply of potable water available from labeled containers or outlets.			
• Non-potable water sources appropriately labeled, and no open or potential cross connection to potable sources exists.			
• Appropriate type and adequate number of toilets available.			
• Personnel wash facilities provided and located near site, but away from exposure potentials.			
• Shower/change facilities located away from exposure potentials and designed to comply with the requirements of 29 CFR 1910.141.			
• Site being maintained in a neat and orderly fashion, free of trash and debris.			
• Adequate number of trash cans with lids are located on site and emptied regularly.			

REMARKS, OBSERVATIONS, AND RECOMMENDATIONS	
Signature of Auditor:	Date:

APPENDIX K

Response to Comments

Response to Comments
DRAFT Group 1 Remedial Investigation/Feasibility Study Work Plan, dated May 23, 2008
Review Comments provided by Judy Huang of EPA, dated July 9, 2008

No.	Comment Type / Report Section	Comment/Response
1	EPA General Comment	**Comment**: The Draft Group 1 Remedial Investigation/Feasibility Study Work Plan, Seaside Munitions Response Area and Parker Flats Munitions Response Area Phase II, dated May 23, 2008, (hereinafter referred to as the Dft GP 1 RI/FS WP, Seaside & Parker Flats MRAs, Phase II), presents the Quality Control (QC) process to be used during the execution of the RI/FS in a fragmented manner. It is understood that some of this fragmentation is due to the format of the document that is prescribed by the RI/FS requirements. However, there is no identifiable portion of the document or its appendices that contains a listing of all of the activities to be evaluated by QC, the evaluation criteria for each activity evaluated, and the associated pass/fail criteria. A listing of this information would be very valuable for use during the execution of the work plan and would assist those evaluating the quality of these processes in their efforts. Please provide a table/chart that provides this information in an appropriate location in the body of the Dft GP 1 RI/FS WP, Seaside & Parker Flats MRAs, Phase II. **Response**: Quality control (QC) operations for Geophysics and Unexploded Ordnance (UXO) operations are defined in Section 5, Section 11, and Appendix E (Quality Assurance Project Plan) of Volume 2 of the Group 1 Remedial Investigation/Feasibility Study (RI/FS) Work Plan. The QC components in the Group 1 RI/FS Work Plan related to Geophysics and UXO operations have been consolidated into Appendix E, leaving Section 11 as the overarching Quality Control Plan. The QC components in Section 5 have been maintained, but now reference Appendix E. A table has also been incorporated into Appendix E that presents a quick reference for UXO and Geophysics QC operations.
2	EPA General Comment	**Comment:** The Draft GP 1 RI/FS WP, Seaside & Parker Flats MRAs, Phase II, refers to a number of teams throughout the document and its appendices. In most instances, the makeup of these teams is not provided. Some of the teams listed include: Excavation Team, UXO Team, UXO Intrusive Team, Brush Cutting Team, Geophysical Team, Chipper Team, Reacquisition Team, Dig Team, Field Team, Mechanical Vegetation Cutting Team, and ESCA RP Team. Some of these teams are defined by function and makeup in the document, but most are not. Please review the teams listed in the Dft GP 1 RI/FS WP, Seaside & Parker Flats MRAs, Phase II, and define the function and make up of each team when first introduced in the text or at another appropriate location that may be referenced at the first introduction of the team in the text.

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		Response: The definitions or identifications of the members that make up the teams mentioned throughout the report have been added to the document. In addition, the text has been revised to ensure consistent use of the various team names throughout the Group 1 RI/FS Work Plan **-** Volumes 1 and 2 (including the appendices).
1	EPA Specific Comment – Executive Summary, Sampling and Analysis Plan (Volume 2), Page xv	**Comment:** The next-to-last sentence in the third paragraph of this section on page xv, in referring to the results of the surface sweep, states that, "If significant subsurface MEC (either in high concentration or high risk unexploded ordnance) are discovered during the investigation, the immediate vicinity may be intrusively investigated to ascertain the limits of the condition." The use of the word "may" in this sentence raises a concern as to the criteria that will make this further investigation obligatory. Please revise the cited section of the Executive Summary to state the specific criteria that will be used to determine whether the noted intrusive investigation will be initiated, or reference where this information may be found elsewhere in the document or its appendices. **Response:** This work plan does not contain specific criteria that will be used to determine whether intrusive investigation will be initiated. Therefore, the Executive Summary (as well as corresponding text in Section 4.5.2 of Volume 1 and Sections 2.2.1 and 2.3.7 of Volume 2) has been revised as follows to clarify the approach: "The purpose of the surface sweep in the accessible 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-*** ~~sub~~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*** ~~the immediate vicinity may be intrusively investigated~~ to ascertain the limits of the condition."
2	EPA Specific Comment – Volume 1, Work Plan, Section 4.7, Explosives	**Comment**: The last sentence of the first paragraph of this section states that, "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 a MEC item combined with the potential of the item to cause a serious injury if detonated." While many of

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	Safety Risk Assessment, Page 4-7	the munitions items that may be found on the sites of concern can detonate, some are items that do not detonate, but burn or eject pyrotechnic cargoes that burn when they function. Based on this differing results of a munitions item functioning due to stimulus from a personal encounter, a better description of the results would be achieved if the words "it functions" replaced the word "detonated" in the cited sentence. Please make this correction here and elsewhere as appropriate in the Dft GP 1 RI/FS WP, Seaside & Parker Flats MRAs, Phase II. **Response**: The sentence has been revised as follows: "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 ~~detonated~~ ***it functions***."
3	EPA Specific Comment – Volume 1, Work Plan, Appendix A, Seaside MRA Conceptual Site Model, Section 4.1.3, Historical Military Use, Page 4-2	**Comment**: The last sentence in this section notes that, "It is expected that munitions activity associated with these ranges would have occurred within the firing points." This statement may not be accurate, depending on the definition applied to the term "munitions activity." Please revise this section to include a description of what constitutes "munitions activity," or expand it to better explain the intent of the cited sentence. **Response**: The last sentence of this section has been revised as follows: "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 (Figure 4.1-2). It is expected that munitions activity associated with these ranges would have occurred within ***the range fans associated with*** the firing points. ***A munitions activity is intended to include military training activities at or near the range that involve the use or handling of military munitions.***"
4	EPA Specific Comment – Volume 1, Work Plan, Appendix A, Seaside MRA Conceptual Site Model,	**Comment**: This section presents a general discussion of the potential exposure pathways from munitions items that may currently be present on the Seaside MRA. The results of this analysis are referenced as presented in Table 4.6-1, Seaside MRA – Potential Receptors and Exposure Media. The potential receptors listed include Construction Worker, Utility Workers, Trespassers, Firefighters, Emergency Response Workers, Ancillary Workers, Residents, and Recreational Users. The table divides these receptors into two categories,

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	Section 4.6, Seaside MRA Pathway Analysis, Page 4-11	which are Current and Future. The Exposure Media listed is Ground Surface and Below Grade. None of the potential receptors are listed as being potentially exposed to MEC present on the ground surface either in the Current or Future periods. Also, only the Construction Workers, Utility Workers, Firefighters, and Residents are identified as being potentially exposed to MEC present in the subsurface. The Trespassers, Emergency Response Workers, Ancillary Workers, and Recreational Users are listed as having no potential exposure to MEC present on the Ground Surface or in the Subsurface during either time period. No details as to how these determinations were made are provided in the cited section. No MEC removal action short of complete excavation and removal (or screening) of the soil to the potential penetration depths of the munitions used will provide a complete assurance that no MEC remains on the site so treated. Based on this fact, the presence of MEC on and beneath the surface of the Seaside MRA cannot be ruled out, both before and after surface and subsurface removals have been conducted. Therefore, any person entering the site has the potential to contact MEC on the surface, and any person conducting any intrusive activity on the site has the potential to contact subsurface MEC, both prior to and after the removal actions have been completed. Please review the cited section and table and revise them as necessary to present the correct exposure potential for the listed receptors. **Response**: Table 4.6-1 has been revised to include a complete analysis of receptors and potential exposure media/scenarios.
5	EPA Specific Comment – Volume 1, Work Plan, Appendix A, Seaside MRA Conceptual Site Model, Table 4.1-4, Seaside MRA – Historical Military Use, Page 4-17	**Comment**: In the row entitled “Range 23M,” the second bullet in the Description column lists “Dragon Rounds” as having been found on this range. As “Dragon rounds” would be an unfired missile, this is highly unlikely. Please review the cited table and correct it as necessary. **Response**: Although it is agreed that the term Dragon “rounds” may be misleading or incorrect, the statement that they were used or found on Range 23M comes from the Archives Search Report prepared by the USACE in October 1993. The Archives Search Report presents information obtained through historical research at various archives and records holding facilities, interviews with individuals associated with the site or operations, and personal visits to the site. The Archives Search Report indicates that Ordnance Items Found or

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		Utilized on Range 23M were "Dragon missiles (practice and HEAT), 4.2" Mortar." The report does not differentiate between items that were found and items that were used. The term "round" has been revised to include the full nomenclature as reported in the Archive Search Report, but no other changes have been made to the tables.
6	EPA Specific Comment – Volume 1, Work Plan, Appendix A, Seaside MRA Conceptual Site Model, Figure 4.6-1, Seaside MRA Pathway Analysis Flowchart	**Comment**: In the column entitled "Expected MEC Contamination," some of the boxes in the column list "MD" as a possible component. As MD is not a subcomponent of MEC, this is technically an incorrect usage. Either the column heading should be revised to replace the term "MEC" or the MD should be removed from the noted boxes in the column. Please correct this as needed. In addition, the column entitled "Secondary Sources" lists both Ground Surface and Below Grade as the initial media contaminated by MEC. However, the Ground Surface source is not continued to completion on the flowchart, as is the case with the Below Grade category. Please complete the evaluation of this source in the flowchart. **Response**: MD has been removed from the boxes in the analyses. In addition, the figure has been updated to reflect a completed pathway analysis through the four remaining columns for the Ground Surface category.
7	EPA Specific Comment – Volume 1, Work Plan, Appendix B, Parker Flats MRA Conceptual Site Model, Section 5.6, Parker Flats MRA Pathway Analysis, Page 5-10	**Comment**: This section presents a general discussion of the potential exposure pathways from munitions items that may currently be present on the Parker Flats MRA. The results of this analysis are referenced as presented in Table 5.6-1, Parker Flats MRA – Potential Receptors and Exposure Media. The potential receptors listed include Construction Worker, Utility Workers, Trespassers, Firefighters, Emergency Response Workers, Ancillary Workers, Residents, and Recreational Users. The table divides these receptors into two categories, which are Current and Future. The Exposure Media listed is Ground Surface and Below Grade. With the exception of Emergency Response Workers and Residents, all of the potential receptors are listed as being potentially exposed to MEC present on the ground surface, either in the Current or Future periods. An exception is the Recreational User, who is not listed for the Current period. Also, the Trespassers, Emergency Response Workers, Ancillary Workers, and Recreational Users are identified as not being potentially exposed to MEC present in the subsurface. Only the Emergency Response Workers are listed as having no potential exposure to MEC present on the Ground Surface or in the Subsurface during either time period. No details as to how these

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		determinations were made are provided in the cited section. As has previously been noted, no MEC removal action short of complete excavation and removal (or screening) of the soil to the potential penetration depths of the munitions used will provide a complete assurance that no MEC remains on the site so treated. Based on this fact, the presence of MEC on and beneath the surface of the Seaside MRA cannot be ruled out, both before and after surface and subsurface removals have been conducted. Therefore, any person entering the site has the potential to contact MEC on the surface, and any person conducting any intrusive activity on the site has the potential to contact subsurface MEC, both prior to and after the removal actions have been completed. Please review the cited section and table and revise them as necessary to present the correct exposure potential for the listed receptors. **Response**: Table 5.6-1 has been revised to include a complete analysis of receptors and potential exposure media/scenarios.
8	EPA Specific Comment – Volume 1, Work Plan, Appendix B, Parker Flats MRA Conceptual Site Model, Table 5.3-2, Parker Flats MRA Phase II – Removal Activities, Page 5-22	**Comment**: In the row entitled “MRS-15MOCO.2,” the fourth bullet in the Summary column has a sentence that states, “This operation identified areas [or an area? Areas is correct] of obstructions/interferences such as asphalt, and material from the Range 45 pad, or telephone poles as SCA (Parsons 2004b).” Either this sentence is very poorly constructed or editorial comments have not been expunged from the table. Please review this table and correct it as necessary. **Response**: The table has been revised and the editorial comment removed.
9	EPA Specific Comment – Volume 1, Work Plan, Appendix B, Parker Flats MRA Conceptual Site Model,	**Comment**: In the column entitled “Expected MEC Contamination,” the box in the column list “MD” as a possible component. As MD is not a subcomponent of MEC, this is technically an incorrect usage. Either the column heading should be revised to replace the term MEC or the MD should be removed from the noted box in the column. Please correct this as needed. In addition, the column entitled “Secondary Sources” only lists Below Grade as the initial media contaminated by MEC. However, the Ground Surface

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	Figure 5.6-1, Parker Flats MRA Pathway Analysis Flowchart	source is discussed in Section 5.6.1, Exposure Pathways, and is also referenced in Table 5.6-1, Parker Flats MRA – Potential Receptors and Exposure Media. Please provide an evaluation of this source in the flowchart. **Response**: MD has been removed from the boxes in the analysis. In addition, the figure has been updated to reflect a completed pathway analysis for the Ground Surface category.
10	EPA Specific Comment – Volume 2, Sampling and Analysis Plan, Section 2.2.1, Parker Flats MRA – Phase II Remedial Investigation, Page 2-2	**Comment**: The last sentence in the third paragraph of this section, in referring to the results of the surface sweep, states that, "If significant subsurface MEC (either high concentration or high risk unexploded ordnance [UXO]) are discovered during the investigation, the immediate vicinity may be intrusively investigated to ascertain the limits of the condition." The use of the word "may" in this sentence raises a concern as to the criteria that will make this further investigation obligatory. Please revise the cited section to state the specific criteria that will be used to determine whether the noted intrusive investigation will be initiated, or reference where this information may be found elsewhere in the document or its appendices. **Response**: This work plan does not contain specific criteria that will be used to determine whether intrusive investigation will be initiated. Therefore, Sections 2.2.1 and 2.3.7 of Volume 2 have been revised as follows to clarify the approach: <u>Section 2.2.1</u> "The purpose of the surface sweep in the accessible 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-***~~sub~~surface MEC (either high concentration or high-risk unexploded ordnance [UXO]) ***has been*** discovered during the investigation, ***a field variance will be developed to change the investigation approach to include a focused intrusive investigation*** ~~the immediate vicinity may be intrusively investigated~~ to ascertain the limits of the condition." <u>Section 2.3.7</u> "Any MEC items encountered on the surface will be immediately reported to the SUXOS, surveyed with a GPS unit for documentation purposes, and handled in accordance with the proper handling procedures. If an anomaly is

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		detected using analog instruments, the UXO Technician will investigate the anomaly to a depth of 3 inches. ~~If MEC items are recovered during this task this information will be noted and additional investigation will be proposed for this area.~~ If the anomaly cannot be located within the top 3 inches of soil surface, the soil will be replaced and the location will be flagged and surveyed using a GPS instrument***, if coverage is available. In the event that GPS coverage is not available, the anomaly will be marked on the grid map and the coordinates will be manually entered***. The SUXOS will summarize a list of anomalies that could not be fully investigated and/or areas where MEC was found that require additional investigation. ***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.***"
11	EPA Specific Comment – Volume 2, Sampling and Analysis Plan, Section 2.3.5.1, Excavation of Digitally Reacquired Anomalies, Page 2-9	**Comment**: The last sentence in this section states, "If MEC are encountered that are suspected of containing unknown filler, MEC extinction will be conducted in accordance with the SOP for MEC with Unknown Filler presented in Appendix D of this G1 SAP." Please explain the reason for the use of the word "extinction" in this sentence and what it entails. **Response**: The word extinction has been replaced with ***disposition*** in the text. The activities associated with disposition of the MEC items suspected of containing unknown fillers are described in Appendix D (the SOP for MEC with Unknown Filler), as described in the text.
12	EPA Specific Comment – Volume 2, Sampling and Analysis Plan, Section 5.25, Geophysical QC Surveys, Page 5-19	**Comment**: In the three sub-elements (QC-1, QC-2, and QC-3) of the first paragraph of this section, the basic concepts of these three QC steps are identified. However, no specific resurvey percentage (or reference as to where this may be found elsewhere in the document or its appendices) is provided for QC-2 and QC-3. Please provide the percentages to be resurveyed, a discussion of how they will be resurveyed, a discussion of how they will be determined, or a reference as to where these may be found elsewhere in the Dft GP 1 RI/FS WP, Seaside & Parker Flats MRAs, Phase II, or its appendices. **Response**: The three introductory bullets in Section 5.25 identifying the three sub-

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		elements were revised to identify the percentages for QC: QC-1: ***Analog*** verification of anomaly removal at ***100% of the anomalies*** ~~each anomaly~~ selected for excavation. QC-2: Digital resurveying of ***an area greater than or equal to 16% of the DGM*** ~~a percentage of the~~ investigation areas. QC-3: Analog resurveying of ***at least*** 10% ~~a percentage~~ of each ***100-ft by 100-ft*** grid. The three unnumbered subsections immediately following these bullets in Section 5.25 describe each of the sub-elements. These subsections have been updated to clarify percentages and area determination.
13	EPA Specific Comment – Volume 2, Sampling and Analysis Plan, Appendix B, Parker Flats MRA Phase II – Types of MEC Removed and Hazard Classification, Page B-2	**Comment**: The table lists an item as follows: “High explosive, 40 mm (model unknown).” It is unclear as to whether this is a cartridge or projectile. Please revise the entry to provide this information, if available. **Response**: This information was obtained from the Army’s database. Based on a similar comment provided by the EPA on the Draft SEDR, the following footnote has been added to the table: “***Munitions descriptions have been taken directly from the Army’s MMRP Database and/or other historical documents. Any errors in terminology, filler type, and/or discrepancies between model number and caliber/size are a result of misinformation from the data sources.***”

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1	Army Specific Comment, P.1-3, Section 1.3.1, last paragraph	**Comment**: The last sentence should be revised to clarify that the consultations resulted in biological opinions (BOs) that allow impacts to and incidental take of listed species during MEC remedial activities but require mitigation measures to be implemented during the munitions response activities to reduce and minimize impacts to the protected species and their habitats. **Response**: A sentence has been added to the end of the paragraph to provide clarification: "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.***"
2	Army Specific Comment, p.2-5, Section 2.3.2 Future Land Use	**Comment**: In addition to the 1997 Fort Ord Base Reuse Plan, the 2002 *Assessment East Garrison – Parker Flats Land Use Modifications* is applicable and should be introduced in this section. **Response**: The following text has been added to Section 2.3.2 regarding the future land use for the Seaside and Parker Flats MRAs: "***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).***"
3	Army Specific Comment, p.3-1, Section 3.2 Parker Flats MRA Phase II Evaluation	**Comment**: There is a 1.1-acre portion of MRS-13B that overlaps parcel E19a.2. This area was called "MRS-13B Habitat Reserve" in the Final Track 2 Munitions Response RI/FS for the Parker Flats MRA (Phase I). No MEC item was recovered from the MRS-13B Habitat Reserve during the subsurface MEC removal that was previously conducted. Remedial investigation and risk assessment for this area are complete and documented in the final Track 2 RI/FS report. However, as described in the feasibility study (FS), Section 2.1.1 Assessment of Reuse Areas for FS Analysis, this area was not included in the FS (therefore the subsequent Proposed Plan) due to its small size. A

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		decision was made that an evaluation of remedial alternatives (if response is required) for the MRS-13B Habitat Reserve should be conducted when the rest of the habitat reserve property (E19a.2) is evaluated in an RI/FS and ROD. Please reflect this information and include the MRS-13B Habitat Reserve Reuse Area in the Group 1 FS. **Response**: The 1.1-acre portion of MRS-13B that extends into the Habitat Reserve area of the Parker Flats MRA Phase II will be included in the FS analysis conducted as part of the Group 1 RI/FS.
4	Army Specific Comment, p.4-5, Section 4.4 RQA Pilot Study	**Comment**: Please state whether this pilot study is intended to satisfy the requirement of the ESCA for a RQA pilot study. **Response**: The text has been revised as follows: "In an effort to satisfy regulatory concerns, ~~a QA process~~ ***the RQA process*** was developed ~~that will~~ 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. This effort is also intended to satisfy the requirements of the ESCA for an 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."
5	Army Specific Comment, p.4-6, Section 4.5.2 Parker Flats MRA Phase II	**Comment**: To reduce potential confusion, please clarify that "non-residential" means non-residential development, and does not include habitat reserve. Please also consider "habitat reserve" as a land use category name since "habitat reserve" was used in Volume 2, Section 2.1 and Figure A-1. **Response**: The text has been revised to state "Residential and Non-Residential ***Development*** Areas" and "Habitat ***Reserve*** Areas."

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6	Army Specific Comment, p.4-7, Section 4.5.2 Parker Flats MRA Phase II, last paragraph	**Comment**: This section describes that the surface sweep will involve investigation of shallow anomalies within 3 inches. Please describe if deeper anomalies that are not completely investigated will be documented. Same comment applies to Volume 2, p.2-2, Section 2.2.1. **Response**: This work plan does not contain specific criteria that will be used to determine whether intrusive investigation will be initiated. Therefore, Section 4.5.2 of Volume 1 has been revised as follows to clarify the approach: "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 feel that*** significant ***near-*** ~~sub~~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*** ~~the immediate vicinity may be intrusively investigated~~ to ascertain the limits of the condition."
7	Army Specific Comment, p.4-11, Section 4.10 Community Relations, first paragraph	**Comment**: The Community Involvement and Outreach Program (CIOP) Plan does not amend the Fort Ord Community Relations Plan; however, it is an enhancement to this existing plan. Please revise the sentence as follows: "The CIOP Plan is an addendum to the Army's former Fort Ord Community Relations Plan." Please also see the Army's comments to similar text that appeared in Draft CIOP Plan. **Response**: The text has been revised to state that the CIOP Plan is an ***addendum*** to the Army's former Fort Ord Community Relations Plan.
8	Army Specific Comment, p.4-12, Section 4.10.3	**Comment:** **a.** Bullet 1. It is indicated "all CSUMB faculty, staff, and students residing in campus housing will receive a copy of the newsletter while school is in session." should be re-evaluated. Suggestion to instead describe the actions that FORA and/or the ESCA RP Team will take to reach out to the CSUMB. **b.** Bullet 1. It is indicated that the FORA newsletters will be posted on the Army's Fort Ord cleanup website. It would be more accurate to state that FORA newsletters that are posted on FORA's website are available by hyperlink to FORA's website from

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		www.fortordcleanup.com/community/factsheets.asp. **c.** Bullet 5. It is indicated that FORA factsheets will be included into the Information Repositories. Information Repositories are maintained by the Army and typically does not include factsheets. Please revise the text to the effect. **d.** Bullet 8. The text as written can be mis-interpreted as suggesting that FORA and/or the ESCA RP Team is maintaining the Fort Ord Administrative Record and the Information Repositories. Please revise the text to the effect that FORA and/or the ESCA RP Team will submit RI-related documents to the Army for inclusion in the Administrative Record. **Response:** **a and b.** The text in the first bullet has been revised as follows to address comments a and b: • 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~~ ***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 affect access routes, CSUMB cross country trails, and other campus sponsored activities. FORA will also participate in CSUMB outreach activities as appropriate.*** **c.** The fifth bullet has been revised as follows: • 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, ~~in the Information repositories,~~ and at community involvement activities. **d.** The last bullet has been revised as follows: • ~~Maintain~~ ***Provide copies of RI-related documents to the Army for inclusion in*** the ***Army-maintained*** Information Repositories and

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		Administrative Record ~~to include RI-related documents~~.
9	Army Specific Comment, p.5-1. Section 5.2 Task 2 Community Relations	**Comment:** The last two sentences indicate that the Army's previous versions of Community Relations Plans (CRPs) have been superseded by the current CIOP Plan and the CRP Update Number 3. To clarify, please revise the text to read "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." **Response:** The paragraph has been revised as follows: "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 previous MEC-related community relations programs implemented at the former Fort Ord were described in the CRP (Army 1998), the CRP Update Number 1 (Army 2000), and the CRP Update Number 2 (Army 2001). These plans have been superseded by the current CIOP Plan and the CRP Update Number 3 (Army 2006).~~ ***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.***"
10	Army Specific Comment, p.5-2, Section 5.5 Task 5 Data Evaluation	**Comment:** This section indicates that the results of this task will be presented to stakeholders prior to proceeding to the risk assessment. Please describe how this coordination will be accomplished. **Response**: The section has been revised as follows: "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***

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		(e.g., Community Involvement Workshop meeting, ESCA Community meeting, ESCA newsletter, and/or ESCA Fact Sheet). ~~stakeholders prior to proceeding to the risk assessment.~~"
11	Army Specific Comment, p.5-2, Section 5.6 Task 6 Risk Assessment	**Comment**: This section indicates that the results of this task will be presented to stakeholders prior to proceeding to the development of alternatives. Please describe how this coordination will be accomplished. **Response**: The last paragraph of this section has been revised as follows: "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 ~~stakeholders~~ ***community stakeholders at a community meeting on the Draft RI/FS report***."
12	Army Specific Comment, Table 1 Potential Applicable or Relevant and Appropriate Requirements (ARARs)	**Comment**: Please review the "remarks" column so that they address the planned/anticipated CERCLA actions for the Group 1 MRAs. **Response**: The ARARs table was provided to show the list of potential ARARs considered for the Group 1 RI/FS. These potential ARARs will be further evaluated and refined during Task 10, Remedial Alternatives Evaluation. At this time the "Remarks" column has been revised to replace references to the Army.
13		**Comment**: Please include an acknowledgement of sponsorship pursuant to ESCA Section D.11. **Response:** The following statement has been added to the end of Section 1.0: ***"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."***

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14	Army Specific Comment	**Comment**: Please coordinate any outreach activities targeting the Department of Defense (DoD) communities that may be affected by the planned field investigation (Fitch and Marshall housing areas, DoD Center) and associated possible road closures with the BRAC Fort Ord Field Office. Our Point of Contact for this matter is Melissa Broadston at 831-393-1284. **Response**: Outreach activities targeting the DoD communities will be coordinated with Melissa Broadston (or other appropriate BRAC representative). No revisions have been made to the text in response to this comment.
15	Army Specific Comment, p.1-1, Section 1.0. First paragraph	**Comment**: Please replace the phrase “ordnance and explosives” with the more recent term “military munitions.” **Response**: The term “ordnance and explosives” has been replaced with the term “military munitions.”
16	Army Specific Comment, p.1-2, Section 1.3.1	**Comment**: Please see the Army’s comments to similar text that appeared in Draft Summary of Existing Data Report (SEDR), Section 2.2. **Response**: The text has been revised to reflect comments received on the Draft SEDR and incorporated into the Draft Final SEDR submitted in June 2008.
17	Army Specific Comment, p.2-2, Section 2.2.1 Parker Flats MRA Phase II Remedial Investigation	**Comment**: This section discusses that the investigation of residential and non-residential development areas will entail 100% digital geophysical investigation to the depth of detection. While the plan for structure removal was clarified in Appendix C: Building Demolition and Removal Plan, it is not clear how paved areas such as roads will be handled during the investigation. Please provide additional text to clarify. **Response**: Section 2.2.1 was revised as follows: “The investigation areas include property designated for future residential, nonresidential, or habitat reserve. ***Improved roads will not be intrusively investigated.*** Digital geophysical mapping (DGM) investigations, using the Best Available and Appropriate Detection Technology (BADT) will be performed in residential and nonresidential development areas. The investigation of residential and nonresidential development areas will entail 100 percent DGM investigations to the depth of detection. Areas that are not suitable for DGM (e.g., dense oak woodland where data collection is not

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		possible) will be investigated using analog detection."
18	Army Specific Comment, p.2-8, Section 2.3.5.1 Excavation of Digitally Reacquired Anomalies	**Comment**: Fourth paragraph discusses inspecting discovered MEC items to confirm that it is MEC, MD or other scrap, and that MD and scrap will be transported offsite for disposal or recycling. Please also discuss whether MD will be inspected and certified free of explosives hazard before it is shipped offsite. **Response**: The following revisions have been made to the paragraph: "The MEC items located will be initially classified as materials potentially presenting an explosive hazard (MPPEH) until the items are fully inspected and can be identified as MEC, MD, or metal scrap. MD and metal scrap will be transported from the investigation area and stored until it can be disposed of by a foundry and/or recycler, where it will be processed through a smelter, shredder, or furnace prior to resale or release. ***Prior to leaving the MRA, the MD and metal scrap will be inspected by a SUXOS and a UXOQCS to verify that it is free from explosives (FFE).*** The MD will be shredded and recycled at an authorized recycler."
19	Army Specific Comment, p.5-21, Section 5.25 Geophysical QC Surveys, QC-2 Geophysical Resurveying	**Comment**: The second paragraph discusses failure criteria of a discovery of an MEC or MEC-like item, or five re-acquirable anomalies. Please clarify whether this QC criteria is applied to each 100' x 100' grid, or to the entire footprint of geophysical investigation. **Response:** The second paragraph has been revised to clarify that the failure criteria is applied to each 100-ft by 100-ft grid or partial grid.
20	Army Specific Comment, Section 7.0 Location Surveys and Mapping Plan	**Comment**: It is our understanding that the ESCA RP Team is in the process of developing a procedure for migrating the munitions response data into the Army's MMRP database, and that you have been coordinating this effort with our MMRP database manager. Please include this procedure into the final version of the Group 1 RI/FS Work Plan to ensure that necessary data is collected throughout the project and available for submission at the end of the project. **Response**: The following information has been added to Section 7.1: ***"The Army has requested that FORA provide final MEC and MD finds, geophysical operations, and MEC demolition activity data. FORA and the Army are working together to identify the data needs to be provided in an agreed upon format. Data transfer from FORA to the Army will occur following the release of the associated final report."***

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21	Army Specific Comment	**Comment**: Please include a procedure for handling a situation in which possible Army obligations, as defined in the ESCA, are discovered during the remedial investigation. **Response**: A discussion of Army-retained conditions and an outline for the notification procedures to be followed has been added as Section 2.7 of Volume 2 of the Group 1 RI/FS Work Plan. The text reads as follows: ***The ESCA and the AOC identify certain Army-retained conditions for which the Army assumes responsibility. If these conditions are encountered during field operations, FORA is required to notify the Army of their presence in accordance with the guidelines set forth in the ESCA and the Army assumes responsibility. Included in the Army-retained conditions are:*** • ***Radiological material*** • ***Chemical or biological warfare agents*** • ***Natural resource injuries or damages occurring as a result of contamination releases that have occurred due to Army ownership or activities on the MRA except to the extent such injuries are a direct result of FORA's activities on the MRA*** • ***Unknown uninsured conditions, which include the management and cleanup of non-MEC-related hazardous and toxic wastes above insurance parameters*** • ***Perchlorate contamination in soil or groundwater*** ***Recognition of these types of conditions in the field may include, but are not limited to:*** • ***oily, shiny, or saturated soil or free product*** • ***soil with strong chemical odor*** • ***discovery of objects of environmental concern such as underground storage tanks and associated piping, buried drums, etc.*** • ***discovery of suspected debris of environmental concern (i.e.,***

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		buried refuse, asbestos-containing pipes, and Transite™) • ***other conditions that vary materially from those documented during previous investigations*** • ***discovery of areas containing high concentrations of spent ammunition*** • ***discovery of bulk explosives*** ***The field personnel involved in fieldwork activities will be briefed on the recognition of these types of conditions in the field and will be instructed to be on the alert for these conditions and to promptly report such conditions to the site manager, if encountered.*** ***If a suspected Army-retained condition is encountered during the field investigation activities, the following procedures will be followed:*** 1. ***All MEC field activities that may potentially disturb the "suspected" condition will be immediately stopped.*** 2. ***If there is no immediate danger to personnel, an appropriate exclusion zone will be designated with a marker and/or a barricade will be erected around the suspect area to prevent further soil disturbance in this area.*** 3. ***If an emergency situation requiring medical attention, containment assistance, or other emergency assistance arises, the emergency procedures specified in the Site Safety and Health Plan (SSHP) provided as Appendix J will be followed.*** 4. ***The site manager for the contractor or subcontractor will immediately notify the appropriate ESCA RP Team representative. The ESCA RP Team representative will notify the Army immediately, and FORA and the appropriate regulatory agencies within 24 hours.***
22	Army Specific Comment, p.12-5, Section 12.3.2.3	**Comment**: **a.** Paragraph #2. The statement that excavated areas will be allowed to revegetate naturally applies to typical mag and dig operations. However, if excavations are larger and disturb more than one acre and more than 100 feet in width, then passive and active restoration with follow-up monitoring will be necessary. This will be evaluated on a case-by-case basis and coordinated with the Army BRAC Office. **b.** Last paragraph. The paragraph states that restoration monitoring will occur in accordance with Chapter 4 of the HMP. However, the requirement

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		to monitor vegetation in Habitat Reserve areas is described in Chapter 3 of the HMP. **Response**: **a.** The ESCA RP Team agrees with the Army that natural revegetation applies to typical mag and dig operations as well as digital mapping operations (DGM) operations, which are both being conducted at the Parker Flats MRA Phase II under the Group 1 RI/FS Work Plan. Although the ESCA RP Team does not anticipate conducting excavations that will disturb an area more than one acre and more than 100 feet in width, passive and active restoration with follow-up monitoring will be conducted in accordance with the procedures described in the Habitat Restoration Plan prepared for the Site 39 Inland Ranges. The text has been revised as follows: "Per the HMP, excavated areas will be allowed to revegetate naturally. ***If the excavation disturbs an area more than one acre and more than 100 feet in width, passive and active restoration with follow-up monitoring will be conducted in accordance with the procedures described in the Habitat Restoration Plan prepared for the Site 39 Inland Ranges (Denise Duffy & Associates 2008).*** **b.** The text has been revised to state that vegetation monitoring will occur in accordance with Chapter 3 of the HMP.
23	Army Specific Comment, Appendix D: Standard Operating Procedures	**Comment**: Standard Operating Procedure for MEC with Unknown Filler. Section 5.1 General. Bullet 7 indicates that the standard reporting procedure is for FORA to contact the Presidio of Monterey Police Department (POMPD) who will notify the Technical Escort Unit (TEU). After the property is transferred to FORA, the standard procedure for such notification should be from FORA to local law enforcement agency to the EOD unit assigned to the region. If the EOD unit determines that a response by TEU is needed, it would complete such notification. In addition, FORA should notify the POMPD and the BRAC Fort Ord Field Office when it notifies the local law enforcement agency. **Response**: The SOP has been revised to reflect the notification procedure to be followed after land transfer in the event MEC with unknown filler is found.
24	Army Specific Comment, Appendix F: Residential Quality	**Comment**: Section F-2.1 RQA Pilot Study Test Areas. It is our understanding that the test area RQA-2 contains a portion that may not be developed for residential use (a portion of Parcel E18.1.1, a part of the veterans cemetery project). Please re-assess the suitability of this site for RQA pilot study

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	Assurance Pilot Study Work Plan	implementation given the uncertainty in the future use. **Response**: The RQA-2 area and the RQA-1 area have been removed from the work plan as these areas may not be developed for residential use. The area planned for residential use in the CSUMB MRA has been added to the work plan to replace the RQA-1 and RQA-2 areas in the RQA Pilot Study. The Executive Summary presented in Volume 1, applicable sections of Volume 2, and Appendix F of Volume 2 have been revised to reflect this change in scope.
25	Army Specific Comment, Appendix F: Residential Quality Assurance Pilot Study Work Plan	**Comment**: The Army will provide additional review comments on the Residential Quality Assurance Pilot Study Work Plan after regulatory agencies provide their inputs. **Response**: No additional comments have been received to date.
26	Army Specific Comment, Table 5-1, Recovery and Penetration Depths of MEC Previously Encountered in Parker Flats MRA Phase II	**Comment**: One of the footnotes describes MRA as “Munitions Response Site.” Please correct this to “Munitions Response Area.” **Response**: The footnote description has been changed to “***Munitions Response Area***”.
27	Army Specific Comment, Appendix B: MEC Data	**Comment**: The Hazard Classification table describes hazard classification 0 as “Inert MEC that will cause no injury.” By definition MEC is explosive in nature, therefore category 0 or “inert” classification is not possible for a MEC item. Classification 0 should be described as “inert munitions item that will cause no injury” instead. **Response**: The description for hazard classification 0 has been revised to read “***inert munitions item that will cause no injury.***”
28	Army Specific Comment, Appendix F: Residential Quality	**Comment**: The legend describes hazard classification 0 as “Inert MEC that will cause no injury.” By definition MEC is explosive in nature, therefore “inert” classification is not possible for a MEC item. Classification 0 should be described as “inert munitions item that will cause no injury” instead.

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	Assurance Pilot Study Work Plan. Figure F-2	**Response**: The figure has been revised to read "***inert munitions item that will cause no injury.***"
29	Army Specific Comment, Appendix I: Explosives Siting Plan. Section 1.6.1	**Comment**: Detonation Site Blow-In Place. The second to the last bullet discusses that after property transfer, fire risk assessment for planned detonations will be conducted by the City of Seaside Fire Department. Please verify if this is the case since the majority of the investigation area is within the jurisdiction of the Monterey County. **Response:** The second to the last bullet in Section 1.6.1 of Appendix I has been revised as follows: • "Request Presidio of Monterey Fire Department (POM FD) to perform an on-site fire risk assessment. For planned detonations, risk assessments require a 3-day notification and demolition shots require a 5-day notification. POM FD will expedite risk assessments for demolition shots that cannot be delayed. Following property transfer, requirements for risk assessments will be determined by the City of Seaside Fire Department, ***if the detonation is being conducted within the jurisdiction of the City of Seaside, or by the Salinas Rural Fire District, if the detonation is being conducted within the jurisdiction of Monterey County***."
30	Army Specific Comment, Appendix J: Site Safety and Health Plan. Section J-12.4	**Comment**: Offsite Emergency Response Services. Table J-6 Emergency Contacts lists City of Seaside police and fire agencies. Please verify whether Monterey County law enforcement and fire agencies need to be identified, since the majority of the investigation area is within the jurisdiction of the Monterey County. **Response**: The following contact information has been added to Table J-6: Emergency Contacts: ***Salinas Rural Fire District (831) 455-1828*** ***Monterey County Sheriff (831) 755-3801***

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Review Comments provided by Marina Equestrian Association, dated September 24, 2008

No.	Comment Type / Report Section	Comment/Response
a.	Specific Comment	**Comment**: We ask that FORA consider opening the Parker Flats MRA as soon as field work is completed and dangers have been removed. Opening the site while paperwork is completed would reduce the time and burden of lost access and continue our present public uses more quickly. **Response**: FORA will work with the regulatory agencies with respect to the Marina Equestrian Association's request to gain access to the Parker Flats MRA as soon as possible following the completion of the fieldwork effort and regulatory documentation and approval.
b.	Specific Comment	**Comment:** Equestrian use should be added to paragraph 2.3.1 as a daily recreational user. **Response:** Equestrian use has been added to paragraph 2.3.1.
c.	Specific Comment	**Comment:** Equestrian use should be included in paragraphs 2.3.1 and 2.3.2 for past, current and future land use. **Response:** Equestrian use has been added to paragraphs 2.3.1 and 2.3.2 as past, current and future land users.
d.	Specific Comment	**Comment**: We wish to provide testimony that current recreational uses of the Parker Flats MRA are not conflicting and all should be accommodated after remediation. These daily recreational users are hikers, joggers, bikers, dog walkers and horse riders. **Response**: FORA will work with the regulatory agencies with respect to the Marina Equestrian Association's request to gain access to the Parker Flats MRA as soon as possible following the completion of the fieldwork effort and

Response to Comments
DRAFT Group 1 Remedial Investigation / Feasibility Study Work Plan, dated May 23, 2008
Review Comments provided by Marina Equestrian Association, dated September 24, 2008

No.	Comment Type / Report Section	Comment/Response
		regulatory documentation and approval. In addition, joggers, dog walkers and horse riders have been added to the list of daily recreational users in the Parker Flats MRA
e.	Specific Comment	**Comment**: We ask to have the Marina Equestrian Center acknowledged, where appropriate, as an historic and future source of users to this area due to its close proximity to Parker Flats and its unique connection to the National Park Service. **Response**: The Marina Equestrian Center will be referenced as a historic and future source of users to the area in the Remedial Investigation/Feasibility Study report to be prepared following the completion of the fieldwork efforts.

ESCA-0103
ESCA AR

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

July 09, 2008

Mr. Stan Cook
Fort Ord Reuse Authority
100 12th Street, Building 2880
Marina, CA 93933

Re: EPA comments on the Draft Group 1 Remedial Investigation/Feasibility Study Work Plan, Seaside Munitions Response Area and Parker Flats Munitions Response Area Phase II, dated May 23, 2008

Dear Stan:

Attached are EPA's comments on the *Draft Group 1 Remedial Investigation/Feasibility Study Work Plan, Seaside Munitions Response Area and Parker Flats Munitions Response Area Phase II*, dated May 23, 2008

If you have any questions, please do not hesitate to call me at (415) 972-3681 or e-mail me at huang.judy@epa.gov.

Sincerely,

Judy C. Huang, P.E.
Remedial Project Manager

cc:

Dan Ward (DTSC)
Site Mitigation/Office of Military Facilities
8800 Cal Center Drive
Sacramento, CA 95826

Roman Racca (DTSC)
Site Mitigation/Office of Military Facilities
8800 Cal Center Drive
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Kristie Reimer, AICP
Principal Planner
BRAC / Federal Programs
LFR Inc.
1900 Powell Street, 12th Floor
Emeryville, CA 94608

Ms. Gail Youngblood
Fort Ord Base Realignment and Closure Office
P.O. Box 5008
Monterey, CA 93944-5004

Mr. Thomas Hall (via E-mail)

REVIEW OF THE
DRAFT GROUP 1
REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN
SEASIDE MUNITIONS RESPONSE AREA
AND
PARKER FLATS MUNITIONS RESPONSE AREA
PHASE II
FORMER FORT ORD, CALIFORNIA
MAY 23, 2008

GENERAL COMMENTS

1. The Draft Group 1 Remedial Investigation/Feasibility Study Work Plan, Seaside Munitions Response Area and Parker Flats Munitions Response Area Phase II, dated May 23, 2008, (hereinafter referred to as the Dft GP 1 RI/FS WP, Seaside & Parker Flats MRAs, Phase II), presents the Quality Control (QC) process to be used during the execution of the RI/FS in a fragmented manner. It is understood that some of this fragmentation is due to the format of the document that is prescribed by the RI/FS requirements. However, there is no identifiable portion of the document or its appendices that contains a listing of all of the activities to be evaluated by QC, the evaluation criteria for each activity evaluated, and the associated pass/fail criteria. A listing of this information would be very valuable for use during the execution of the work plan and would assist those evaluating the quality of these processes in their efforts. Please provide a table/chart that provides this information in an appropriate location in the body of the Dft GP 1 RI/FS WP, Seaside & Parker Flats MRAs, Phase II.

2. The Dft GP 1 RI/FS WP, Seaside & Parker Flats MRAs, Phase II, refers to a number of teams throughout the document and its appendices. In most instances, the makeup of these teams is not provided. Some of the teams listed include: Excavation Team, UXO Team, UXO Intrusive Team, Brush Cutting Team, Geophysical Team, Chipper Team, Reacquisition Team, Dig Team, Field Team, Mechanical Vegetation Cutting Team, and ESCA RP Team. Some of these teams are defined by function and makeup in the document, but most are not. Please review the teams listed in the Dft GP 1 RI/FS WP, Seaside & Parker Flats MRAs, Phase II, and define the function and makeup of each team when first introduced in the text or at another appropriate location that may be referenced at the first introduction of the team in the text.

SPECIFIC COMMENTS

EXECUTIVE SUMMARY

1. **Sampling and Analysis Plan (Volume 2), Page xv:** The next-to-last sentence in the third paragraph of this section on page xv, in referring to the results of the surface sweep, states that, "If significant subsurface MEC (either high concentration or high risk unexploded ordnance) are discovered during the investigation, the immediate vicinity may be intrusively investigated to ascertain the limits of the condition." The use of the

word “may” in this sentence raises a concern as to the criteria that will make this further investigation obligatory. Please revise the cited section of the Executive Summary to state the specific criteria that will be used to determine whether the noted intrusive investigation will be initiated, or reference where this information may be found elsewhere in the document or its appendices.

VOLUME 1 – WORK PLAN

2. **Section 4.7, Explosives Safety Risk Assessment, Page 4-7:** The last sentence of the first paragraph of this section states that, “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 a MEC item combined with the potential of the item to cause a serious injury if detonated.” While many of the munitions items that may be found on the sites of concern can detonate, some are items that do not detonate, but burn or eject pyrotechnic cargoes that burn when they function. Based on this differing results of a munitions item functioning due to stimulus from a personal encounter, a better description of the results would be achieved if the words “it functions” replaced the word “detonated” in the cited sentence. Please make this correction here and elsewhere as appropriate in the Dft GP 1 RI/FS WP, Seaside & Parker Flats MRAs, Phase II.

3. **Appendix A, Seaside MRA Conceptual Site Model, Section 4.1.3, Historical Military Use, Page 4-2:** The last sentence in this section notes that, “It is expected that munitions activity associated with these ranges would have occurred within the firing points.” This statement may not be accurate, depending on the definition applied to the term “munitions activity.” Please revise this section to include a description of what constitutes “munitions activity,” or expand it to better explain the intent of the cited sentence.

4. **Appendix A, Seaside MRA Conceptual Site Model, Section 4.6, Seaside MRA Pathway Analysis, Page 4-11:** This section presents a general discussion of the potential exposure pathways from munitions items that may currently be present on the Seaside MRA. The results of this analysis are referenced as presented in Table 4.6-1, Seaside MRA – Potential Receptors and Exposure Media. The potential receptors listed include Construction Workers, Utility Workers, Trespassers, Firefighters, Emergency Response Workers, Ancillary Workers, Residents, and Recreational Users. The table divides these receptors into two categories, which are Current and Future. The Exposure Media listed is Ground Surface and Below Grade.

   None of the potential receptors are listed as being potentially exposed to MEC present on the ground surface, either in the Current or Future periods. Also, only the Construction Workers, Utility Workers, Firefighters, and Residents are identified as being potentially exposed to MEC present in the subsurface. The Trespassers, Emergency Response Workers, Ancillary Workers, and Recreational Users are listed as having no potential exposure to MEC present on the Ground Surface or in the Subsurface during either time period. No details as to how these determinations were made are provided in the cited section.

No MEC removal action short of complete excavation and removal (or screening) of the soil to the potential penetration depths of the munitions used will provide a complete assurance that no MEC remains on the site so treated. Based on this fact, the presence of MEC on and beneath the surface of the Seaside MRA cannot be ruled out, both before and after surface and subsurface removals have been conducted. Therefore, any person entering the site has the potential to contact MEC on the surface, and any person conducting any intrusive activity on the site has the potential to contact subsurface MEC, both prior to and after the removal actions have been completed.

Please review the cited section and table and revise them as necessary to present the correct exposure potential for the listed receptors.

5. **Appendix A, Seaside MRA Conceptual Site Model, Table 4.1-4, Seaside MRA – Historical Military Use, Page 4-17:** In the row entitled "Range 23M," the second bullet in the Description column lists "Dragon rounds" as having been found on this range. As "Dragon rounds" would be an unfired missile, this is highly unlikely. Please review the cited table and correct it as necessary.

6. **Appendix A, Seaside MRA Conceptual Site Model, Figure 4.6-1, Seaside MRA Pathway Analysis Flowchart:** In the column entitled "Expected MEC Contamination," some of the boxes in the column list "MD" as a possible component. As MD is not a subcomponent of MEC, this is technically an incorrect usage. Either the column heading should be revised to replace the term "MEC" or the MD should be removed from the noted boxes in the column. Please correct this as needed.

   In addition, the column entitled 'Secondary Sources" lists both Ground Surface and Below Grade as the initial media contaminated by MEC. However, the Ground Surface source is not continued to completion on the flowchart, as is the case with the Below Grade category. Please complete the evaluation of this source in the flowchart.

7. **Appendix B, Parker Flats MRA Conceptual Site Model, Section 5.6, Parker Flats MRA Pathway Analysis, Page 5-10:** This section presents a general discussion of the potential exposure pathways from munitions items that may currently be present on the Parker Flats MRA. The results of this analysis are referenced as presented in Table 5.6-1, Parker Flats MRA – Potential Receptors and Exposure Media. The potential receptors listed include Construction Workers, Utility Workers, Trespassers, Firefighters, Emergency Response Workers, Ancillary Workers, Residents, and Recreational Users. The table divides these receptors into two categories, which are Current and Future. The Exposure Media listed is Ground Surface and Below Grade.

With the exception of Emergency Response Workers and Residents, all of the potential receptors are listed as being potentially exposed to MEC present on the ground surface, either in the Current or Future periods. An exception is the Recreational User, who is not listed for the Current period. Also, the Trespassers, Emergency Response Workers, Ancillary Workers, and Recreational Users are identified as not being potentially exposed to MEC present in the subsurface. Only the Emergency Response Workers are listed as having no potential exposure to MEC present on the Ground Surface or in the Subsurface during either time period. No details as to how these determinations were made are provided in the cited section.

As has previously been noted, no MEC removal action short of complete excavation and removal (or screening) of the soil to the potential penetration depths of the munitions used will provide a complete assurance that no MEC remains on the site so treated. Based on this fact, the presence of MEC on and beneath the surface of the Seaside MRA cannot be ruled out, both before and after surface and subsurface removals have been conducted. Therefore, any person entering the site has the potential to contact MEC on the surface, and any person conducting any intrusive activity on the site has the potential to contact subsurface MEC, both prior to and after the removal actions have been completed.

Please review the cited section and table and revise them as necessary to present the correct exposure potential for the listed receptors.

8. **Appendix B, Parker Flats MRA Conceptual Site Model, Table 5.3-2, Parker Flats MRA Phase II – Removal Activities, Page 5-22:** In the row entitled "MRS-15MOCO.2," the fourth bullet in the Summary column has a sentence that states, "This operation identified areas [or an area? areas is correct] of obstructions/interferences such as asphalt, and material from the Range 45 pad, or telephone poles as SCA (Parsons 2004b)." Either this sentence is very poorly constructed or editorial comments have not been expunged from the table. Please review this table and correct it as necessary.

9. **Appendix B, Parker Flats MRA Conceptual Site Model, Figure 5.6-1, Parker Flats MRA Pathway Analysis Flowchart:** In the column entitled "Expected MEC Contamination," the box in the column list "MD" as a possible component. As MD is not a subcomponent of MEC, this is technically an incorrect usage. Either the column heading should be revised to replace the term "MEC" or the MD should be removed from the noted box in the column. Please correct this as needed.

   In addition, the column entitled "Secondary Sources" only lists Below Grade as the initial media contaminated by MEC. However, the Ground Surface source is discussed in Section 5.6.1, Exposure Pathways, and is also referenced in Table 5.6-1, Parker Flats MRA – Potential Receptors and Exposure Media. Please provide an evaluation of this source in the flowchart.

VOLUME 2 – SAMPLING AND ANALYSIS PLAN

10. **Section 2.2.1, Parker Flats MRA-Phase II Remedial Investigation, Page 2-2:** The last sentence in the third paragraph of this section, in referring to the results of the surface sweep, states that, "If significant subsurface MEC (either high concentration or high risk unexploded ordnance [UXO]) are discovered during the investigation, the immediate vicinity may be intrusively investigated to ascertain the limits of the condition." The use of the word "may" in this sentence raises a concern as to the criteria that will make this further investigation obligatory. Please revise the cited section to state the specific criteria that will be used to determine whether the noted intrusive investigation will be initiated, or reference where this information may be found elsewhere in the document or its appendices.

11. **Section 2.3.5.1, Excavation of Digitally Reacquired Anomalies, Page 2-9:** The last sentence in this section states, "If MEC are encountered that are suspected of containing unknown filler, MEC extinction will be conducted in accordance with the SOP for MEC with Unknown Filler presented in Appendix D of this G1SAP." Please explain the reason for the use of the word "extinction" in this sentence and what it entails.

12. **Section 5.25, Geophysical QC Surveys, Page 5-19:** In the three sub-elements (QC-1, QC-2, and QC-3) of the first paragraph of the section, the basic concepts of these three QC steps are identified. However, no specific resurvey percentage (or reference as to where this may be found elsewhere in the document or its appendices) is provided for QC-2 and QC-3. Please provide the percentages to be resurveyed, a discussion of how they will be determined, or a reference as to where these may be found elsewhere in the Dft GP 1 RI/FS WP, Seaside & Parker Flats MRAs, Phase II, or its appendices.

13. **Appendix B, Parker Flats MRA Phase II – Types of MEC Removed and Hazard Classification, Page B-2:** The table lists an item as follows: "High explosive, 40mm (model unknown)." It is unclear as to whether this is a cartridge or a projectile. Please revise the entry to provide this information, if available.

DEPARTMENT OF THE ARMY
FORT ORD OFFICE, ARMY BASE REALIGNMENT AND CLOSURE
P.O. BOX 5008, BUILDING #4463 GIGLING ROAD
MONTEREY, CALIFORNIA 93944-5008

REPLY TO
ATTENTION OF

JUN 3 0 2008

Base Realignment and Closure

Stan Cook
ESCA Remediation Program Manager
Fort Ord Reuse Authority
100 12th Street
Marina, CA 93933

Subject: *Draft Group 1 Remedial Investigation/Feasibility Study (RI/FS) Work Plan, Volume 1-Work Plan* and *Volume 2-Sampling and Analysis Plan*, dated May 23, 2008, received on May 29, 2008.

Dear Mr. Cook:

Thank you for an opportunity to review and comment on the subject document. The Army's comments are enclosed. Please note our comments are focused on "big picture" issues such as the consistency with documents previously produced under the Army's cleanup program. A copy of this letter will be furnished to U.S. Environmental Protection Agency (Judy Huang) and California Department of Toxic Substances Control (Roman Racca).

Sincerely,

GYoungblood

Gail Youngblood
BRAC Environmental Coordinator
Fort Ord Field Office

Enclosure

DRAFT Group 1 Remedial Investigation/Feasibility Study (RI/FS) Work Plan, Seaside Munitions Response Area (MRA) and Parker Flats MRA Phase II, Volume 1

Army Comments:

1. P.1-3, Section 1.3.1, last paragraph. The last sentence should be revised to clarify that the consultations resulted in biological opinions (BOs) that allow impacts to and incidental take of listed species during MEC remedial activities but require mitigation measures to be implemented during the munitions response activities to reduce and minimize impacts to the protected species and their habitats.

2. p.2-5, Section 2.3.2 Future Land Use. In addition to the 1997 Fort Ord Base Reuse Plan, the 2002 *Assessment East Garrison – Parker Flats Land Use Modifications* is applicable and should be introduced in this section.

3. p.3-1, Section 3.2 Parker Flats MRA Phase II Evaluation. There is a 1.1-acre portion of MRS-13B that overlaps parcel E19a.2. This area was called "MRS-13B Habitat Reserve" in the Final Track 2 Munitions Response RI/FS for the Parker Flats MRA (Phase I). No MEC item was recovered from the MRS-13B Habitat Reserve during the subsurface MEC removal that was previously conducted. Remedial investigation and risk assessment for this area are complete and documented in the final Track 2 RI/FS report. However, as described in the feasibility study (FS), Section 2.1.1 Assessment of Reuse Areas for FS Analysis, this area was not included in the FS (therefore the subsequent Proposed Plan) due to its small size. A decision was made that an evaluation of remedial alternatives (if response is required) for the MRS-13B Habitat Reserve should be conducted when the rest of the habitat reserve property (E19a.2) is evaluated in an RI/FS and ROD. Please reflect this information and include the MRS-13B Habitat Reserve Reuse Area in the Group 1 FS.

4. p.4-5, Section 4.4 RQA Pilot Study. Please state whether this pilot study is intended to satisfy the requirement of the ESCA for a RQA pilot study.

5. p.4-6, Section 4.5.2 Parker Flats MRA Phase II. To reduce potential confusion, please clarify that "non-residential" means non-residential development, and does not include habitat reserve. Please also consider "habitat reserve" as a land use category name since "habitat reserve" was used in Volume 2, Section 2.1 and Figure A-1.

6. p.4-7, Section 4.5.2 Parker Flats MRA Phase II, last paragraph. This section describes that the surface sweep will involve investigation of shallow anomalies within 3 inches. Please describe if deeper anomalies that are not completely investigated will be documented. Same comment applies to Volume 2, p.2-2, Section 2.2.1.

7. p.4-11, Section 4.10 Community Relations. First paragraph. The Community Involvement and Outreach Program (CIOP) Plan does not amend the Fort Ord Community Relations Plan; however, it is an enhancement to this existing plan. Please revise the sentence as follows: "The CIOP Plan is an addendum to the Army's former Fort Ord Community Relations Plan." Please also see the Army's comments to similar text that appeared in Draft CIOP Plan.

8. p.4-12, Section 4.10.3.

a. Bullet 1. It is indicated "all CSUMB faculty, staff, and students residing in campus housing will receive a copy of the newsletter while school is in session." should be re-evaluated. Suggestion to instead describe the actions that FORA and/or the ESCA RP Team will take to reach out to the CSUMB.
b. Bullet 1. It is indicated that the FORA newsletters will be posted on the Army's Fort Ord cleanup website. It would be more accurate to state that FORA newsletters that are posted on FORA's website are available by hyperlink to FORA's website from www.fortordcleanup.com/community/factsheets.asp.
c. Bullet 5. It is indicated that FORA factsheets will be included into the Information Repositories. Information Repositories are maintained by the Army and typically does not include factsheets. Please revise the text to the effect.
d. Bullet 8. The text as written can be mis-interpreted as suggesting that FORA and/or the ESCA RP Team is maintaining the Fort Ord Administrative Record and the Information Repositories. Please revise the text to the effect that FORA and/or the ESCA RP Team will submit RI-related documents to the Army for inclusion in the Administrative Record.

9. p.5-1. Section 5.2 Task 2 Community Relations. The last two sentences indicate that the Army's previous versions of Community Relations Plans (CRPs) have been superseded by the current CIOP Plan and the CRP Update Number 3. To clarify, please revise the text to read "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."

10. p.5-2, Section 5.5 Task 5 Data Evaluation. This section indicates that the results of this task will be presented to stakeholders prior to proceeding to the risk assessment. Please describe how this coordination will be accomplished.

11. p.5-2, Section 5.6 Task 6 Risk Assessment. This section indicates that the results of this task will be presented to stakeholders prior to proceeding to the development of alternatives. Please describe how this coordination will be accomplished.

12. Table 1 Potential Applicable or Relevant and Appropriate Requirements (ARARs). Please review the "remarks" column so that they address the planned/anticipated CERCLA actions for the Group 1 MRAs.

13. Please include an acknowledgement of sponsorship pursuant to ESCA Section D.11.

14. Please coordinate any outreach activities targeting the Department of Defense (DoD) communities that may be affected by the planned field investigation (Fitch and Marshall housing areas, DoD Center) and associated possible road closures with the BRAC Fort Ord Field Office. Our Point of Contact for this matter is Melissa Broadston at 831-393-1284.

Detail/minor comments:

15. p.1-1, Section 1.0. First paragraph. Please replace the phrase "ordnance and explosives" with the more recent term "military munitions."

16. p.1-2, Section 1.3.1. Please see the Army's comments to similar text that appeared in Draft Summary of Existing Data Report (SEDR), Section 2.2.

DRAFT Group 1 Remedial Investigation/Feasibility Study (RI/FS) Work Plan, Seaside Munitions Response Area (MRA) and Parker Flats MRA Phase II, Volume 2

Army Comments:

17. p.2-2, Section 2.2.1 Parker Flats MRA Phase II Remedial Investigation. This section discusses that the investigation of residential and non-residential development areas will entail 100% digital geophysical investigation to the depth of detection. While the plan for structure removal was clarified in Appendix C: Building Demolition and Removal Plan, it is not clear how paved areas such as roads will be handled during the investigation. Please provide additional text to clarify.

18. p.2-8, Section 2.3.5.1 Excavation of Digitally Reacquired Anomalies. Fourth paragraph discusses inspecting discovered MEC items to confirm that it is MEC, MD or other scrap, and that MD and scrap will be transported offsite for disposal or recycling. Please also discuss whether MD will be inspected and certified free of explosives hazard before it is shipped offsite.

19. p.5-21, Section 5.25 Geophysical QC Surveys, QC-2 Geophysical Resurveying. The second paragraph discusses failure criteria of a discovery of an MEC or MEC-like item, or five re-acquirable anomalies. Please clarify whether this QC criteria is applied to each 100' x 100' grid, or to the entire footprint of geophysical investigation.

20. Section 7.0 Location Surveys and Mapping Plan. It is our understanding that the ESCA RP Team is in the process of developing a procedure for migrating the munitions response data into the Army's MMRP database, and that you have been coordinating this effort with our MMRP database manager. Please include this procedure into the final version of the Group 1 RI/FS Work Plan to ensure that necessary data is collected throughout the project and available for submission at the end of the project.

21. Please include a procedure for handling a situation in which possible Army obligations, as defined in the ESCA, are discovered during the remedial investigation.

22. p.12-5, Section 12.3.2.3.
    a. Paragraph #2. The statement that excavated areas will be allowed to revegetate naturally applies to typical mag and dig operations. However, if excavations are larger and disturb more than approximately 200 square feet, then passive or active restoration with follow-up monitoring may be necessary. This will be evaluated on a case-by-case basis.
    b. Last paragraph. The paragraph states that restoration monitoring will occur in accordance with Chapter 4 of the HMP. However, the requirement to monitor vegetation in Habitat Reserve areas is described in Chapter 3 of the HMP.

23. Appendix D: Standard Operating Procedures. Standard Operating Procedure for MEC with Unknown Filler. Section 5.1 General. Bullet 7 indicates that the standard reporting procedure is for FORA to contact the Presidio of Monterey Police Department (POMPD) who will notify the Technical Escort Unit (TEU). After the property is transferred to FORA, the standard procedure for such notification should be from FORA to local law enforcement agency to the EOD unit assigned to the region. If the EOD unit determines that a response by TEU is needed, it would complete such notification. In addition, FORA should notify the POMPD and the BRAC Fort Ord Field Office when it notifies the local law enforcement agency.

24. Appendix F: Residential Quality Assurance Pilot Study Work Plan. Section F-2.1 RQA Pilot Study Test Areas. It is our understanding that the test area RQA-2 contains a portion that may not be developed for residential use (a portion of Parcel E18.1.1, a part of the veterans cemetery project). Please re-assess the suitability of this site for RQA pilot study implementation given the uncertainty in the future use.

25. Appendix F: Residential Quality Assurance Pilot Study Work Plan. The Army will provide additional review comments on the Residential Quality Assurance Pilot Study Work Plan after regulatory agencies provide their inputs.

Detail/minor comments:

26. Table 5-1, Recovery and Penetration Depths of MEC Previously Encountered in Parker Flats MRA Phase II. One of the footnotes describes MRA as "Munitions Response Site." Please correct this to "Munitions Response Area."

27. Appendix B: MEC Data. The Hazard Classification table describes hazard classification 0 as "Inert MEC that will cause no injury." By definition MEC is explosive in nature, therefore category 0 or "inert" classification is not possible for a MEC item. Classification 0 should be described as "inert munitions item that will cause no injury" instead.

28. Appendix F: Residential Quality Assurance Pilot Study Work Plan. Figure F-2. The legend describes hazard classification 0 as "Inert MEC that will cause no injury." By definition MEC is explosive in nature, therefore "inert" classification is not possible for a MEC item. Classification 0 should be described as "inert munitions item that will cause no injury" instead.

29. Appendix I: Explosives Siting Plan. Section 1.6.1 Detonation Site Blow-In Place. The second to the last bullet discusses that after property transfer, fire risk assessment for planned detonations will be conducted by the City of Seaside Fire Department. Please verify if this is the case since the majority of the investigation area is within the jurisdiction of the Monterey County.

30. Appendix J: Site Safety and Health Plan. Section J-12.4 Offsite Emergency Response Services. Table J-6 Emergency Contacts lists City of Seaside police and fire agencies. Please verify whether Monterey County law enforcement and fire agencies need to be identified, since the majority of the investigation area is within the jurisdiction of the Monterey County.

5C
LB

Marina Equestrian Association
P.O. Box 1320
Marina CA 93933

RECEIVED
OCT - 6 2008
FORA

Marina Equestrian Association

24 September 2008

FORA
Attn: Mr. Stan Cook
100 12th Street
Building 2880
Marina, CA 93933

Ref: Requests relating to Remediation Program for Parker Flats MRA (Group 1)

Dear Mr. Cook

The Marina Equestrian Association (MEA), which operates the Marina Equestrian Center (MEC), would like to address aspects of the FORA / ESCA Remediation Program contained in the Draft of "Group 1, Remedial Investigation / Feasibility Study Work Plan" relating to The Parker Flats Munitions Response Area. Certain aspects of this plan impact the operation of our organization, the facility we run and visitor-users of our site.

We fully support remediation of these areas. However, as a public access equestrian facility, the MEC needs to be supported in having safe access to the BLM during this time of fieldwork and in gaining access to the Parker Flats area as soon as possible to continue our recreational and public access use of those areas.

Our specific comments for FORA's consideration are:

a. We ask that FORA consider opening the Parker Flats MRA as soon as field work is completed and dangers have been removed. Opening the site while paperwork is completed would reduce the time and burden of lost access and continue our present public uses more quickly.
b. Equestrian use should be added to paragraph 2.3.1 as a daily recreational user.
c. Equestrian use should be included, in paragraphs 2.3.1 and 2.3.2. for past, current and future land use
d. We wish to provide testimony that current recreational uses of the Parker Flats MRA are not conflicting and all should be accommodated after remediation. These daily recreational users are hikers, joggers, bikers, dog walkers and horse riders.
e. We ask to have the Marina Equestrian Center acknowledged, where appropriate, as an historic and future source of users to this area due to its close proximity to Parker Flats and its unique connection to the National Park Service.

Background and the specific impact of this closure on our operations are detailed in the following pages. Our suggestions are also detailed there. Lynne Gose, at 831-883-8644 or jrgose@comcast.net, is our point of contact on this issue.

We appreciate the care with which the public is kept informed of FORA and ESCA activities in the former Fort Ord lands and the opportunity to provide input in these important processes.

Sincerely,

The 2008 MEA Board of Directors

1. Introduction

The Marina Equestrian Association (MEA) would like to address aspects of the FORA ESCA Remediation Program contained in the Draft of "Group 1, Remedial Investigation / Feasibility Study Work Plan" relating to Parker Flats Munitions Response Area. Certain aspects of this plan impact the operation of our organization, the facility we run and visitor/users of our facility.

2. Background and History

The Marina Equestrian Association operates the 15 acre Marina Equestrian Center (MEC) at the corner of 5th Street and 9th Avenue in Marina. Equestrian activities have operated in this portion of Fort Ord since about 1905 when the first US Army cavalry units occupied this site and used what is now FORA and BLM land for maneuvers. The renowned 11th Cavalry "Blackhorse" unit was the last military unit to occupy the site before the cavalry was disbanded in 1965. Many of the trails we ride today are those created and traveled by cavalry troupers throughout the last century.

In 1965 the military stables was given a recreational use. Military and civil service employees assigned to Military stations on the Monterey Peninsula created a cooperative organization to run the site as a riding club for military family recreation. Trail use continued with this organization. With the closure of Fort Ord in the 1990s, the survival of the facility was in doubt.

Faced with the loss of their Army sponsor for the land, and the potential loss of the facility for use by military families assigned to the Monterey peninsula, the Marina Equestrian Association (MEA) was founded as a non profit organization to explore the possibility of preserving the facility for public use. MEA approached the City of Marina in April of 1994 to sponsor their application to continue the equestrian activity on the (then) 34 acre property.

At the urging of citizens of the community, The City of Marina requested, under the Federal Lands to Parks Program and FORA, to keep the stables open to provide public recreation and take advantage of the extensive trail systems. The land was transferred to The City of Marina as an Equestrian Center with oversight by the National Parks Service. MEA operated the facility and provided boarding of horses and other programs to citizens of Marina and the Monterey Peninsula.

MEA has operated a successful stable for horse-owning members of the community willing to provide their own labor and skills to offset the normal payroll and commercial costs of operating a stable. This creates a unique recreational opportunity for working-class families to experience horse ownership and make use of easy access to the extensive Fort Ord and BLM Trails.

Over time, MEA provided a variety of public access programs in the community. Most recently, MEA has offered riding lessons, quarterly Kids Days, a community open house, BLM orientation rides for area trailriders, the Marina School Break Riding Camp Programs. Always, the center is available for visits, as a picnic site, for arena rental, for travelers visiting the area with horses (a hotel for horses), riding lessons, or for safe access to BLM trails for area horse owners. CSUMB students also volunteer for public service, ride, or board horses at the MEC.

The Center is active as an emergency evacuation site for livestock and members are registered with local rescue missions to assist with transportation of horses from endangered locations during fire season or other disasters. During the 2008 fire season, the Center hosted eight horses evacuated from Big Sur fire, at no cost to their owners. Members also participate in the Monterey Bay Bicycle and Equestrian Assistance Team (BETA) to provide visitor assistance, emergency response and patrol on the trails of the BLM and MEA participates monthly in the FORA User's Working Group. Other MEC riders provide a service to the governing jurisdictions of FORA and BLM public lands by reporting dangers, illegal use and trail assistance while riding these areas.

3. Location of the Equestrian Center

The center is located less than one mile from the Northwest corner of the CSUMB Off-Campus and County North areas (see map at Figure 1). By our system of trails we are about 3 miles from the access point to the BLM, where it is bordered by Watkins Gate Road or 2 miles from the Gigling Road access at 8th Street and Gigling Road. Our members, visitors and users, if not riding through the CSUMB Off-Campus area, often park at the 8th and Gigling Road parking area access the Parker Flats area.

4. Land Use by MEA (ref paras 2.3.1 and 2.3.2)

Our organization and its membership is the latest in a long line of equestrian, hiker and dog-walking users of the Parker Flats MRA. Before our current day, users were the many military families and the cavalry troupers who used this extensive network of trails. Although members occasionally hike, bike and dog-walk the area, our primary concern for this request is the use of these trails by horseback. These undeveloped areas have soft footing and perfect trails for horses and their use has been passed down among riders for decades. Our members and guests use these areas DAILY for equestrian recreation and to gain access to the adjacent and more extensive BLM lands.

MEA provides public access and a safe trailhead for equestrian users of the Western portion of the Fort Ord BLM. Over the decades, area and regional riders bought their horses to our facility which provided a safe and secure environment to unload horses and a location which could provide restroom facilities and running water for watering and bathing horses after a long ride. Most riders explore the BLM, CSUMB Off-Campus and North County, and Parker Flats trail areas with rides of 2-6 hour durations.

5. General Comments

In MEA's experience, all current users (bike riders, dog walkers, hikers and equestrians) get along well, are courteous and safety minded when on the trail. In our view, these are all compatible activities. All groups are mutually supportive of use of trails by other user groups and support sharing this recreational resource.

MEA fully supports munitions cleanup and has worked to educate our membership and visiting riders of the importance of this remediation. We have worked diligently with the FORA user's Group to stay abreast of the remediation plans and requirements and to educate other users with whom we have contact. This summer we hosted two equestrian trailride events informing area riders of the impending CSUMB Off-Campus, North County and Parker Flats trail closures, and oriented them with the authorized access corridors to the BLM. We also provide modified maps to the trail riding public showing the new access corridors and optional parking areas.

However, as a public access facility, the MEC needs to be supported in having SAFE access to the BLM during this time of fieldwork and in gaining access to the Parker Flats area as soon as possible to continue our recreational and public access use of those areas.

6. Impact of closures on MEC's public access use and outreach

Closure for longer than apbsolutely necessary to make the area safe sevearly limits our ability to perform our BLM access and public equestrian recreation missions. For the past year, MEA has been negotiating with a concessionaire to provide trail rides onto public lands to members of the public who do not own their own horses. This was a use of our facility and equestrian trails were envisioned and mapped out in early FORA planning. Delays of longer than absolutely necessary after fieldwork and remediation are complete will significantly impact the economics of public trail rides and the viability of this and other public access programs.

Closure to public use of this highly desirable Parker Flats area is a frustration to regular users and severely undercuts the access to public recreation our organization provides. Delays not required by safety could even threaten the very existence of the Marina Equestrian Center if public use declines while trails are closed or as equestrian access route become viewed as abandoned. In these times when land has become so valuable, there is enormous pressure on the MEC continue public access activities or face the possibility the City of Marina can justify other uses for the equestrian site.

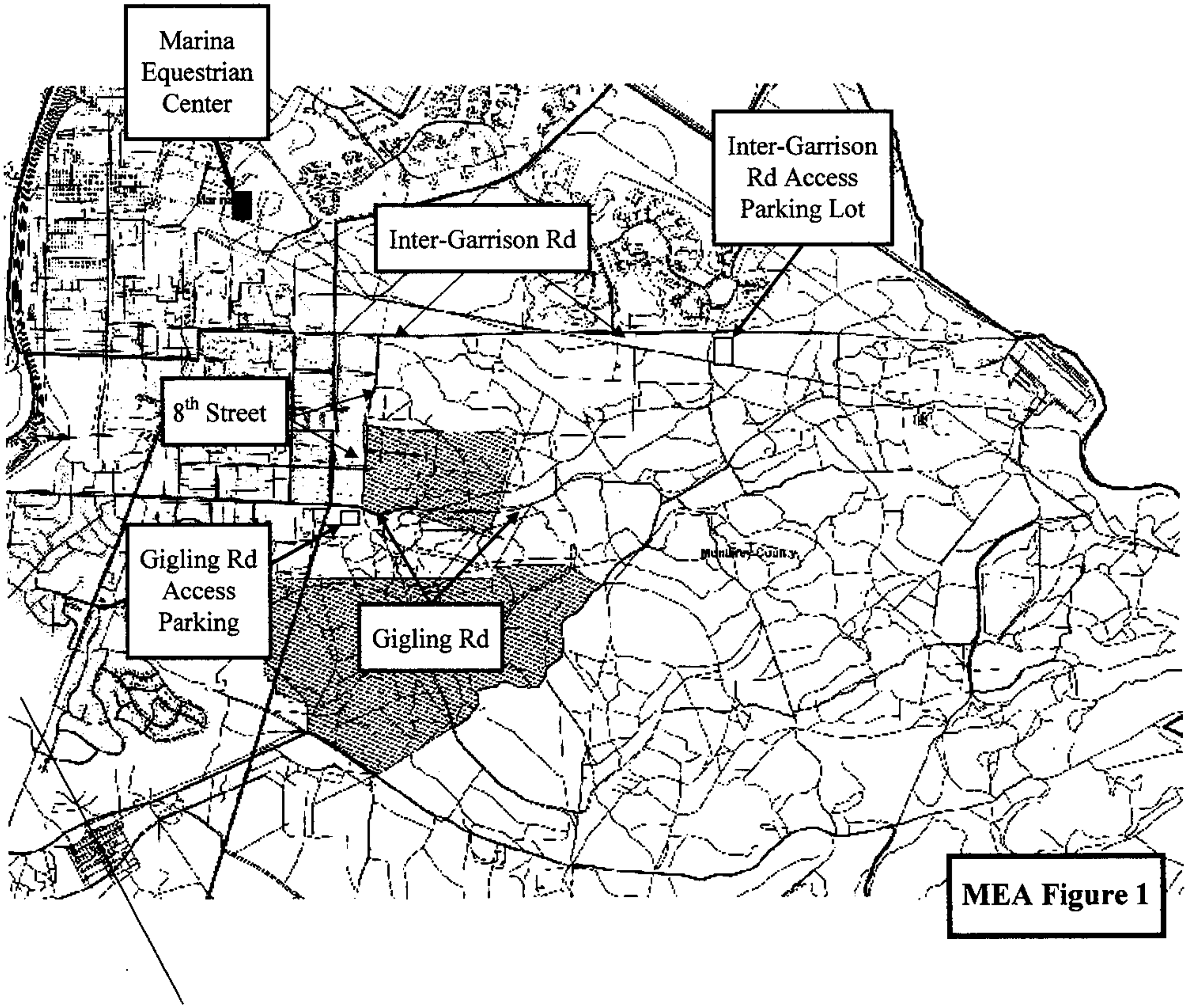
7. Suggested alternatives to elevate this public access problem

For these reasons we ask that the Parker Flats MRA be opened as soon as field work has been completed and the dangers have been removed. Delays to process paperwork could threaten critical public access programs and there-by the very existence of the Equestrian Center. We have been told that paperwork for site closure can take one-and-a-half to two years to complete once field work has been completed. These extra years with no access are an unnecessary burden in the users of these areas, particularly when there has been a long history of uneventful use. It would be a particularly galling burden to be excluded from using these areas while paperwork is processed after they have been made safe.

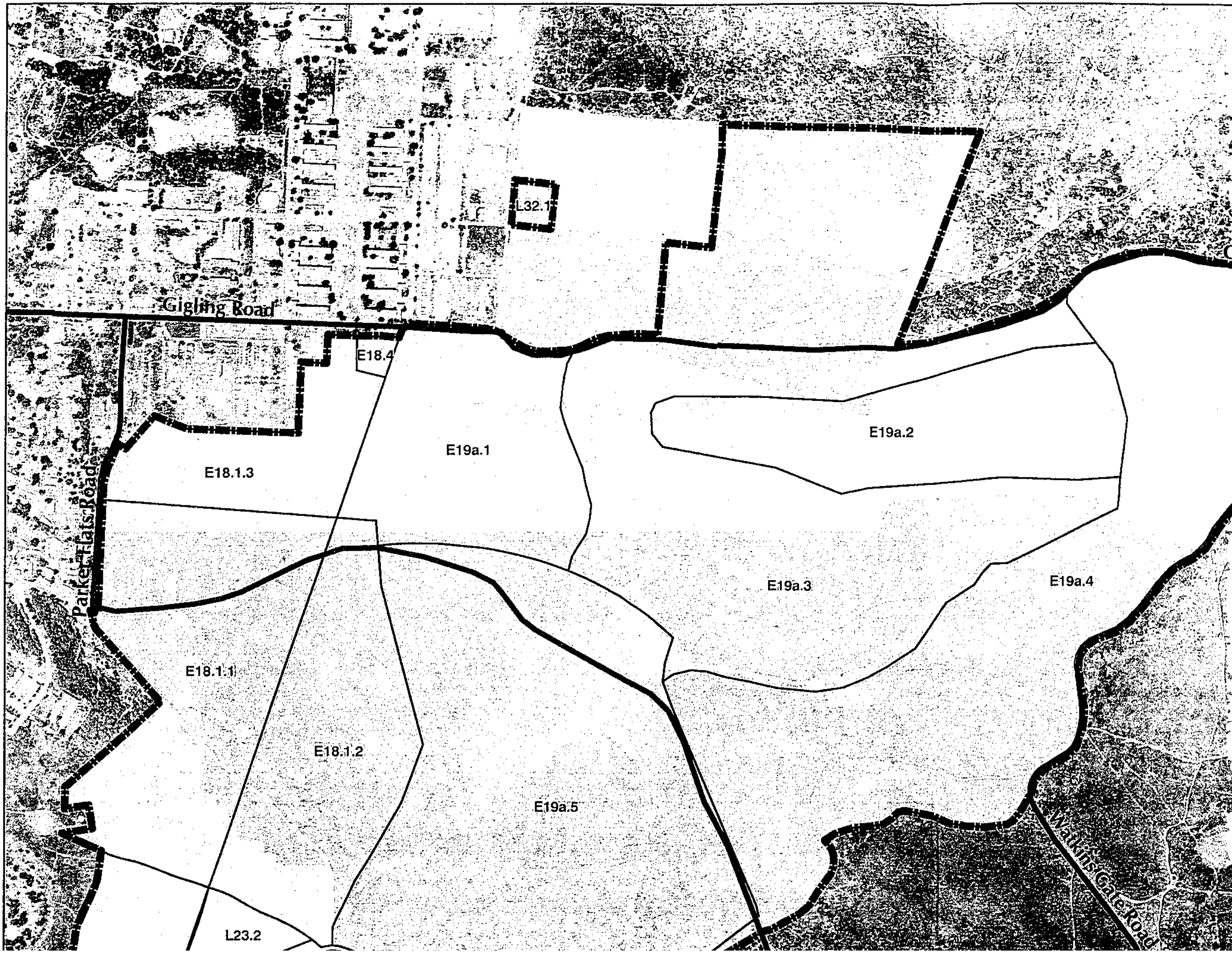
By opening the Parker Flats area following field work and munitions removal, there will be an area for public trailriding convenient to the Gigling Road parking lot available while the CSUMB Off-Campus and North County areas are still undergoing field work. Accessing the BLM in a safer and more aesthetically pleasing way for those using Gigling Road trailer parking access would be available months or years earlier. Riding through the Parker Flats area to reach the BLM would avoid a long walk on Gigling Road pavement to reach the BLM entrance. Equestrian users of the MEC and public trail riders will also be able to enjoy closer and more varied recreational alternatives much sooner.

8. In summary, our specific comments for FORA's consideration are:

a. We ask that FORA consider opening the Parker Flats MRA as soon as field work is completed and dangers have been removed. Opening the site while paperwork is completed would reduce the time and burden of lost access and continue our present public access and equestrian recreation missions more quickly. It would benefit other users as well.
b. Equestrian use should be added to paragraph 2.3.1 as a daily recreational user.
c. Equestrian use should be included, in paragraphs 2.3.1 and 2.3.2. for past, current and future land use
d. We wish to provide testimony that current recreational uses of the Parker Flats MRA are not conflicting and all should be accommodated after remediation. These daily recreational users are hikers, joggers, bikers, dog walkers and horse riders.
e. We ask to have the Marina Equestrian Center be acknowledged, where appropriate, as an historic and future source of users to this area due to its close proximity to Parker Flats and its unique connection to the National Park Service.


Marina Equestrian Center
Inter-Garrison Rd
Inter-Garrison Rd Access Parking Lot
8th Street
Gigling Rd Access Parking
Gigling Rd
Monterey County

MEA Figure 1



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APPENDIX L

Distribution List

Document Distribution List

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1	1	Stan Cook	Fort Ord Reuse Authority	100 12th Street, Bldg. 2880	Marina, CA	93933
1	1	Michael Houlemard	Fort Ord Reuse Authority	100 12th Street, Bldg. 2880	Marina, CA	93933
1	1	Judy Huang	U.S. Environmental Protection Agency	75 Hawthorne Street, Mail SFD-8-3	San Francisco, CA	94105
1	1	Tom Hall	TechLaw, Inc.	7 Shore Point Road	North Little Rock, AR	72116
1	1	Roman Racca	California Department of Toxic Substances Control	8800 California Center Drive	Sacramento, CA	95826
1	1	James Austreng	California Department of Toxic Substances Control	8800 California Center Drive	Sacramento, CA	95826
2	2	Gail Youngblood	Department of the Army	BRAC, Bldg. #4463 Gigling Road	Monterey, CA	93940
1	1	Sandy Reese	MACTEC	Administrative Record BRAC, Bldg. #4463 Gigling Road	Monterey, CA	93940
1	1	Peter deFur	TAG Consultant	1108 Westbriar Drive; Suite F	Richmond, VA	23238
1	1	LeVonne Stone	Executive Director, Environmental Justice Network	P.O. Box 361	Marina, CA	93933
1	1	Mike Weaver	Fort Ord Community Advisory Group	52 Corral de Tierra Road	Salinas, CA	93908
1	1	Richard Bailey	Fort Ord Community Advisory Group	440 Ramona Avenue, Apt 16	Monterey, CA	93940
1	1	Linda Millerick	Save Our Air Resources (SOAR)	751 Montery - Salinas Highway	Salinas, CA	93908
1	1	Nick Nichols	Monterey County, Resources Management Agency Office of Housing & Redevelopment	168 West Alisal Street, Third Floor	Salinas, CA	93901
1	1	Project File	LFR Inc. Attention: Jennifer Johnson	1900 Powell Street, 12th Floor	Emeryville, CA	94608
1	1	Project Library	LFR / Weston Project Office	100 12th Street, Bldg. 2903	Marina, CA	93933

Approved: [signature]

Kristie Reimer
ESCA Remediation Program Manager
LFR Inc.