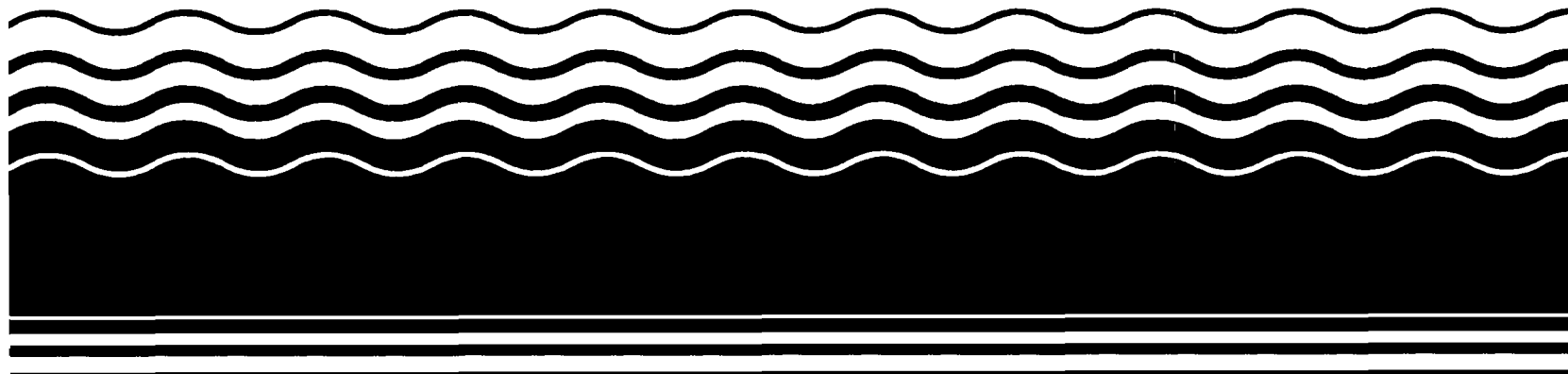


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EPA/541/R-97/033
November 1997**

**EPA Superfund
Record of Decision:**

**Fort Ord (Basewide Remedial Investigation Sites)
Marina, CA
1/17/1997**



**Record of Decision
Basewide Remedial Investigation Sites
Fort Ord, California**

January 13, 1997

United States Department of the Army
HQ, U.S. Army Garrison (Fort Ord)
Fort Ord, California 93941

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1.0 DECLARATION

1.1 Site Name and Location

Fort Ord is located near Monterey Bay in northwestern Monterey County, California, approximately 80 miles south of San Francisco. The base comprises approximately 28,000 acres adjacent to the cities of Seaside, Sand City, Monterey, and Del Rey Oaks to the south and Marina to the north. The Southern Pacific Railroad and Highway 1 pass through the western portion of Fort Ord, separating the beach front from the rest of the base. Laguna Seca Recreation Area and Toro Regional Park border Fort Ord to the south and southeast, respectively. Land use east of Fort Ord is primarily agricultural.

1.2 Basis and Purpose

This Record of Decision (ROD) addresses the following sites investigated under the Basewide Remedial Investigation/Feasibility Study (RI/FS) Program at Fort Ord: Remedial Investigation (RI) Sites 2 and 12, 16 and 17, 31, and 39 (Plate 1); surface water outfalls OF-1 through -14, OF-16 through -30, OF-32 and -33; and two additional sites, Sites 25 and 33. Surface water outfalls OF-15, -34, and -35 are not addressed in this ROD, but are addressed separately in the Interim Action (IA) ROD (HLA, 1994a). This ROD does not address issues pertaining to Site 3 (Beach Trainfire Ranges), Monterey Bay, or ordnance and explosives (OE). A separate ROD for Site 3, the Beach Trainfire Ranges, is being prepared because ecological risks at Site 3 are still being evaluated. OE at Fort Ord will be addressed in a separate process.

This decision document presents the selected remedial actions for soil and groundwater at the RI and other sites. The remedies were selected in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendment and Reauthorization Act (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the Administrative Record for Fort Ord.

The United States Environmental Protection Agency (EPA) and the California Environmental Protection Agency (Cal/EPA), which includes the

California Regional Water Quality Control Board - Central Coast Region (RWQCB) and other State agencies, concur with the Army's selected remedies.

1.3 Site Assessment

Actual or threatened releases of hazardous substances at the RI and other sites, if not addressed by implementing the response actions selected in this ROD, may present a current or future threat to public health, welfare, or the environment.

1.4 Description of the Remedies

The selected remedial alternatives described in this ROD address current or potential significant risks to human health and the environment posed by Sites 2 and 12, 16 and 17, 31, 39; surface water outfalls OF-1 through -14, -16 through -30, OF-32, and -33; and Sites 25 and 33 at Fort Ord, California as described in the Basewide Remedial Investigation/Feasibility Study (RI/FS) (HLA, 1995a). Chemicals of potential concern (COPCs) and their respective cleanup levels in soil and groundwater at the RI sites are summarized in Table 1.

The existing boundaries of the main landfill area at the Operable Unit 2 (OU 2) landfill will be designated as a Corrective Action Management Unit (CAMU), which will allow remediation waste to be placed there and used as a foundation layer without triggering certain regulations pertaining to disposal of waste. Soil remedies for the RI Sites utilize the CAMU for placement of excavated soil and/or debris from remedial actions at the sites. The soil and debris will be managed at the CAMU, incorporated within the landfill cover soils (foundation layer), and capped as part of the landfill.

The following is a description of the selected remedies for each site :

Sites 2 and 12

- Excavation of soil containing total petroleum hydrocarbons (TPH) and construction debris.

Placement of debris and contaminated soil at the OU 2 landfill.

- Extraction and treatment of groundwater containing volatile organic compounds (VOCs) by granular activated carbon (GAC), and disposal of treated water by (1) reuse aboveground, or (2) injection or infiltration of treated water back into the aquifer.
- A deed restriction will be placed on the property prohibiting drilling of water wells or use or access to groundwater affected by site contaminants.
- Institutional controls prohibiting residential use (such as deed restrictions) will be required unless a post remediation risk evaluation indicates the contaminant residual levels are appropriate for unlimited use.

Sites 16 and 17

- Excavation of soil containing TPH and construction debris. Placement of debris and soil at the OU 2 landfill.
- A deed restriction will be placed on the property prohibiting drilling of water wells or use or access to groundwater affected by contaminants.
- Institutional controls prohibiting residential use (such as deed restrictions) will be required unless a post remediation risk evaluation indicates the contaminant residual levels are appropriate for unlimited use.

Site 31

- Excavation of soil containing lead and incinerator debris. Placement of debris and soil at the OU 2 landfill.
- Institutional controls prohibiting residential use (such as deed restrictions) will be required unless a post remediation risk evaluation indicates the contaminant residual levels are appropriate for unlimited use.

Site 39

- Excavation of soil containing TPH, cyclotrimethylene trinitramine (RDX), and beryllium, and placement at the OU 2 landfill.

- Excavation and segregation of spent ammunition from soil containing residual lead. Recycling of spent ammunition and fragments at a metals refinery, and placement of lead-containing soil at the OU 2 landfill.
- Institutional controls prohibiting residential use (such as deed restrictions) will be required unless a post remediation risk evaluation indicates the contaminant residual levels are appropriate for unlimited use.

Surface Water Outfalls

- No further action for the surface water outfalls OF-1 through OF-14, -16 through -30, -32, and -33 based on a screening risk evaluation.
- Surface water outfall OF-31 is addressed as part of the Sites 2 and 12 remedial alternative.

Sites 25 and 33

- No further action for Site 25 based on a site-specific risk assessment.
- Institutional controls prohibiting residential use (such as deed restrictions) will be required unless a post remediation risk evaluation indicates the contaminant residual levels are appropriate for unlimited use.
- A deed restriction for other than residential type use based on a screening risk evaluation for Site 33.

1.5 Statutory Determination

The selected remedies are protective of human health and the environment, comply with federal and state applicable or relevant and appropriate requirements for these actions, and are cost effective. The remedies are intended to fully address the statutory mandate for permanence and treatment to the maximum extent practicable for the RI sites, surface water outfalls, and Sites 25 and 33. These remedies utilize permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable, and satisfy the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element.

- Soil and debris from Sites 2 and 12, 16 and 17, 31, and 39 will be reused as foundation layer material beneath the barrier layer at the OU 2 landfill, thereby reducing mobility.
- Spent ammunition from Site 39 will be recycled.
- Soil from the sites will be used as a resource for fill material needed to construct the cap at the OU 2 landfill, thereby reducing the volume of imported fill required.

A review of the groundwater remediation at Sites 2 and 12 will be conducted within five years after commencement of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

Because the selected remedies may result in contaminants remaining at the sites above levels that allow for unlimited use, a five year review will be performed after initiation of the selected action.

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2.0 DECISION SUMMARY

2.1 Site Description

Fort Ord is located near Monterey Bay in northwestern Monterey County, California, approximately 80 miles south of San Francisco. The base comprises approximately 28,000 acres adjacent to the cities of Seaside, Sand City, Monterey, and Del Rey Oaks to the south and Marina to the north. The Southern Pacific Railroad and Highway 1 pass through the western portion of Fort Ord, separating the beachfront from the rest of the base. Laguna Seca Recreation Area and Toro Regional Park border Fort Ord to the south and southeast, respectively. Land use east of Fort Ord is primarily agricultural.

2.2 Site History

Since its opening in 1917, Fort Ord has primarily served as a training and staging facility for infantry troops. No permanent improvements were made until the late 1930s, when administrative buildings, barracks, mess halls, tent pads, and a sewage treatment plant were constructed. In the 1940s, major construction of the Main Garrison was performed. From 1947 to 1975, Fort Ord was a basic training center. After 1975, the 7th Infantry Division (Light) was assigned to Fort Ord. Light infantry troops are those that perform their duties without heavy tanks, armor, or artillery. In 1991, Fort Ord was selected for closure. In 1993, the majority of the soldiers were reassigned to other Army posts. Fort Ord officially closed in September 1994. Although Army personnel still operate the base, no active army division is currently stationed there.

2.3 Enforcement and Regulatory History

Environmental investigations began at Fort Ord in 1984 at Fritzsche Army Airfield (FAAF) under Regional Water Quality Control Board (RWQCB) cleanup or abatement orders 84-92, 86-86, and 86-315. Investigations indicated the presence of residual organic compounds from fire drill burning practices at the Fire Drill Burn Pit (Operable Unit 1 or OU 1). The subsequent Remedial Investigation/Feasibility Study (RI/FS)

for OU 1 was completed in 1988, and cleanup of soil and groundwater began under RWQCB cleanup or abatement orders 86-87, 86-317, and 88-139. In 1986, further investigations began at the Fort Ord landfill (OU 2) and the preliminary site characterization was completed in 1988. In 1990, Fort Ord was placed on the EPA's National Priorities List (NPL) primarily because of volatile organic compounds (VOCs) found in groundwater beneath OU 2.

A Federal Facility Agreement (FFA) was signed by the Army, EPA, Cal/EPA's Department of Toxic Substances Control (DTSC; formerly the Toxic Substances Control Program of the Department of Health Services or DHS), and RWQCB. The FFA established schedules for performing remedial investigations and feasibility studies and requires that remedial actions be completed as expeditiously as possible. In 1991, the basewide RI/FS began for Sites 2 and 12, 16 and 17, 31, and 39, as well as other sites, and Fort Ord was placed on the Base Realignment and Closure (BRAC) list.

The final draft of the Basewide RI/FS was submitted in October 1995. A Proposed Plan summarizing remedial actions planned for these sites, the surface water outfalls, and Sites 25 and 33 was submitted for public review and comment on May 7, 1996 (*HLA, 1996a*). A separate Proposed Plan for RI Site 3 was submitted on May 7, 1996, because finalization of an environmental cleanup level was still being performed and would require separate scheduling (*HLA, 1996b*).

2.4 Highlights of Community Participation

On May 7, 1996, the Army presented the Proposed Plan for the RI Sites, surface water outfalls, and Sites 25 and 33 at Fort Ord to the public for review and comment (*HLA, 1996a*). The Proposed Plan presented the preferred alternatives for each site and summarized information in the Basewide RI/FS and other documents in the Administrative Record. These documents are available to the public at the following locations: Chamberlain Library, Building 4275, North-South Road, Presidio of

Monterey Annex (formerly Fort Ord), California, and Seaside Branch Library, 550 Harcourt Avenue, Seaside, California. The Administrative Record is available at Building 4463, Gigling Road, Presidio of Monterey Annex (formerly Fort Ord), California, Monday through Friday from 9:00 a.m. to 3:00 p.m.

Comments on the Proposed Plan were accepted during a 60-day public review-and-comment period that began on May 7 and ended on July 8, 1996. A public meeting was held on May 18, 1996, at the Embassy Suites Hotel in Seaside, California. At that time, the public had the opportunity to ask the Army questions and express concerns about the plan. In addition, written comments were accepted during the public comment period. Responses to comments received during the public comment period are included in the Responsiveness Summary presented in Section 3.0 of this document. Any significant changes to the Proposed Plan are included in Section 2.17.

2.5 Scope and Role of Response Actions

This ROD addresses planned remedial actions for RI Sites 2 and 12, 16 and 17, 31, 39, surface water outfalls OF-1 through -14, -16 through -30, -32, and -33, and Sites 25 and 33, as described in the basewide RI/FS and the Site Analytical Report (HLA, 1995a, 1995b). The planned remedial actions for these sites will be final remedies for protection of human health and the environment.

2.6 Summary of Site Risks

Potential human health risks and environmental impacts were evaluated in the Human Health Risk Assessment and Ecological Risk Assessment, respectively (HLA, 1995a). The Human Health Risk Assessment for each site evaluated the following potential risks associated with exposure to chemicals of potential concern:

- Potential adverse noncancer health risks were evaluated using the EPA's hazard index quotient. The EPA's threshold level of concern for noncancer effects is a hazard index greater than 1.
- Potential cancer health risks were evaluated using EPA and other toxicity values. The

National Contingency Plan (NCP) states that the point of departure for acceptable cancer risks is 1×10^{-6} , or a 1 in 1,000,000 chance that an individual exposed under the scenario evaluated would develop cancer. Risks in the range of 1×10^{-6} to 1×10^{-4} (a 1 in 10,000 chance of developing cancer) should be evaluated on a case by case basis.

- Blood-lead levels were evaluated using blood lead level modelling procedures. The EPA's threshold blood-lead level of concern is a level greater than 10 micrograms per deciliter ($\mu\text{g/dL}$), on the basis of a study by the Centers of Disease Control and Prevention (CDC). Children's exposures to lead that results in blood-lead levels greater than 10 $\mu\text{g/dL}$ may produce neurotoxicity. Applying this level to adult receptors such as construction workers is conservative and health-protective, because threshold levels suggested for adult receptors are higher. Thresholds suggested for workers range from 25 to 50 $\mu\text{g/dL}$, for hematological and cardiovascular endpoints (CDC, 1991; ATSDR, 1993). Therefore, the blood-lead level of concern of 10 $\mu\text{g/dL}$ is protective of both children and adults.

The Ecological Risk Assessment for each site evaluated potential adverse health effects of chemicals of potential concern on plant and animal species whose habitats are known to occur at the sites.

2.7 Remedial Action Objectives

The remedial action objectives for the sites are to reduce risks to human health and the environment and comply with federal and state applicable or relevant and appropriate requirements (ARARs). In addition, remediation of sites containing sensitive, threatened, or endangered species will be performed in accordance with the Habitat Management Plan (HMP) (COE, 1994).

2.8 Sites 2 and 12

2.8.1 Sites 2 and 12: Site History

- Site 2: The Main Garrison Sewage Treatment Plant (MGSTP) was the primary sewage treatment facility for Fort Ord, serving the majority of the housing areas

and the main industrial areas from the late 1930s until May 1990 when it was decommissioned. During operation, effluent from the MGSTP was discharged under permit to a storm drain that emptied onto Indianhead Beach during low tide and discharged to Monterey Bay during high tide.

- Site 12: Site 12 is comprised of four areas as described below (Plate 2):
 - Lower Meadow. This area was used for disposal of waste material such as scrap metal, oil, and batteries generated by the Department of Logistics (DOL). The depth of fill material is reportedly up to 30 feet. The area also appears to contain road construction waste. The Lower Meadow receives runoff from the DOL Automotive Yard. Several pipes appear to discharge runoff to the Lower Meadow; however, it is uncertain if these pipes were designed as drainage lines.
 - DOL Automotive Yard. This area includes several buildings, two wash racks, and a paint shop at Building 2726. The former buried muffler used to contain exhaust from engine testing at Wash Rack 2723 may also have been used for liquid waste storage at Building 2719. Activities at the DOL Automotive Yard included transmission repair, degreasing, engine testing, steam cleaning and washing vehicles, and petroleum/oil/lubricant storage.
 - Cannibalization Yard. This area was used from 1964 until 1994 to disassemble old equipment, primarily decommissioned military vehicles. Used motor oil was collected in pans and transferred to 55-gallon drums for storage. Other activities included draining/removing gasoline (leaded and unleaded), diesel fuel, brake fluid, asbestos-containing brake shoes and linings, antifreeze/coolants, lead and acid from batteries, lubricating greases, and transmission fluids. One oil/water separator at the northeast corner of the yard collects surface runoff from the area and has been in use since 1988.

- Southern Pacific Railroad (SPRR) Spur. This area consists of the right-of-way along a portion of a railroad spur that extends northward from the SPRR track west of Highway 1 and curves east through an industrial complex. Hydrocarbons may have been sprayed in this area for dust control.

2.8.2

Sites 2 and 12: Site Characteristics

No significant continuing source areas were identified at any of the Site 2 and 12 areas. The most common contaminants are metals, organic compounds, and TPH. The results of the remedial investigation indicate the following:

Soil

- At Site 2, the primary chemicals of potential concern detected in soil were low concentrations of organic compounds and metals.
- At Site 12, construction debris was landfilled in the Lower Meadow, and TPH was detected in the same area. In addition, TPH was detected in three other areas: the DOL Maintenance Yard, the Cannibalization Yard, and the SPRR Spur in between these two areas.

Groundwater

- The Upper 180-foot aquifer and the Lower 180-foot aquifer are present beneath Sites 2 and 12. These 180-foot aquifers are sand and gravel aquifers present in the Salinas Valley. The Upper 180-foot aquifer is unconfined, while the Lower 180-foot aquifer is confined. Depth to groundwater in the Upper 180-foot aquifer is approximately 40 to 80 feet below ground surface (bgs) and flows to the southwest, towards the Pacific Ocean. Groundwater in the Lower 180-foot aquifer flows east towards the Salinas Valley.
- Results of the remedial investigation indicate that dissolved VOCs have been detected in the Upper 180-foot aquifer that exceed their respective maximum contaminant levels (MCLs). VOCs have not been detected at concentrations above MCLs in the Lower 180-foot aquifer. The primary chemical of concern in

groundwater is trichloroethene (TCE), a solvent. Other similar compounds were also detected. A sandy silt layer dividing the two aquifers appears to have limited vertical migration of dissolved VOCs.

2.8.3 Sites 2 and 12: Summary of Site Risks

Human Health Risks. Chemicals of potential concern (COPCs) in soil and groundwater were identified on the basis of their concentrations, frequency of detection, and effects on human health. COPCs for this site include metals in soil at Sites 2 and 12, organic compounds in soil at Site 12, and metals and organic compounds (including TCE) in groundwater at Site 12. On the basis of the future uses proposed for the sites, the Human Health Risk Assessment evaluated risks to future onsite workers at Site 2 and future residents at Site 12. The onsite worker scenario for Site 2 is more conservative than a scenario involving state park open space use.

Site risks are summarized as follows:

Site 2:

- No adverse health effects are anticipated from exposure to COPCs. The hazard index calculated was 0.1, and the total cancer risk was 3×10^{-6} , of which 2×10^{-6} was due to background concentrations of metals such as arsenic in soil. The incremental cancer risk associated with site contaminants was 1×10^{-6} .

Site 12:

- Based on the risk assessment and blood lead level modelling, no adverse cancer or blood-lead level effects are anticipated from exposures to COPCs in soil or groundwater; however, potential noncancer effects exceeded the EPA's threshold level of concern.
- The maximum hazard index was 1.9, of which 1.2 was due to potential exposure to groundwater; this level exceeds the threshold level of concern. The total maximum cancer risk was 6×10^{-5} , of which 3×10^{-5} and 1×10^{-5} were due to potential exposure to site contaminants in groundwater and soil, respectively. The total risk due to background metals

concentrations was 2×10^{-5} ; therefore the incremental cancer risk associated with site contaminants was 4×10^{-5} . Based on blood lead level modelling, the maximum blood-lead level calculated was 7.64 mg/dL.

For a future onsite worker at Site 2, no unacceptable risks are anticipated. The maximum noncancer hazard index for Site 12 is above the EPA's threshold level of concern. Cancer risk estimates for a future resident at Site 12 are within EPA's target risk range, and modelled blood lead levels are below the EPA's threshold level of concern.

Ecological Impacts. The Ecological Risk Assessment identified lead as the only environmental COPCs for soil at Sites 2 and 12. The health of two special status species (black and silvery legless lizards) and the food base (e.g., mice) for predators such as raptors and foxes were evaluated.

- No unacceptable adverse effects on lizards are expected because usable habitat at the two sites is limited. Site 2 consists of large sewage treatment plant structures, and most of Site 12 is paved. Ecological impacts were evaluated by collecting plants and animals and measuring chemical concentrations in tissues. Tissue concentrations in prey were not likely to produce adverse effects in animal populations. Tissue concentrations in plants also did not indicate the surrounding habitat would be adversely affected.

2.8.4 Sites 2 and 12: Remedial Action Objectives

Proposed Reuse: The initial proposed reuse plan for Site 2 includes outdoor and indoor aquaculture facilities for raising fish and shellfish, with additional research facilities to support oceanographic studies. Additional reuse plans for Site 2 include an open space area. Reuse planned for Site 12 includes a central business district, light industrial areas, a high-tech business park, a transit center, retail businesses, medium- to high-density residential areas, and a school.

Remedial Action Objectives:

- No unacceptable human health risks are associated with direct exposure to soil; however, a remedial action objective for

protection of groundwater is to remediate TPH in soil to a concentration of 500 milligrams per kilogram (mg/kg) or less (HLA, 1994b).

- Human health risks are associated with potential exposure to groundwater; therefore, the remedial action objective for groundwater at Sites 2 and 12 is to remediate the Upper 180-foot aquifer to MCLs, and for some constituents more stringent levels, for the detected VOCs (See Table 1). The analysis used in identifying these levels was the same as the analysis used at OU 2 for obtaining aquifer cleanup levels.
- Removal of debris is a remedial action objective because contaminated soil may be intermixed with the debris.

To effectively evaluate remedial alternatives, Sites 2 and 12 were divided into four remedial units consisting of one groundwater remedial unit and three soil remedial units (Plate 2). Soil Remedial Unit 1 is the Lower Meadow Disposal Area, which contains approximately 16,000 cubic yards of concrete rubble and other construction debris mixed with limited volumes of TPH-affected soil. Soil Remedial Unit 2, the Outfall Area, receives surface runoff and storm drainage flow from surface water outfall OF-31 and several other storm drains, and consists of approximately 2,800 cubic yards of soil containing unknown diesel-like chemicals. Soil Remedial Unit 3 is the Cannibalization Yard Area, and consists of approximately 1,000 cubic yards of shallow soil containing TPH.

The remedial action objectives based on the risk assessments for Sites 2 and 12 are protective under the proposed reuse, i.e., onsite workers at Site 2 and residents at Site 12. At Site 2, since there are no unacceptable risks associated with soil, no soil remediation is necessary. At Site 12, the soil and debris that present unacceptable risks will be remediated to cleanup levels identified in Table 1. In addition, a post-remediation human health risk evaluation for soil at Sites 2 and 12 will be conducted. If this evaluation shows that the soils at Sites 2 and 12 are safe for any use, then deed restrictions will not be necessary. If deed restrictions are determined to be necessary, the appropriate restrictions will be attached to the

deed. The restriction will limit reuse and notify the potential owner of any residual contamination. Drilling of water wells or use or access to the groundwater affected by the contaminants at Sites 2 and 12, however, will continue to be restricted by deed until the groundwater cleanup levels are achieved.

2.8.5 Sites 2 and 12: Description of Alternatives

The following four remedial alternatives were evaluated in the Sites 2 and 12 Feasibility Study. For each alternative, both capital and annual operations and maintenance (O&M) costs were estimated. For alternatives requiring extended long term O&M, the net present value (NPV) of the money that would be spent over 30 years for O&M was also estimated.

Alternative 1

| | |
|-----------------------------|--------------------|
| Capital Cost: | \$0 |
| Annual O&M Cost: | \$119,000 |
| 30 Year O&M NPV: | \$1,838,000 |

- No action other than groundwater and surface water outfall monitoring. The no action alternative is required to be considered under CERCLA to provide a baseline for comparison to the other proposed alternatives.
- Assumes long-term monitoring program for existing groundwater wells and two surface water outfalls.

Alternative 2

| | |
|-----------------------------|--------------------|
| Capital Cost: | \$1,278,000 |
| Annual O&M Cost: | \$495,000 |
| 30 Year O&M NPV: | \$8,900,000 |

- Extraction of groundwater containing VOCs above cleanup goals (See Table 1) and discharge of untreated groundwater to a publicly owned treatment works (POTW).
- Deed restriction on groundwater use.
- Capping and surface water controls for soil at the Lower Meadow Disposal and Outfall Areas, which would prevent leaching of chemicals to groundwater.

- Excavation of approximately 1,000 cubic yards (cy) of shallow soil containing concentrations of TPH above the cleanup level of 500 milligrams per kilogram (mg/kg) (See Table 1) from the Cannibalization Yard, and placement at the OU 2 landfill.

Alternative 3

Capital Cost: \$2,160,000 - \$2,713,000
 Annual O&M Cost: \$338,000 - \$386,000
 30 Year O&M NPV: \$7,359,000 - \$8,656,000

- Groundwater extraction and treatment by granular activated carbon.
- Disposal of treated groundwater by: (1) reuse aboveground, or (2) injection or infiltration of treated water back into the aquifer.
- Deed restriction on groundwater use.
- Capping of debris and selective excavation of approximately 1,600 cubic yards of soil containing TPH concentrations above the cleanup goal of 500 mg/kg (See Table 1) from the Lower Meadow Disposal Area and placement at the OU 2 landfill.
- Excavation of approximately 3,800 cubic yards of soil containing TPH concentrations above the cleanup goal of 500 mg/kg (See Table 1) from the Outfall Area and Cannibalization Yard, and placement at the OU 2 landfill.

Alternative 4

Capital Cost: \$2,689,000 - \$3,242,000
 Annual O&M Cost: \$326,000 - \$375,000
 30 Year O&M NPV: \$7,711,000 - \$9,009,000

- Groundwater extraction, treatment, and disposal as described for Alternative 3.
- Deed restriction on groundwater use.
- Excavation of approximately 16,000 cubic yards of soil and debris containing TPH concentrations above the cleanup goal of 500 mg/kg (See Table 1) from the Lower Meadow Disposal Area, and placement at the OU 2 landfill.

- Excavation of approximately 3,800 cubic yards of soil containing TPH concentrations above the cleanup goal of 500 mg/kg (See Table 1) from the Outfall Area and Cannibalization Yard, and placement at the OU 2 landfill.

2.9 Sites 16 and 17

2.9.1 Sites 16 and 17: Site History

- Site 16: Site 16 is comprised of three areas as described below (Plate 3):
 - The DOL Maintenance Yard. This area has been used as a heavy equipment maintenance facility since the 1950s when the site was originally developed. Six buildings and structures enclosed within a fenced area are identified by number and current or previous use as follows:
 - Building 4900, the main maintenance yard building, is used primarily for vehicle repairs. Operations in Building 4900 included small arms weapons repair, a weapons bluing process, spray painting, and general vehicle repairs. A former 1,500-gallon diesel underground storage tank (UST) near Building 4900 was removed in March 1992.
 - Building 4901 is used for storage of unused motor oil.
 - Building 4902 is a wash rack. An oil/water separator is adjacent to the wash rack.
 - Building 4903 contains a diesel-powered steam cleaner. A 200-gallon aboveground diesel fuel tank adjacent to the building provided fuel to the steam cleaner by gravity feed.
 - Building 4904 was the former paint shop.
 - Building 4905 is used for storage of nonhazardous materials.

- Pete's Pond and Pete's Pond Extension. These areas have remained open space areas since development of the surrounding areas. Based on an aerial photograph review, these areas were used for refuse dumping sometime during the late 1940s and early 1950s.
- Site 17: Site 17 is comprised of three areas as described below:
 - 1400 Block Motor Pool Complex. This area, which includes Buildings 1476 through 1495, was constructed in about 1977. Since 1977, the motor pool operated at this location until the troop relocation in 1993. The facility was used to service motor vehicles including light and heavy trucks and other army vehicles. Materials that were stored at the 1400 Block Motor Pool Complex include lubricating oils, brake fluid, coolants, cleaning solvents, diesel, and gasoline. These materials are stored in fourteen USTs at the 1400 Block Motor Pool Complex and were removed as part of the UST program at Fort Ord. Eight other USTs have been removed from Site 17. The Site 17 Disposal Area has been used as a parking area and contains a washrack and grease rack. Based on aerial photographs it appears that material was buried extensively in this area between the late 1940s and early 1950s.
 - Storage Buildings on Fourth Avenue. These buildings were built in the 1940s for storage of various materials. For example, corrosive chemicals were stored in Buildings 1431 and 1435. Building 1442 previously housed an incinerator for waste generated from the first Fort Ord Hospital constructed in the 1940s. This building now houses an autoclave used to sterilize medical debris from the onbase Hays Hospital which was constructed in 1969.
 - Disposal Area. This area was used extensively to dispose of debris at Fort Ord; however, there are no known sources of information on site history related to disposal.

2.9.2 Sites 16 and 17: Site Characteristics

Results of the RI indicate the following:

Soil

- DOL Maintenance Yard: The primary chemicals of potential concern detected in near-surface soil samples were dioxins and light and heavy TPH, such as diesel (TPHd).
- Pete's Pond Extension: Incinerated debris and medical debris dating to the 1950s was landfilled in Pete's Pond Extension. Other detected debris included ordnance, glass bottles, metal, and one 55-gallon drum. Chemicals detected in soil samples included metals, organic compounds, TPH, and dioxins.
- Pete's Pond: Debris was detected in several areas of Pete's Pond. Total oil and grease (TOG), pesticides, metals, and dioxins were detected in soil samples from Pete's Pond.
- Site 17 Disposal Area: Incinerated and unincinerated debris from as early as 1935 was detected at the Site 17 Disposal Area. Unknown diesel-like chemicals and motor oil, metals, and dioxins were detected in soil samples from the Disposal Area.
- Site 17 Other Areas: TPH as diesel, silver, and copper were detected once each in soil samples from other areas at Site 17.

Groundwater

Two groundwater aquifers were investigated as part of the Sites 16 and 17 field investigation: the uppermost A-aquifer and the underlying Upper 180-foot aquifer. Organic chemicals have been detected in groundwater samples from monitoring wells at Sites 16 and 17. Chemicals detected include PCE, TCE, and carbon tetrachloride. The RI concluded that organic chemicals are related to the migration of chemicals from the OU 2 landfill, which is being addressed separately under the OU 2 ROD.

2.9.3 Sites 16 and 17: Summary of Site Risks

Human Health Risks. The COPCs identified for soil at Sites 16 and 17 are metals, dioxins, and volatile organic compounds (VOCs). The COPCs for groundwater at the sites are organic compounds and antimony. On the basis of the proposed future reuse of the sites, the Human Health Risk Assessment evaluated risks to:

- Student/faculty artist at the Site 17 Disposal Area, with additional exposure at Pete's Pond and Pete's Pond Extension.
- Utility worker at Pete's Pond and Pete's Pond Extension.
- Construction worker at the Site 17 Disposal Area and the DOL Maintenance Yard.
- Commercial worker at the DOL Maintenance Yard.

Site risks are summarized as follows:

- The maximum hazard index calculated was 1, which is equal to the threshold level of concern. The maximum total cancer risks were 9×10^{-7} , 7×10^{-8} , 1×10^{-6} , and 1×10^{-5} , for the student/faculty artist, utility worker, construction worker at the Site 17 Disposal Area, and commercial worker, respectively. Risks due to background concentrations were 2×10^{-7} , 5×10^{-8} , 6×10^{-7} , and 2×10^{-6} , respectively. The incremental cancer risks associated with site contaminants were 7×10^{-7} , 2×10^{-8} , 4×10^{-7} , and 8×10^{-6} , respectively.
- Based on blood lead level modelling, maximum blood-lead levels calculated were 4.73, 4.50, and 4.31 mg/dL for the student/faculty resident artist, utility worker, and construction worker at the Site 17 Disposal Area, respectively, which are below the threshold level of concern.

The results of the Human Health Risk Assessment indicate that no adverse health effects from exposure to the COPCs at the sites are anticipated for any of the potential site users evaluated.

- **Ecological Impacts.** The food base for predators, the health of the legless lizard, and the central maritime chaparral habitat

were evaluated in the Ecological Risk Assessment (ERA). Ecological impacts were evaluated by collecting plants and animals and measuring chemical concentrations in tissues. Tissue concentrations in prey were not likely to produce adverse effects in animal populations. Tissue concentrations in plants also did not indicate the surrounding habitat would be adversely affected.

2.9.4 Sites 16 and 17: Remedial Action Objectives

Proposed Reuse: Parts of Site 16 are proposed for public agency corporation yards for the City of Marina, the County of Monterey, and the Monterey-Salinas Transit District. Site 17 has been designated as part of the site for the new Monterey Bay campus of the California State University. Existing structures are to be used for student/faculty artists, lecture/laboratory spaces, and university administrative offices. In addition, the parcel will provide sites for new facilities, including additional residence halls, a permanent library building, and a science center.

Remedial Action Objectives:

- No unacceptable human health risks are associated with direct exposure to soil; however, a remedial action objective for protection of groundwater is to remediate TPH in soil to a concentration of 500 mg/kg or less (HLA, 1994b).
- Removal of debris is a remedial action objective because contamination in soil may be intermixed with the debris.

To effectively evaluate remedial alternatives, Sites 16 and 17 were divided into remedial units. A groundwater remedial unit was not developed because the chemical compounds detected in groundwater beneath the sites are associated with the OU 2 contaminant plume; therefore, the groundwater will be captured and treated as part of the OU 2 remediation program.

Two soil remedial units were identified (Plate 3). Soil Remedial Unit 1 consists of approximately 1,100 cubic yards of TPH-impacted soil at the DOL Maintenance Yard, and Soil Remedial Unit 2 consists of

approximately 67,000 cubic yards of medical and miscellaneous debris and associated impacted soil from Pete's Pond, Pete's Pond Extension, and the Site 17 Disposal Area. Approximately 3,600 cubic yards of soil and debris is from Pete's Pond and Pete's Pond Extension. The remaining soil and debris is from the Site 17 Disposal Area.

The remedial action objectives based on the risk assessments for Sites 16 and 17 are protective under the proposed reuse, i.e., student/faculty and workers. At Sites 16 and 17, the soil and debris that present unacceptable risks will be remediated to cleanup levels identified in Table 1. In addition, a post-remediation human health risk evaluation for soil at Sites 16 and 17 will be conducted. If this evaluation shows that the soils at Sites 16 and 17 are safe for any use, then deed restrictions will not be necessary. If deed restrictions are determined to be necessary, the appropriate restriction will be attached to the deed. The restrictions will limit reuse and notify the potential owner of any residual contamination. The groundwater will be treated as part of the OU 2 plume. Drilling of water wells or use or access to the groundwater affected by the contaminants at Sites 16 and 17 will continue to be restricted by deed until the groundwater cleanup levels are achieved.

2.9.5 Sites 16 and 17: Description of Alternatives

The following four remedial alternatives were evaluated in the FS.

Alternative 1

| | |
|-------------------------------|------------------|
| Capital Cost: | \$20,600 |
| Annual O & M Cost: | \$49,200 |
| 30 Year O&M NPV: | \$774,000 |

- No action would be taken at the site except continued groundwater monitoring. The no action alternative is required to be considered under CERCLA as a basis for comparison to other alternatives.

Alternative 2

| | |
|-----------------------------|--------------------|
| Capital Cost: | \$1,175,200 |
| Annual O&M Cost: | \$53,400 |
| 30 Year O&M NPV: | \$1,804,000 |

- Construction of a cap over the areas containing debris and TPH-affected soil to limit contact and prevent surface water infiltration. Deed restrictions would be required.

Alternative 3

| | |
|-----------------------------|--------------------|
| Capital Cost: | \$1,211,100 |
| Annual O&M Cost: | \$38,200 |
| 30 Year O&M NPV: | \$1,604,000 |

- Excavation of soil and debris from Pete's Pond and Pete's Pond Extension.
- Consolidation of debris from Pete's Pond and Pete's Pond Extension into the Site 17 Disposal Area, and placement of an impermeable cover layer material and 1-foot-thick layer of clean soil.
- Placement of TPH-affected soil at the OU 2 landfill, or treatment at the FOSTA, with onsite reuse.

Alternative 4

| | |
|-----------------------------|--------------------|
| Capital Cost: | \$5,158,000 |
| Annual O&M Cost: | \$0 |
| 30 Year O&M NPV: | \$5,158,000 |

- Excavation of soil and debris containing concentrations of TPH above the cleanup goal of 500 mg/kg from Pete's Pond, Pete's Pond Extension, and the Site 17 Disposal Area (see Table 1).
- Placement of soil and debris from these areas at the OU 2 landfill as part of the foundation layer material.
- Placement of TPH-affected soil at the OU 2 landfill.

2.10 Site 31

2.10.1 Site 31: Site History

Site 31, the Former Dump Site, was used for debris disposal in the 1940s and 1950s (Plate 4). A 500-ton incinerator was reportedly

located at the top of the ravine at Site 31 within the area now occupied by the Leadership Reaction Training Compound (LRTC). On the basis of interviews with Fort Ord personnel and field observations, most of the refuse observed on and within the ravine slope appears to date from the 1940s and 1950s. Refuse was wholly or partially incinerated and dumped over the northern slope of the ravine. The incinerator was removed and dumping ceased, and the LRTC was constructed and used as an obstacle training course. The site is currently not in use.

2.10.2 Site 31: Site Characteristics

Results of the RI indicate that the main source of contamination is incinerated debris and ash from burned refuse. Surface and subsurface incinerated and unincinerated debris at the site consists of glass, metal, coal, wood, concrete and asphalt, brick and clay tile, and ash. Chemicals detected in soil samples at the site include TPH as diesel, polynuclear aromatic hydrocarbon (PAHs), dibenzofuran, pesticides, dioxins, and some metals including lead. The chemicals appear to be related to the debris.

Because chemicals detected within soil at the site are relatively immobile and because groundwater is deep, groundwater quality was not investigated at this site. However, potential impacts to groundwater from COPCs in soil at this site were evaluated using a leaching model, and significant impacts were not anticipated.

2.10.3 Site 31: Summary of Site Risks

Human Health Risks. Metals, pesticides, dioxins, and PAHs were identified in the Human Health Risk Assessment as COPCs. On the basis of proposed future reuse of the site, the Human Health Risk Assessment evaluated risks to a nearby resident trespasser.

Site risks are summarized as follows:

- The maximum hazard index calculated was 0.02; and the total maximum cancer risk was 8×10^{-7} for the nearby resident trespasser, of which 4×10^{-7} was due to background concentrations of metals. The incremental risk associated with site contaminants was 4×10^{-7} . These levels are below levels of concern.

- Based on blood lead level modelling, the maximum blood-lead level calculated was 16.10 mg/dL for the nearby resident trespasser, which is above the threshold level of concern.

The Human Health Risk Assessment calculated an estimated cancer risk to the child trespasser to be below EPA's target risk range. The noncancer hazard index is below the EPA's threshold level of concern. However, a maximum blood-lead level of 16.1 µg/dL was calculated in the lead exposure evaluation, which is above the EPA's threshold level of concern. Adverse health effects from lead exposure could be associated with the site, and remediation based on these potential human health effects may be required. A health-based level of concern for lead in soil of 1,860 milligrams per kilogram (mg/kg) was developed. At this concentration, blood-lead levels would not be expected to exceed the 10 µg/dL threshold level.

Ecological Impacts. The food base (e.g., mice) for predators and the health of the silvery legless lizard were evaluated in the Ecological Risk Assessment. Ecological impacts were evaluated by collecting plants and animals and measuring chemical concentrations in tissues. Tissue concentrations in prey were not likely to produce adverse effects in animal populations. Tissue concentrations in plants also did not indicate the surrounding habitat would be adversely affected.

Groundwater: The potential impact to groundwater from detected organic chemicals was evaluated in the RI using VLEACH modeling on selected organic chemicals or groups of chemicals. With the exception of the TPHd surrogate dodecane, the results of the modeling indicated that these chemicals would not leach to groundwater over a 100-year period if left in place at maximum detected site concentrations. The modeling indicated that dodecane might leach to groundwater in 49 years and estimated a maximum concentration in groundwater of less than 0.01 µg/l in 100 years; this is not considered to represent a significant impact to groundwater.

2.10.4 Site 31: Remedial Action Objectives

Proposed Reuse: Precise future plans for Site 31 are unknown. Site 31 has been included within a 200-acre parcel slated to become the Monterey Agricultural Center, which will include facilities for agricultural production, storage, cooling, packaging, and distribution and approximately 250 housing units for families and farm workers. The area not developed within the parcel is to be set aside as open space/habitat. The steep nature of Site 31 and its natural habitats suggest that part will be set aside as open space.

Remedial Action Objectives:

- The remedial action objective for lead in soil is to remove soil containing lead intermixed with debris above the health-based level of concern of 1,860 mg/kg lead in surface soil developed in the Baseline Human Health Risk Assessment (HLA, 1995a).

On the basis of the health-based cleanup level for lead developed in the Human Health Risk Assessment, a single soil remedial unit was defined on the north slope of Site 31 (Plate 4). It consists of approximately 350 cubic yards of debris and soil. The remainder of the debris and soil at the site has not been shown to pose a human health risk or risk to the environment and would be very difficult to remove because of steep slopes and overhead powerlines. Also, there is potential for substantial damage to natural habitat areas if total debris removal is performed. The remaining debris is not proposed for remediation.

The remedial action objectives based on the risk assessment for Site 31 are protective under the proposed reuse, i.e., a child trespasser. Soil and debris associated with unacceptable risks will be remediated to cleanup levels identified in Table 1. A post-remediation human health risk evaluation will be conducted. If this evaluation shows that the soils at Site 31 are safe for any use, then deed restrictions will not be necessary. If deed restrictions are determined to be necessary, the appropriate restrictions will be attached to the deed. The restriction will limit reuse and notify the potential owner of any residual contamination. Additionally, a post-remediation ecological evaluation for Site 31 will be conducted. If this

evaluation indicates that the residual levels of chemicals of potential concern (COPCs) are protective of the ecological receptors at Site 31, the remedial action will be deemed complete. If not, further actions may be necessary.

2.10.5 Site 31: Description of Alternatives

The following four remedial alternatives were evaluated in the FS.

Alternative 1

| | |
|------------------|-----|
| Capital Cost: | \$0 |
| Annual O&M Cost: | \$0 |
| 30 Year O&M NPV: | \$0 |

- No action would be taken at the site. The no action alternative is required to be considered under CERCLA as a basis for comparison to other alternatives.

Alternative 2

| | |
|------------------|-----------|
| Capital Cost: | \$320,000 |
| Annual O&M Cost: | \$0 |
| 30 Year O&M NPV: | \$320,000 |

- Excavation and segregation of approximately 350 cubic yards of soil and debris containing lead above the health-based level of concern of 1,860 mg/kg (see Table 1).
- Placement of soil and debris at the OU 2 landfill as part of the foundation layer.
- Deed restrictions.

Alternative 3

| | |
|------------------|-----------|
| Capital Cost: | \$410,000 |
| Annual O&M Cost: | \$2,100 |
| 30 Year O&M NPV: | \$445,000 |

- Excavation of approximately 350 cubic yards of soil and debris containing lead above the health-based level of concern of 1,860 mg/kg (see Table 1), and consolidation onsite. The consolidated soil and debris would be capped to limit potential direct human exposure to the waste materials and water infiltration and to limit offsite migration of debris and lead-containing soil. Deed restrictions would be required.

Alternative 4

| | |
|------------------|-----------|
| Capital Cost: | \$335,000 |
| Annual O&M Cost: | \$0 |
| 30 Year O&M NPV: | \$335,000 |

- Excavation of approximately 350 cubic yards of soil and debris containing lead above the health-based level of concern of 1,860 mg/kg.
- Offsite transportation and disposal at a Class I landfill facility.
- Deed restriction.

2.11 Site 39**2.11.1 Site 39: Site History**

The Inland Ranges were reportedly used since the early 1900s for ordnance training exercises, including onshore naval gunfire (Plate 5). Over the years, various types of ordnance have been used or found in the Inland Ranges, including hand grenades, mortars, rockets, mines, artillery rounds, and small arms rounds. Some training activities using petroleum hydrocarbons were also conducted. The 2.36-inch Rocket Range was used as an antitank rocket (bazooka) range during and shortly after World War II. Both range areas are inactive because of the Fort Ord closure.

2.11.2 Site 39: Site Characteristics**Soil**

Results of the RI indicate that explosive compounds, organic compounds, and the metals lead and beryllium are present in shallow soil above background concentrations in localized areas. Metals and TPH were detected in shallow soil adjacent to or within three trenches used for fire and smoke demonstrations.

Spent ammunition found at the small arms ranges consists of bullets, black powder rifle balls, and lead shot. Lead is the primary chemical of concern in soil. Localized areas have more than 10 percent of the surface area covered with spent ammunition. In general, ordnance used at the site includes small arms ammunition, grenades, rockets, mortars, artillery rounds, mines, and bombs. High

densities of ordnance and explosives occur near targets.

Groundwater

Antimony and nitrate were detected at concentrations consistent with background (naturally occurring) concentrations in wells at Site 39 installed as part of the basewide groundwater monitoring program.

2.11.3 Site 39: Summary of Site Risks

Human Health Risks. The chemicals of potential concern identified for soil are explosive compounds such as cyclotrimethylene trinitramine (RDX), semivolatile organic compounds, and metals. Groundwater chemicals of potential concern are metals and nitrate. On the basis of the proposed future reuse of the site, risks to a habitat management worker and a nearby resident were evaluated in the Human Health Risk Assessment.

Site risks are summarized as follows:

- The maximum hazard indexes calculated were 1 and 0.004, and the total maximum cancer risks were 8×10^{-5} and 3×10^{-6} for the onsite habitat management worker and offsite resident, respectively. The risks associated with background were 6×10^{-6} and 5×10^{-7} , and the incremental risks associated with site contaminants were 7×10^{-5} and 3×10^{-6} , respectively. The hazard index of 1 is at the threshold level of concern.
- Based on blood lead level modelling, the maximum blood-lead levels calculated were 5.13 and 3.93 mg/dL for the onsite habitat management worker and offsite child resident, respectively. These levels are below the threshold level of concern.

The results of the Human Health Risk Assessment indicate that the hazard index for noncancer-causing chemicals is not above the EPA's threshold level of concern. Cancer risks are within the EPA's target risk range, and calculated blood-lead levels are below the EPA threshold blood-lead level of 10 µg/dL. However, the health-based level of concern for lead in soil of 1,860 mg/kg will also be used for Site 39 in areas in the Small Arms Ranges

where the surface distribution of spent ammunition is greater than 10 percent. These areas are similar to those at Site 3 where the health-based level of concern roughly correlates to areas where more than 10 percent of the surface is covered by spent ammunition.

Ecological Impacts. The silvery legless lizard, the food base (e.g., mice) for predators such as foxes and raptors, mourning doves and their young, and the central maritime chaparral habitat were in the Ecological Risk Assessment. Ecological impacts were evaluated by collecting plants and animals and measuring chemical concentrations in tissues. Tissue concentrations in prey were not likely to produce adverse effects in animal populations. Tissue concentrations in plants also did not indicate the surrounding habitat would be adversely affected.

2.11.4 Site 39: Remedial Action Objectives

Proposed Reuse: The proposed reuse of most of the Inland Ranges will be as a Natural Resource Management Area and public access will be restricted. The Range 35 area will be used as a peace officer training area. Areas along the south boundary of the Inland Ranges (and Fort Ord) are proposed for several uses, including city and county parks, a school expansion and relocation of Highway 68.

Remedial Action Objectives:

- No unacceptable human health risks are associated with direct exposure to soil; however, a remedial action objective for protection of groundwater is to remediate TPH in soil to a concentration of 500 mg/kg or less.
- The remedial action objective for lead, RDX, and beryllium in soil is to remove soil containing these chemicals above the health-based level of concern and risk-based target cleanup levels (TCLs) of 1,860 mg/kg for lead, 0.5 mg/kg for RDX, and 2.8 mg/kg for beryllium in surface soil, respectively (HLA, 1995a).
- Removal of spent ammunition is a remedial action objective because it is a source of lead in soil.

To effectively evaluate remedial alternatives, Site 39 was divided into two soil remedial units (Plate 5). Soil Remedial Unit 1 consists of approximately 420 cubic yards of soil with detectable concentrations of the explosive compound RDX and TPH above the target cleanup levels in Ranges 40A and 33 and the Explosive Ordnance Target Area. Soil Remedial Unit 2 consists of approximately 4,100 cubic yards of soil containing lead and beryllium above the health based levels of concern in the Small Arms Ranges and the Explosive Ordnance Target Area.

The remedial action objectives based on the risk assessment for Site 39 are protective under the proposed reuse, i.e., a nearby resident trespasser. Soil and debris associated with unacceptable risks will be remediated to cleanup levels identified in Table 1. A post-remediation human health risk evaluation will be conducted. This evaluation may show that the soils at Site 39 are safe for any use, however, deed restrictions will continue to be necessary because ordnance and explosives (OE) have not been addressed at the site. The appropriate restriction will be attached to the deed which will limit reuse and notify the potential owner of any residual contamination, including OE. Additionally, a post-remediation ecological evaluation for Site 39 will be conducted. If this evaluation indicates that the residual levels of the chemicals of potential concern (COPCs) are protective of the ecological receptors at Site 39, the remedial actions will be deemed complete. If not, further actions will be necessary.

2.11.5 Site 39: Description of Alternatives

The following four remedial alternatives were evaluated in the FS.

Alternative 1

| | |
|------------------|-----|
| Capital Cost: | \$0 |
| O&M Cost: | \$0 |
| 30 Year O&M NPV: | \$0 |

- No action would be taken at the site except continued groundwater monitoring. The no action alternative is required to be considered under CERCLA as a basis for comparison to other alternatives.

Alternative 2

| | |
|-----------------------------|-----------|
| Capital Cost: | \$92,000 |
| Annual O&M Cost: | \$2,000 |
| 30 Year O&M NPV: | \$122,000 |

- Institutional controls including: (1) construction of a perimeter fence to restrict and completely enclose the remedial units at Site 39, (2) posting of warning placards at appropriate intervals along the fence, and (3) land use (deed) restrictions placed on the property for future development.

Alternative 3

| | |
|-----------------------------|-------------|
| Capital Cost: | \$1,184,000 |
| O&M Cost: | \$0 |
| 30 Year O&M NPV: | \$1,184,000 |

- Excavation of approximately 4,520 cubic yards of soil.
- Soil containing TPH and RDX above the cleanup goal and health-based level of concern of 500 and 0.5 mg/kg, respectively (see Table 1), would be placed at the OU 2 landfill.
- Soil containing lead and beryllium concentrations above the health-based levels of concern of 1,860 and 2.8 mg/kg, respectively (see Table 1), would be placed in the OU 2 landfill.
- Deed restrictions until remaining OE is removed.

Alternative 4

| | |
|-----------------------------|-------------|
| Capital Cost: | \$1,293,000 |
| O&M Cost: | \$0 |
| 30 Year O&M NPV: | \$1,293,000 |

- Excavation of approximately 4,520 cubic yards of soil.
- Soil containing TPH and RDX above the cleanup goal and health-based level of concern of 500 and 0.5 mg/kg, respectively, would be placed at the OU 2 landfill.
- Soil containing lead and beryllium above the health-based levels of concern of 1,860 and 2.8 mg/kg, respectively, would be transported offsite and disposed at a Class I

landfill facility, and spent ammunition would be screened and recycled.

- Deed restrictions until remaining OE is removed.

2.12 Surface Water Outfalls**2.12.1 Surface Water Outfalls: Site History**

The Basewide Surface Water Outfall Investigation (SWOI) evaluated contamination within and adjacent to thirty five outfalls and manholes. The outfalls at Fort Ord are part of a surface water drainage system made up of aboveground natural and engineered drainages that discharge to or receive discharge from the subsurface storm drain system. Water in the drainage system may have come in contact with areas of known historical chemical usage. The surface water outfalls OF-1 through -14, -16 through -30, -32, and -33 are included in this ROD because they were investigated as part of the Basewide RI/FS.

2.12.2 Surface Water Outfalls: Site Characteristics

Results of the SWOI indicated soil and sediment near or in the surface water outfalls contained the following contaminants: TPH, organic chemicals, pesticides, lead, cadmium, and polychlorinated biphenyls (PCBs).

2.12.3 Surface Water Outfalls: Summary of Site Risks

COPCs in soil and sediment from the surface water outfalls were evaluated in a Human Health Screening Risk Assessment (SRE). Based on the SRE, soil and sediment from OF-15, -34, and -35 should be removed for the protection of human health. These areas will be excavated and handled under the Interim Action Program (HLA, 1993). No further action is required for the other outfalls investigated.

2.12.4 Surface Water Outfalls: Remedial Action Objectives

There are no remedial action objectives for the surface water outfalls OF-1 through -14, -16 through -30, -32, and -33 because the SREs indicated there are no unacceptable risks to human health and the environment associated

with the presence of chemicals at most of the outfalls. Surface water outfalls OF-15, -34, and -35 are not addressed in this ROD, but will be addressed separately under the Interim Action (IA) ROD (HLA, 1994a).

2.13 Sites 25 and 33

2.13.1 Sites 25 and 33: Site History

Site 25: This is an 11-acre, unpaved field in the Main Garrison used from 1950 to 1972 to store decommissioned equipment, including transformers containing PCBs. It was later used for military training and vehicle parking.

Site 33: This is the golf course maintenance area consisting of a pesticide mixing area, an unpaved surface drainage area, and a former pesticide storage area. The golf course was established in the early 1950s, and pesticides and herbicides were used regularly since operations began.

2.13.2 Sites 25 and 33: Site Characteristics

Site 25: PCBs and pesticides were detected at Site 25 in shallow soil. The metals cadmium, mercury, and zinc were detected at concentrations above background (naturally occurring) concentrations.

Site 33: Pesticides, herbicides, and metals were detected in soil at concentrations below preliminary remediation goals (PRGs) set for reuse of this site.

2.13.3 Sites 25 and 33: Summary of Site Risks

Site 25: The Human Health Risk Assessment for soil at Site 25 evaluated exposure of a construction worker and resident to COPCs. Based on the assessment, adverse health effects are not expected, and no further action is required at the site. A quantitative Ecological Risk Assessment was performed. Ecological impacts were evaluated by collecting plants and animals and measuring chemical concentrations in tissues. Tissue concentrations in prey were not likely to produce adverse effects in the animal populations. Tissue concentrations in plants also did not indicate the surrounding habitat would be adversely affected.

Site 33: The Human Health Risk Assessment for soil at Site 33 evaluated exposure of a golf course maintenance worker to COPCs. Based on the assessment, adverse health effects are not expected for the proposed reuse. A quantitative Ecological Risk Assessment was performed. Ecological impacts were evaluated by collecting plants and animals and measuring chemical concentrations in tissues. Tissue concentrations in prey were not likely to produce adverse effects in animal populations. Tissue concentrations in plants also did not indicate the surrounding habitat would be adversely affected.

2.13.4 Sites 25 and 33: Remedial Action Objectives

There are no remedial action objectives for Site 25 because the risk assessment indicated there are no unacceptable risks to human health and the environment associated with the presence of chemicals at this site. The remedial action objective for Site 33 is to maintain restrictions on the deed to the property for other than residential type use.

2.14 Summary of Alternatives Comparison

Nine criteria established by CERCLA were used to evaluate the alternatives in the detailed analysis step for each of the RI sites. The nine criteria encompass statutory requirements and include other technical, economic, and practical factors that assist in comparing the overall feasibility and acceptability of the cleanup alternatives. The nine criteria are summarized as follows:

Overall Protection of Human Health and the Environment. Addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure route are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs). Addresses whether or not a remedy will meet all of the ARARs or provide grounds for invoking a waiver of the requirements.

Long-Term Effectiveness and Permanence.

Refers to the magnitude of residual risk and the ability of a remedy to maintain reliable protection of human health and the environment after cleanup goals have been met.

Reduction of Toxicity, Mobility, or Volume Through Treatment. Evaluates the anticipated performance of the treatment technologies that may be employed in a remedy.

Short-Term Effectiveness. Refers to the speed with which the remedy achieves protection, as well as the remedy's potential to create adverse impacts on human health and the environment that may result during the construction and implementation period.

Implementability. Refers to the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the selected solution.

Cost. Evaluates capital and operating and maintenance costs for each alternative by performing present-worth cost analyses.

State Acceptance. Indicates whether, based on its review of the RI/FS reports and Proposed Plan, the state concurs with, opposes, or has no comment on each alternative.

Community Acceptance. Assesses general public response to the Proposed Plan following a review of the public comments received on the RI/FS reports and the Proposed Plan during the public comment period and open community meeting(s).

The selected remedy must meet the first two of the nine CERCLA screening criteria described above: protection of human health and the environment as well as compliance with ARARs. The next five criteria are primarily balancing criteria used for comparison with other remedial action alternatives. The final two criteria, state and community acceptance, are used to address the concerns of state agencies and surrounding communities.

The remedial alternatives discussed above were evaluated on the basis of these criteria in the FS (HLA, 1995a). Tables 2 through 5 present summaries of these evaluations for each of the sites.

2.15 The Selected Remedies

Each alternative for the RI sites was assessed against the nine EPA evaluation criteria described in Tables 2 through 5. Using the results of this assessment, the Army compared the alternatives and selected a preferred alternative for each site. The SREs for surface water outfalls OF-1 through -14, -16 through -30, -32, and -33 indicated no further action is required for these areas. The risk evaluation for Site 25 indicated no further action was required at this site. The remedy for Site 33 will be a deed restriction on the property for nonresidential use.

2.15.1 Sites 2 and 12: Selected Remedy

Alternative 4 was selected as the remedy in accordance with the EPA's nine evaluation criteria described in Table 2, because it provides the greatest degree of protection for the environment, removes any potential unknown risks associated with debris, complies with ARARs, is effective in the short and long term, is cost effective, and is readily implementable.

Alternative 4 met the first two screening criteria and was judged to be superior in the following three balancing criteria:

- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, and volume of chemicals
- Short-term effectiveness

The U.S. EPA and the State of California (Cal/EPA or DTSC and RWQCB) concur with the selection of Alternative 4. Community acceptance is discussed in the responsiveness summary (Section 3.0). Details regarding soil and groundwater remedial actions under the selected alternative are presented in Section 2.8.

2.15.2 Sites 16 and 17: Selected Remedy

Alternative 4 is the selected remedy based on the assessment in the FS and as summarized in Table 3. Alternative 4 met the first two screening criteria and was judged to be superior in the following balancing criteria:

- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, and volume of chemicals
- Short-term effectiveness

In addition, this alternative eliminates any potential unknown risk associated with the debris at the sites, and provides foundation layer material for the OU 2 landfill. The increased cost associated with complete removal of the debris will be partly offset by reuse of the material at the OU 2 landfill. Reuse will result in a cost savings on the material needed for the foundation layer.

The State of California (Cal/EPA, DTSC and RWQCB) concurs with the selection of Alternative 4. Community acceptance is discussed in the responsiveness summary (Section 3.0). Details regarding soil remedial actions under the selected alternative are presented in Section 2.9.

2.15.3 Site 31: Selected Remedy

Alternative 2 is the selected remedy based on the assessment in the FS and as summarized in Table 4. Alternative 2 met the first two screening criteria and was judged to be superior in the following balancing criteria:

- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, and volume of chemicals
- Short-term effectiveness

In addition, this alternative eliminates any potential unknown risk associated with the debris at the site, and provides foundation layer material for the OU 2 landfill.

The U.S. EPA and the State of California (Cal/EPA or DTSC and RWQCB) concur with the selection of Alternative 2. Community acceptance is discussed in the responsiveness summary (Section 3.0). Details regarding soil remedial actions under the selected alternative are presented in Section 2.10.

2.15.4 Site 39: Selected Remedy

Alternative 3 is the selected remedy based on the assessment in the FS and as summarized in Table 5. Alternative 3 met the first two screening criteria and was judged to be superior in the following balancing criteria:

- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, and volume of chemicals
- Short-term effectiveness

In addition, this alternative eliminates any potential unknown risk associated with spent ammunition and explosive compounds at the site and provides foundation layer material for the OU 2 landfill.

The U.S. EPA and the State of California (Cal/EPA or DTSC and RWQCB) concur with the selection of Alternative 3. Community acceptance is discussed in the responsiveness summary (Section 3.0). Details regarding soil remedial actions under the selected alternative are presented in Section 2.11.

2.15.5 Surface Water Outfalls: Selected Remedy

No further action is required for surface water outfalls OF-1 through -14, -16 through -30, -32, and -33.

2.15.6 Sites 25 and 33: Selected Remedy

The selected remedy for Site 25 based on the risk assessment is no action. The selected remedy for Site 33 is a deed restriction with reuse restricted to other than residential type use.

2.16 Statutory Determinations

2.16.1 Protection of Human Health and the Environment

The selected remedies provide the greatest degree of protection for human health and the environment. Implementation of the selected remedies include:

- Removal of contaminated soil from areas where concentrations of chemicals exceed the health-based levels of concern or cleanup levels and placement in an engineered landfill.
- Removal of debris from several different areas of potential contact and consolidation in one location in a closed landfill with an engineered landfill cap.
- Recycling of the source of metals contamination, i.e., spent ammunition.

2.16.2 Compliance with ARARs

The selected remedies comply with ARARs. ARARs are "applicable" or "relevant and appropriate" requirements that the Army is required to comply with. The categories of ARARs are: action-specific, chemical-specific, and location-specific. Action-, chemical-, and location-specific ARARs for the selected alternatives for each site are presented in Appendix A. In addition to complying with ARARs, the Army has the discretion to consider guidance and health advisories as "to-be-considered" (TBC) requirements. Those TBCs that the Army selects become performance standards that must be complied with.

2.16.3 Cost Effectiveness

The selected remedies are cost-effective solutions for reducing risks to human health and the environment. Costs associated with the surface water outfalls are addressed under the Interim Action Program (HLA, 1994b). The estimated costs of the selected remedies are as follows:

Sites 2 and 12:

| | |
|------------------|-------------------------|
| Capital Cost: | \$2,689,000 - 3,242,000 |
| Annual O&M Cost: | \$326,000 - \$375,000 |
| 30 Year O&M NPV: | \$7,711,000 - 9,009,000 |

Sites 16 and 17:

| | |
|------------------|-------------|
| Capital Cost: | \$5,158,000 |
| Annual O&M Cost: | \$0 |
| 30 Year O&M NPV: | \$5,158,000 |

Site 31:

| | |
|------------------|-----------|
| Capital Cost: | \$320,000 |
| Annual O&M Cost: | \$0 |
| 30 Year O&M NPV: | \$320,000 |

Site 39:

| | |
|------------------|-------------|
| Capital Cost: | \$1,184,000 |
| O&M Cost: | \$0 |
| 30 Year O&M NPV: | \$1,184,000 |

Costs for these alternatives are generally lower than the treatment alternatives and commensurate with the higher level of protection of human health and the environment provided relative to the no action alternative.

2.16.4 Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies

The selected remedies use permanent solutions, alternative treatment technologies, and resource recovery technologies to the maximum extent practicable.

- Placement of soil and debris at the OU 2 landfill is an innovative, cost-effective waste management approach, and significantly reduces the need for additional resources such as backfill material for construction of the foundation layer for capping and closure of the existing landfill.
- Recycling of spent ammunition is a permanent solution and resource recovery technology that provides beneficial reuse of the metals present in spent ammunition.

2.16.5 Preference for Treatment as a Principal Element

The selected remedies satisfy the statutory preference for treatment as a principal element in addressing the human health and environmental threats posed by the RI sites to the extent possible. The selected remedies eliminate the sources of contamination to soil and groundwater, and reduce the mobility of the chemicals in soil through placement under an engineered landfill cap. In addition, the remedies separate and recycle the metals in

spent ammunition, and reuse soil and debris as foundation layer material for the cap at the OU 2 landfill.

Treatment of soil will not be performed because an equally protective alternative is available through placement at the OU 2 landfill.

2.17 Documentation of Significant Changes

As described in the Responsiveness Summary (Section 3.0), the Proposed Plan for the RI Sites was released for public comment on May 7, 1996, and a public meeting was held on May 18, 1996. This Proposed Plan identified preferred remedial alternatives for Sites 2 and 12, 16 and 17, 31, 39, the surface water outfalls, and Sites 25 and 33. A change to the preferred alternative for Site 33 described in the Proposed Plan (no further action) was made. This change includes the institutional control of a deed restriction for other than residential type use of the property at the Site 33 Golf Course.

Comments collected over the 60-day public review period between May 7 and July 8, 1996 did not necessitate any significant changes to the conclusions or procedures outlined in the Basewide RI /FS and RI Sites Proposed Plan.

3.0 RESPONSIVENESS SUMMARY

3.1 Overview

At the time of the public review period for the Army's Remedial Investigation/Feasibility Study and Proposed Plan for the RI and other sites, the Army identified preferred remedial alternatives for each site. The preferred remedial alternative consist of the following:

Sites 2 and 12

- Excavation of soil containing TPH and construction debris. Placement of debris and soil at the OU 2 landfill.
- Extraction and treatment of groundwater containing VOCs by granular activated carbon and disposal of treated water by one of the following methods: (1) aboveground reuse, or (2) injection or infiltration of treated water back into the aquifer.
- Deed restrictions on groundwater and a post remediation risk assessment to assess the need for institutional controls.

Sites 16 and 17

- Excavation of soil containing TPH and construction debris. Placement of debris and soil at the OU 2 landfill.
- Deed restrictions on groundwater and a post remediation risk assessment to assess the need for institutional controls.

Site 31

- Excavation of soil containing lead and incinerator debris. Placement of debris and soil at the OU 2 landfill.
- A post remediation risk assessment to assess the need for institutional controls.

Site 39

- Excavation of soil containing TPH and explosive residue compounds, and placement at the OU 2 landfill.
- Excavation and segregation of spent ammunition from soil containing residual

lead. Recycling of spent ammunition and fragments and placement of lead-containing soil at the OU 2 landfill.

- A post remediation risk assessment to assess the need for institutional controls.

Sites 25 and 33

- No further action for Site 25 based on a site-specific risk assessment. A deed restriction on Site 33 based on a screening risk evaluation.

Surface Water Outfalls

- No further action at surface water outfalls OF-1 through -14, -16 through -30, -32, and -33.

Summary of Public Comments

On the basis of the written and verbal comments received, the Army's Proposed Plan was generally accepted by the public. However, several citizens expressed concerns regarding the following issues:

- The handling of OE at the RI sites, as well as the physical hazards associated with spent ammunition and OE and implementation of institutional controls.
- Long-term monitoring to evaluate the effectiveness of planned remedial actions.
- Concerns regarding the capacity and design of the CAMU at the OU 2 landfill.
- The role of the state in officially commenting on the RI/FS and Proposed Plan regarding the California Environmental Quality Act (CEQA) and other state ARARs.
- Amendment of the OU 2 ROD to address the OU 2 landfill's designation as a CAMU to receive excavated soil from the RI sites.

3.2 Background on Community Involvement

In 1991, Fort Ord was added to the BRAC List. The economic impact of Fort Ord's imminent closure has created much community interest relative to the potential economic reuse of portions of Fort Ord. Specifically, the RI and other sites are under consideration for reuse for residential, commercial, and business development by the Fort Ord Reuse Authority (FORA).

Focused community involvement regarding the RI and other sites has most recently involved the public review of the Army's Remedial Investigation/Feasibility Study and Proposed Plan for the RI sites (HLA, 1995a, 1996a). A 30-day public comment period began May 7, 1996 and was extended to 60 days at the request of the public, closing on July 8, 1996. A public meeting was held on May 18, 1996 to present the Army's Proposed Plan to the public describing the CAMU and planned remedial actions at the RI and other sites.

This responsiveness summary responds to written comments received during the public comment period as well as oral comments expressed during the public meeting.

3.3 Summary of Comments Received During the Public Comment Period and Department of the Army Responses

Comments raised during the RI Sites Proposed Plan public comment period are summarized below. The comments received from the comment period are categorized by relevant topics.

3.3.1 Technical Questions/Concerns Regarding Remedial Alternatives

- In general, the public accepted the proposed remedial alternatives. Several interested parties were concerned about how institutional controls, removal of OE, and physical hazards associated with spent ammunition and OE would be handled under the remedial alternatives.

Department of the Army's Response:

Institutional controls such as access restrictions described in the remedial alternatives for each of the sites will be implemented in conjunction with land use scenarios dictated by the FORA Reuse Plan (FORA, 1994). OE, spent ammunition and any associated potential physical hazards are not regulated under CERCLA and will be addressed under a separate action. A post-remediation risk assessment will be conducted to evaluate the degree of cleanup and develop specific deed restrictions, if necessary. The post-remediation risk assessment may show that the sites are safe for any use and deed restrictions are not necessary.

- In general, several citizens expressed concern over how long-term monitoring for groundwater treatment effectiveness and saltwater intrusion at Sites 2 and 12 would be implemented.

Department of the Army's Response: In order to evaluate the long-term effectiveness and potential for saltwater intrusion at Sites 2 and 12, up to 30 years of groundwater monitoring with a five year review period is part of the selected cleanup alternative. In addition, treated water may be injected into the aquifer to control saltwater intrusion.

- Interested parties expressed concern about the CAMU; specific concerns were as follows:
 - A citizen stated "I have concerns that the OU 2 landfill CAMU may not be able to accommodate all the soil planned for disposal at the OU 2 site. How accurate are the projections about the amount of soil needed as the foundation layer for the cap, and the amount of soil planned for removal to the OU 2 landfill CAMU?"

Department of the Army Response: If excess materials are generated, the landfill cover grades can be modified in the field to accommodate all the soil and documented as as-built conditions. The Design Analysis (HLA, 1995) allows for flexibility in the final waste volume without affecting the efficiency or effectiveness of the design.

- A citizen expressed concern about the design of the landfill, including the liner, the prevention of leakage to the surrounding soil, and the integrity of the landfill "structure."

Department of the Army Response: The OU 2 landfill cover system was developed in the OU 2 feasibility study (*Remedial Investigations/Feasibility Study, Site 2 Landfills, Fort Ord, California*, Dames & Moore, December 18, 1992) and recommended in the ROD (*Final Record of Decision, Operable Unit 2, Fort Ord Landfills, Fort Ord, California*, U.S. Army, June 22, 1994). Design details are presented in the Design Analysis (*Draft Final Design Analysis, Fort Ord OU 2 Landfill Final Closure*, Harding Lawson Associates, December 5, 1995), Specifications (*Specification No. 9705, Fort Ord OU 2 Landfill Final Closure, Fort Ord, California*, Harding Lawson Associates, July 5, 1995), the Closure Plan (*Final Closure and Postclosure Maintenance Plan, Fort Ord OU 2 Landfill Final Closure, Fort Ord, California*, Harding Lawson Associates, December 5, 1995), and the Design Drawings (*Fort Ord OU 2 Landfill Final Closure*, October 20, 1995).

The landfill cover will consist of a foundation layer to support the upper layers of the cover, a liner, and a vegetative layer to protect the liner and support the growth of native vegetation. The purpose of the liner is to minimize the infiltration of stormwater into the refuse. The cover will be constructed in accordance with California Code of Regulations Title 23, Division 3, Chapter 15, which contains landfill closure requirements.

- A citizen expressed concern about the mixing of wastes in the CAMU, specifically: interactions of organic and inorganic chemistries, shifting earth, water encroachments, solubilities, pH of the soil and the CAMU contents, and their reactions with the liner and UXO. The citizen also expressed concern about the composition of "source excavations."

Department of the Army's Response: The liner will not be in contact with the wastes. A technical memorandum addressing these

issues is in preparation and will become part of the public record. The landfill cover design has taken into account seismicity in the Monterey area and the potential for both short-term and long-term settlement of the waste mass. The cover system will reduce infiltration of water into the wastes. Available information on the composition of materials to be excavated and placed in the CAMU is presented in the Final RI/FS (HLA, 1995).

3.3.2 Costs/Funding Issues

- Several citizens expressed concern that the cost estimates for remediation of the sites did not include costs associated with removal of OE.
- Department of the Army's Response: OE will be addressed under a separate action; therefore, costs were included for OE clearance in excavation areas only.

3.3.3 Enforcement

- Several citizens expressed concern that the DTSC's official comments had not addressed CEQA, and the list of ARARs should include California Civil Code d3479 regarding residual contamination creating a public nuisance. Another citizen said they would accept the remedial alternatives outlined in the Proposed Plan if: (1) the DTSC and California Fish and Game officially concurred, and (2) the RAB Water Committee's concerns regarding the Surface Water Outfall Investigation were addressed.

Department of the Army's Response: The California Environmental Quality Act (CEQA) is a set of procedures to be followed by the State in its exercise of discretionary approval authority. With the exception of Public Resources Code section 21002, CEQA is comprised of procedural, as opposed to substantive, requirements. Although the State is not exercising its discretionary approval authority in the context of this ROD, it would be required to follow Public Resources Code section 21002, which sets out the State's policy in selecting between or among alternative remedies, in any case where it does exercise such authority. The Congress intended that the federal lead agency follow all State substantive requirements that are

more stringent than federal requirements. The Army and EPA conclude that Public Resources Code section 21002 is not an applicable requirement. The parties to the ROD believe that Public Resources Code section 21002 has been complied with.

The State's alleged failure to comply with Public Resources Code section 21101 does not affect the validity of the Army's actions, since it is the State, and not the federal government, that is obligated to undertake a certain action under this State law. The intent of section 21101 is to ensure that the State give the same kind of consideration to a federal project that it would give to a State project. To the extent that the information contemplated by section 21101 has already been provided by the State to the Army in the course of this cleanup, there is no need for the State to repeat it in its official comments.

The DTSC and California Fish and Game concur with the Ecological Risk Assessment (ERA) for Sites 16 and 17. The DTSC agrees with the Army that Site 25 requires no further action as stated in the Proposed Plan, and Site 33 will be deed restricted for other than residential type uses. Comments from the regulatory agencies on these sites are being addressed in the draft final versions of the Site Characterization reports.

3.3.4 Remaining Concerns

- Several citizens expressed concern that the Proposed Plan could not be approved until the OU 2 ROD was amended to address designation of the landfill as a CAMU for soil excavated from the RI sites, as well as consolidation of soil from Area A.

Department of the Army's Response: A ROD amendment is required when the scope, performance, or cost of a remedy fundamentally changes. Use of excavated soil from the RI sites and Area A as foundation layer material in the OU 2 landfill and its designation as a CAMU does not fundamentally change the remedy selected in the OU 2 ROD; therefore, a ROD amendment is not necessary. These modifications to the OU 2 ROD were addressed in: (1) an *Explanation of Significant Differences, Area A, Operable Unit 2 Landfill* (August, 1996), (2) a *Remediation Waste Consolidation Fact Sheet* (October, 1996), and (3) an *Explanation of Significant Differences (ESD) Consolidation of Remediation Waste at a Corrective Action Management Unit (CAMU), Operable Unit 2 Landfill* (November, 1996).

In addition, a public meeting was held on October 29, 1996 regarding waste consolidation in the CAMU, and public comments were accepted from October 8 through November 8, 1996.

- One citizen suggested it would be useful to overlay the RI sites on a land use or reuse plan map for the FORA jurisdiction.

Department of the Army's Response: FORA has this type of map available for public review. Reuse plans have been finalized and were considered in the Proposed Plan and ROD.

4.0 REFERENCES

Agency for Toxic Substances and Disease Registry (ATSDR), 1993. *Toxicological Profile for Lead*. U.S. Department of Health and Human Services. April.

Centers for Disease Control (CDC), 1991. *Healthy People 2000: National Health Promotion and Disease Prevention Objectives*. DHHS Publication No. PHS 921-50212.

Harding Lawson Associates (HLA), 1993. *Interim Action Excavations are Proposed for the Cleanup of Selected Areas at Fort Ord, California*. November.

_____, 1994a. *Interim Action Record of Decision, Contaminated Surface Soil Remediation, Fort Ord, California*. February.

_____, 1994b. *Draft Final Technical Memorandum, Preliminary Remediation Goals, Fort Ord, California*. June.

_____, 1994c. *No Action Proposed Plan for Selected Areas at Fort Ord, California*. August.

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

_____, 1995b. *Site Analytical Report, Sites 2 and 12 Groundwater, Fort Ord, California*. December.

_____, 1996a. *U.S. Army Proposes Cleanup Plan For Remedial Investigation Sites at Fort Ord, California*. May.

_____, 1996b. *U.S. Army Proposes Cleanup Plan to Address Human Health at Site 3 Beach Trainfire Ranges, Fort Ord, California*. May.

U.S. Army Corps of Engineers (COE), Sacramento District, 1994. *Installation-Wide Multispecies Habitat Management Plan*. Technical Assistance from Jones & Stokes Associates, Inc. February.

TABLES

**Table 1. Chemicals of Concern and Remediation Goals
Record of Decision
Remedial Investigation Sites
Fort Ord, California**

| Chemical of Concern | Media | Soil Cleanup Level (mg/kg) | Aquifer Cleanup Level (µg/l) | Federal MCL (µg/l) | State MCL (µg/l) | Discharge Limit for Treated Water (µg/l) ³ |
|----------------------------------|-------------|-------------------------------|---------------------------------|-----------------------|---------------------|--|
| <u>Site 2/12</u> | | | | | | |
| TPH | Soil | 500 ¹ | -- | -- | -- | -- |
| 1,2-Dichloroethane | Groundwater | -- | 0.5 | 5.0 | 0.5 | 0.5 |
| 1,3-Dichloropropene ^a | Groundwater | -- | 0.5 | -- | 0.5 | 0.5 |
| cis-1,2-Dichloroethene | Groundwater | -- | 6.0 | 70 | 6.0 | 0.5 |
| Chloroform | Groundwater | -- | 2.0 | 100 | 100 | 0.5 |
| Tetrachloroethene | Groundwater | -- | 3.0 | 5.0 | 5.0 | 0.5 |
| Trichloroethene | Groundwater | -- | 5.0 | 5.0 | 5.0 | 0.5 |
| 1,1-Dichloroethene | Groundwater | -- | 6.0 | 7.0 | 6.0 | 0.5 |
| Vinyl Chloride | Groundwater | -- | 0.1 | 2.0 | 0.5 | 0.1 |
| <u>Site 16/17</u> | | | | | | |
| TPH | Soil | 500 ¹ | -- | -- | -- | -- |
| <u>Site 31</u> | | | | | | |
| Lead | Soil | 1,860 ² | -- | -- | -- | -- |
| <u>Site 39</u> | | | | | | |
| TPH | Soil | 500 ¹ | -- | -- | -- | -- |
| Lead | Soil | 1,860 ² | -- | -- | -- | -- |
| RDX | Soil | 0.5 ² | -- | -- | -- | -- |
| Beryllium | Soil | 2.8 ² | -- | -- | -- | -- |

a (total).

1 (HLA, 1994b).

2 (HLA, 1995a).

3 Discharge to areas overlying the contaminated groundwater plume need only meet aquifer cleanup levels. All limits are laboratory detection limits.

mg/kg milligrams per kilogram.

MCL Maximum Contaminant Level.

µg/l micrograms per liter.

TPH Total Petroleum Hydrocarbons.

RDX Cyclotrimethylenetrinitramine.

Table 2. Summary of Remedial Alternatives Evaluation - Sites 2 and 12
RI Sites Record of Decision
Fort Ord, California

| Alternative | EPA Evaluation Criteria | | | | | | | |
|--|--------------------------|-------------------------|--|---|-----------------------|--|--|-------------|
| | Short-Term Effectiveness | Long-Term Effectiveness | Reduction of Toxicity, Mobility, and Volume (T, M, V) Through Treatment | Implementability | Compliance with ARARs | Overall Protection of Human Health and the Environment | Regulatory Agency and Community Acceptance | NPV Cost |
| <u>Alternative 1</u> No Action | Not effective | Not effective | No active reduction of T, M, or V for groundwater or soil | Easy to implement | No | Not protective | Likely not acceptable | \$1,838,000 |
| <u>Alternative 2</u> Groundwater: Extraction and POTW Discharge Soil: Capping and Deed Restrictions for SRUs 1 and 2. Excavation. Placement at OU2 Landfill for SRU3 | Effective | Effective | Groundwater: Reduction of T, M, and V Soil: Reduction of M through capping. | Implementable Capping requires deed restrictions and maintenance | Yes | Protective | To be determined | \$8,900,000 |

**Table 2. Summary of Remedial Alternatives Evaluation - Sites 2 and 12
RI Sites Record of Decision
Fort Ord, California**

| Alternative | EPA Evaluation Criteria | | | | | | | |
|---|--------------------------|-------------------------|---|------------------|-----------------------|--|--|---------------------------|
| | Short-Term Effectiveness | Long-Term Effectiveness | Reduction of Toxicity, Mobility, and Volume (T, M, V) Through Treatment | Implementability | Compliance with ARARs | Overall Protection of Human Health and the Environment | Regulatory Agency and Community Acceptance | NPV Cost |
| <u>Alternative 3</u> <u>Groundwater:</u> Extraction, Treatment, Reuse, or Injection <u>Soil:</u> Capping, Deed Restrictions for SRU 1. Excavation and Placement at OU2 Landfill for SRUs 2 and 3. | Effective | Effective | Groundwater: Reduction of T, M, and V Soil: Reduction of M and placement at OU2 landfill for SRUs 2 and 3. | Implementable | Yes | Protective | To be determined | \$7,359,000 - \$8,656,000 |

Table 2. Summary of Remedial Alternatives Evaluation - Sites 2 and 12
RI Sites Record of Decision
Fort Ord, California

| Alternative | EPA Evaluation Criteria | | | | | | | |
|--|--------------------------|-------------------------|---|------------------|-----------------------|--|--|---------------------------|
| | Short-Term Effectiveness | Long-Term Effectiveness | Reduction of Toxicity, Mobility, and Volume (T, M, V) Through Treatment | Implementability | Compliance with ARARs | Overall Protection of Human Health and the Environment | Regulatory Agency and Community Acceptance | NPV Cost |
| <u>Alternative 4</u> <u>Groundwater:</u> Extraction, Treatment, Reuse, or Injection <u>Soil:</u> Excavation and Placement at OU 2 Landfill for SRUs 1, 2, and 3. | Effective | Effective | Groundwater: Reduction of T, M, and V Soil: Reduction of M. | Implementable | Yes | Protective | To be determined | \$7,711,000 - \$9,009,000 |

| | |
|-------|---|
| ARARs | Applicable of relevant and appropriate requirements |
| NPV | Net Present Value |
| SRU | Soil Remedial Unit |

Table 3. Summary of Remedial Alternatives Evaluation - Sites 16 and 17
RI Sites Record of Decision
Fort Ord, California

| Alternative | EPA Evaluation Criteria | | | | | | | |
|--|--------------------------|-------------------------|---|-------------------|-----------------------|--|--|-------------|
| | Short-Term Effectiveness | Long-Term Effectiveness | Reduction of Toxicity, Mobility, and Volume (T, M, V) Through Treatment | Implementability | Compliance with ARARs | Overall Protection of Human Health and the Environment | Regulatory Agency and Community Acceptance | NPV Cost |
| <u>Alternative 1</u> No Action (Groundwater Monitoring) | Effective | Not effective | No active reduction of T, M, and V | Easy to implement | No | Not protective | Likely not acceptable | \$774,000 |
| <u>Alternative 2</u> Capping of SRUs | Effective | Effective | Reduces M, but not T or V | Implementable | Yes | Protective of groundwater and human health | To be determined | \$1,804,000 |
| <u>Alternative 3</u> Excavation, Onsite Treatment at FOSTA, and Reuse or Placement at OU 2 Landfill for SRUs 1 and 2. Consolidation of Debris into Site 17 Disposal Area. | Effective | Effective | Reduces T, M, and V of soil. | Implementable | Yes | Protective of groundwater and human health | To be determined | \$1,604,000 |
| <u>Alternative 4</u> Excavations and Placement at OU 2 Landfill for SRUs . | Effective | Effective | Reduces M, but not T or V. | Implementable | Yes | Protective of groundwater and human health | To be determined | \$5,158,000 |

ARARs Applicable or relevant and appropriate requirements
NPV Net Present Value
SRU Soil Remedial Unit

Table 4. Summary of Remedial Alternatives Evaluation - Site 31
RI Sites Record of Decision
Fort Ord, California

| Alternative | EPA Evaluation Criteria | | | | | | | |
|--|--------------------------|---|---|-------------------|--|--|--|-----------|
| | Short-Term Effectiveness | Long-Term Effectiveness | Reduction of Toxicity, Mobility, and Volume (T, M, V) Through Treatment | Implementability | Compliance with ARARs | Overall Protection of Human Health and the Environment | Regulatory Agency and Community Acceptance | NPV Cost |
| <u>Alternative 1</u> No Action | Not effective | Not effective | No active reduction of T, M, or V | Easy to implement | No | Not protective | Likely not acceptable | \$0 |
| <u>Alternative 2</u> Excavation and Placement at the OU2 Landfill | Effective | Effective | Reduction of M, but not T or V | Implementable | Yes | Protective | To be determined | \$320,000 |
| <u>Alternative 3</u> Excavation and Consolidation in an Onsite Waste Management Unit, Deed Restrictions | Effective | Effective; however, contaminants above TCLs would remain onsite | Reduction of M, but not T or V | Implementable | Requires designation of onsite waste management unit | Protective | To be determined | \$445,000 |
| <u>Alternative 4</u> Excavation and Offsite Disposal at a Landfill | Effective | Effective | Reduction of M, but not T or V | Implementable | Yes | Protective | To be determined | \$335,000 |

ARARs
NPV

Applicable or relevant and appropriate requirements
Net Present Value

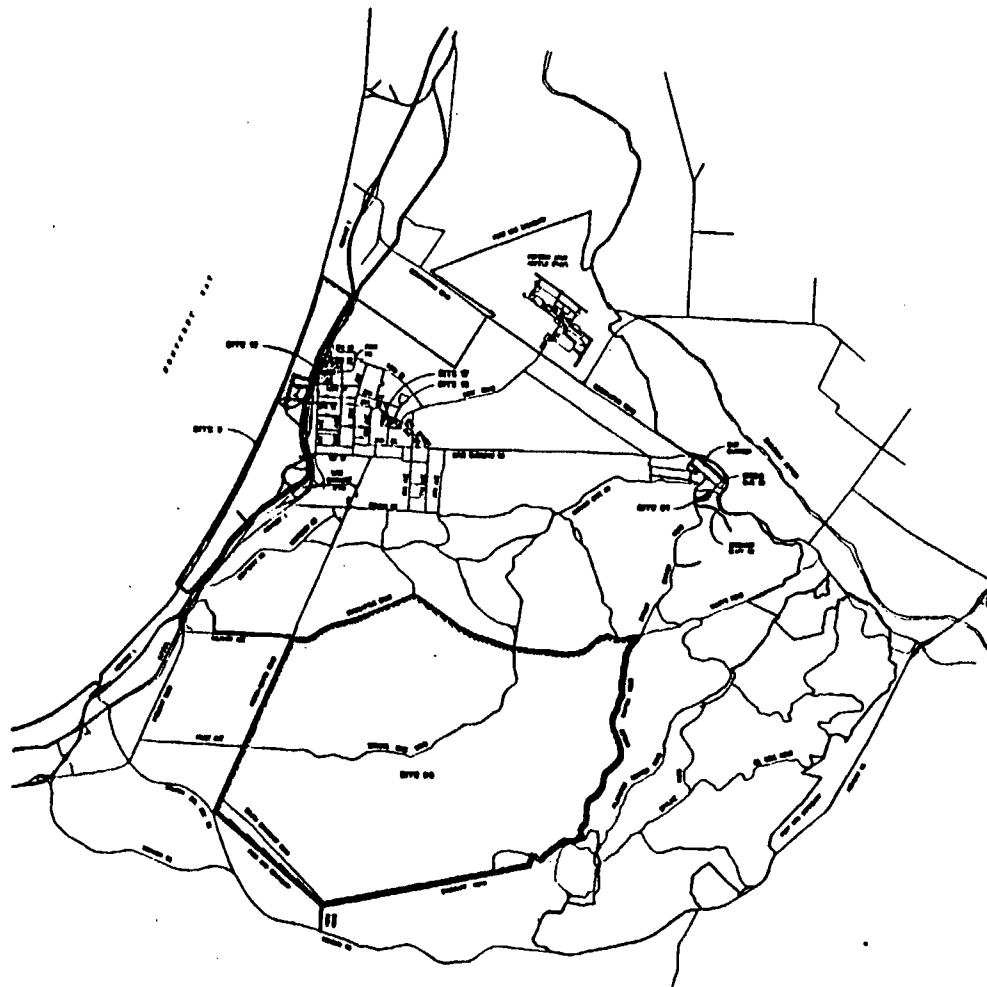
Table 5. Summary of Remedial Alternatives Evaluation - Site 39
RI Sites Record of Decision
Fort Ord, California

| Alternative | EPA Evaluation Criteria | | | | | | | |
|---|--------------------------|-------------------------|---|-------------------|-----------------------|--|--|-------------|
| | Short-Term Effectiveness | Long-Term Effectiveness | Reduction of Toxicity, Mobility, and Volume (T, M, V) Through Treatment | Implementability | Compliance with ARARs | Overall Protection of Human Health and the Environment | Regulatory Agency and Community Acceptance | NPV Cost |
| <u>Alternative 1</u> No Action | Not effective | Not effective | No active reduction of T, M, or V | Easy to implement | No | Not protective | Likely not acceptable | \$0 |
| <u>Alternative 2</u> Institutional Controls | Effective | Not effective | No active reduction of T, M, or V | Easy to implement | No | Protective | Likely not acceptable | \$122,000 |
| <u>Alternative 3</u> Excavation and Placement at the OU 2 Landfill | Effective | Effective | Reduction of M. but not T or V | Easy to implement | Yes | Protective | Likely acceptable | \$1,184,000 |
| <u>Alternative 4</u> Excavation and Offsite Disposal at a Landfill | Effective | Effective | Reduction of M. but not T or V | Easy to implement | Yes | Protective | Likely acceptable | \$1,293,000 |

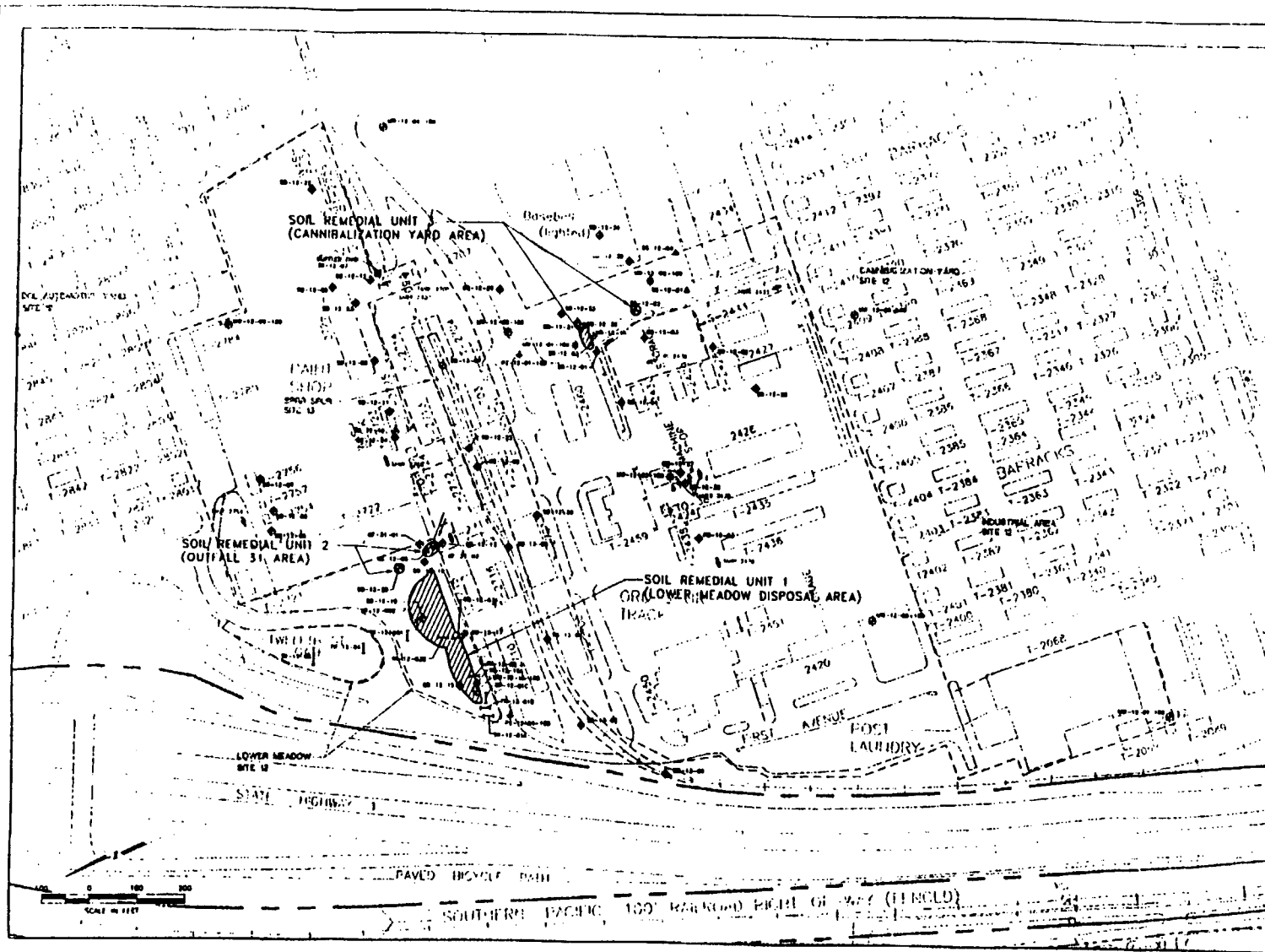
ARARs
NPV

Applicable or relevant and appropriate requirements
Net Present Value

PLATES



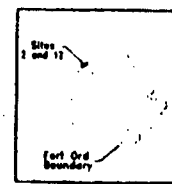
| | | | | | | | | | | | |
|-----|--------|----|--------|---------------|----------|------|----------|--|---|--------------------|------------|
| NO. | DATE | BY | REVIEW | PROJECT | APPROVED | DATE | DRAWN BY | Harding Lawson Associates Engineering and Environmental Services | Basewide RI Sites Record of Decision Fort Ord, California | Site Locations Map | PLAN: 1 |
| 1 | 5/1/86 | | | 5/1/86 07/114 | ALLS | 5/8 | | | | | |



EXPLANATION

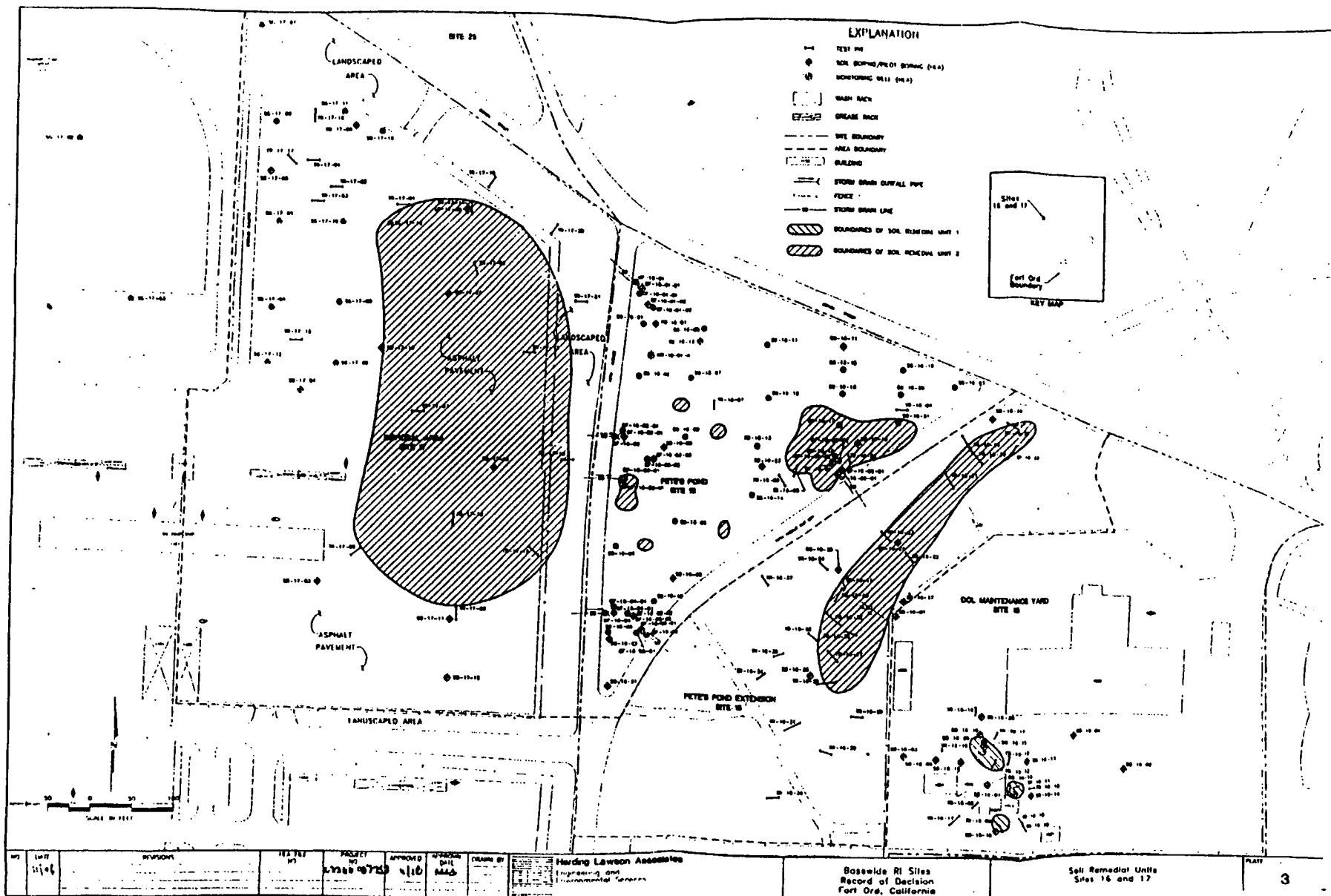
- MONITORING WELL (BY OTHERS)
- MONITORING WELL (BY OTHERS)
- FORMER UNDERGROUND STORAGE TANK
- EXISTING ABOVEGROUND STORAGE TANK
- UNDERGROUND MUFFLER
- WASH RACK
- DR/WATER SEPARATOR
- CURB OF HAZARDOUS WASTE STORAGE AREA
- LIMITS OF REMEDIAL UNITS
- SITE BOUNDARY
- AREA BOUNDARY
- BUILDING
- STORM DRAIN OUTFALL PIPE
- FENCE

NOTE:
LIMITS OF REMEDIAL UNIT 3 ARE
INTERPOLATED FROM DATA
AND EXISTING SITE DATA
ON 1981-82 AND 1984 DATA

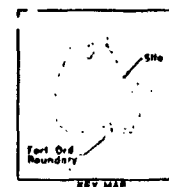
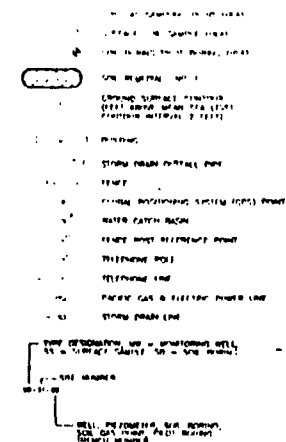


REV 100

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|-----|-------|----------|----|----------|------|-------------|-------------------------------|---|---|---|
| NO. | DATE | REVISION | BY | APPROVED | DATE | DESIGNED BY | ENGINEERING AND CONSULTING | Basewide RI Sites Record of Decision Fort Ord, California | Soil Remedial Units 1, 2 and 3 Site 12 | 2 |
| 1 | 11/16 | | | | | | Harding Lawson Associates | | | |



1991



| | | | | | | | | | |
|---------------|----------|----------|--------------------------|-------------------|---------------|---|--|-----------------------------------|---|
| DATE 11/96 | REVISION | FILE NO. | PROJECT NO. 15000-117 | APPROVED 11/16 | APPROVED DATE | DESIGNED BY Harding Lawson Associates Engineering and Environmental Consulting | ANSWERED AT SITE Record of Decision Fort Ord, California | SOLD REMEDIATED UNIT 1 Site 31 | 4 |
|---------------|----------|----------|--------------------------|-------------------|---------------|---|--|-----------------------------------|---|

[illegible]

**APPENDIX A
APPLICABLE OR RELEVANT AND
APPROPRIATE REQUIREMENTS FOR
THE SELECTED ALTERNATIVES**

**APPENDIX A
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APPENDIX A
APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)
FOR THE SELECTED ALTERNATIVES

The promulgated standards described below are chemical-, location-, and action-specific ARARs for the selected alternatives at Sites 2 and 12, 16 and 17, 31, and 39. ARARs are not presented for the surface water outfalls or Sites 25 and 33, because they are designated Interim Action and No Action Sites, respectively, for which criteria and ARARs were presented in previous documents (HLA, 1993, 1994).

The standards described below are "applicable" or "relevant and appropriate" for soil and groundwater remediation. These standards are designed to be protective of human health and the environment and to be technically achievable with existing analytical and treatment technologies.

A1.0 ARARs FOR SITES 2 AND 12

A1.1 Chemical-Specific ARARs

VOCs regulated by the state and federal government are known to be present in soil and groundwater at Sites 2 and 12. The following chemical-specific ARARs for soil and groundwater remediation have been promulgated for chemicals of concern at this site.

- Waste Classification and Management, Title 23 CCR, Division 3, Chapter 15, Article 2

Excavated soil at Sites 2 and 12 would be classified as a designated waste if samples indicate the soil contains nonhazardous levels of chemicals that may potentially degrade waters of the State. Excavated soil from Sites 2 and 12, which is exempt from these requirements, will be placed at the OU 2 landfill. Chapter 15 will apply to waste placed at the OU 2 landfill.

- Water Quality Control Plan, Central Coast Region, 1994

Portions of the Central Coast Region Water Quality Control Plan are ARARs. The Water Quality Control Plan classifies groundwater based on beneficial uses. Groundwater at

Sites 2 and 12 is considered a potential drinking water source. The Water Quality Control Plan establishes water quality standards including beneficial use designations, water quality objectives to protect these uses, and implementation programs to meet the objectives.

- National Primary Drinking Water Standards, Title 40 Code of Federal Regulations (CFR), Part 141,

Chemical-specific drinking water standards which contain maximum contaminant levels (MCLs), have been promulgated under the Safe Drinking Water Act (SDWA). Drinking water goals (MCLGs) also have been promulgated under the SDWA. MCLGs above zero are considered chemical-specific ARARs under the NCP

(40 CFR 300.430(e)(2)(i)(B)). When MCLGs are equal to zero, the MCL is considered to be a chemical-specific ARAR, instead of the MCLG (40 CFR 300.430(e)(2)(i)(C)). Table 1 lists national primary drinking water standards (MCL) for chemicals detected in groundwater during the RI. With the exceptions of chloroform, tetrachloroethene, and vinyl chloride, MCLs are the cleanup levels for chemicals of concern in the groundwater at Sites 2 and 12.

- State Primary Drinking Water Standards, California Code of Regulations (CCR) Title 22, Chapter 15.

California primary drinking water standards establish enforceable limits for chemicals that may affect public health or the aesthetic qualities of drinking water; however, only those state requirements that are more stringent than federal standards are ARARs and in this case relevant and appropriate. These requirements (state MCLs) are summarized in Table 1.

- Land Disposal Restrictions (LDRs), Title 22 CCR, Chapter 16

LDRs prohibit land disposal of specified untreated hazardous wastes and provides special requirements for handling such wastes. If listed or characteristic hazardous waste exists in carbon treatment vessels used for groundwater treatment, LDRs will apply to their disposition. However, carbon vessels will be regenerated offsite as part of a commercial process that is an industry standard for carbon vessel disposition.

There are no promulgated chemical-specific requirements applicable to soil at Sites 2 and 12.

A1.2 Location-Specific ARARs

Environmentally sensitive locations have been identified within Site 2 by investigations performed during the RI and Ecological Risk Assessment. Certain endangered plant and animal species are present at the site. The following ARARs are potentially applicable to implementation of the groundwater remedy at Site 2.

- Endangered Species Act, Title 16, United States Code 1531 et seq., as promulgated by Title 50, CFR, Part 402, Section 7

The Endangered Species Act requires that any action authorized, funded, or carried out by a Federal agency must ensure that it is not likely to jeopardize the continued existence of any endangered species, or result in the destruction or adverse modification of habitat of such species which is determined to be critical. Fort Ord has consulted with the Fish and Wildlife Service in accordance with the Endangered Species Act. The Habitat Management Plan (HMP) addresses the management during base closure and cleanup.

- Migratory Bird Treaty Act, 16 U.S.C., Section 703, et seq.

The Migratory Bird Treaty Act protects certain migratory birds and their nests or eggs. The HMP for Fort Ord addresses actions to be taken and will be implemented in conjunction with groundwater remediation.

- National Archaeological and Historic Preservation Act, 16, U.S.C., Section 469 et seq., and 36 CFR Part 65

This Act provides for protection of any historically significant artifacts that may be unearthed during remediation activities. Appropriate actions will be taken if any artifacts are unearthed.

- Coastal Zone Management Act, 16 U.S.C. Section 1456 et seq., and California Coastal Act of 1976

These Acts require that activities conducted in the coastal zone (west of Highway 1) be completed in a manner consistent with the state's coastal zone management plan. Site 2 is within this zone, therefore the requirements of that plan apply to implementation of the groundwater remedy.

A1.3 Action-Specific ARARs

Action-specific requirements apply to implementation of remedial activities such as excavation and soil handling, groundwater treatment, and discharge.

- Monterey Bay Unified Air Pollution Control District (MBUAPCD), Regulations II and X, and National Primary and Secondary Air Quality Standards, 40 CFR Part 150.

These regulations and standards establish requirements for sources of air pollution, and the appropriate level of air abatement technology to be applied for specific chemicals that may be generated as toxic air contaminants. The remedial action must meet the substantive requirements of these regulations. During excavation and soil handling, appropriate measures such as dust suppression must be implemented to meet these requirements.

- Standards Applicable to Generators of Hazardous Waste, Title 22 California Code of Regulations (CCR) Chapter 12.

These standards are applicable if hazardous waste is generated at the Site. The substantive portions of this regulation will apply and be complied with.

- State Water Resources Control Board, Resolution No. 88-63

Resolution No. 88-63 specifies that all ground and surface water is an existing or potential source of drinking water unless total dissolved solids (TDS) are greater than 3,000 parts per million (ppm), the well yield is less than 200 gallons per day from a single well, or the groundwater is unreasonable to treat using best management practices or best economically achievable treatment practices. Under this resolution, the upper aquifer at Sites 2 and 12 is a potential drinking source.

- State Water Resources Control Board, Resolution No. 92-49

Resolution 92-49 establishes policies and procedures for the investigation, cleanup, and abatement of waste. In accordance with these requirements, cleanup levels must be set at background levels, or if background levels are not technologically or economically feasible, then at the lowest levels that are achievable. The Army completed an economic and technical feasibility analysis pursuant to 92-49 and has determined that cleanup to the MCLs is reasonable and satisfies this requirement. The soil cleanup levels identified in this ROD are protective of groundwater quality and comply with Resolution 92-49.

- State Water Resources Control Board, Resolution No. 68-16

Resolution No. 68-16 establishes goals for the maintenance of existing groundwater quality. It also requires best practical control technology for discharges to high quality water. Discharge levels were chosen for Sites 2 and 12 considering site-specific conditions, including the contaminants to be discharged and the designated beneficial uses of the receiving water, available treatment technologies, and cost.

- Federal Safe Drinking Water Act, 40 CFR, and California Toxic Injection Well Act, California Health and Safety Code Section 25159.24

40 CFR Part 144 and the California Toxic Injection Well Act prohibit injection of contaminated water into or above a drinking water formation. Injection of treated groundwater into the source aquifer for the purpose of aquifer cleanup is exempted. For Sites 2 and 12, treated groundwater may be injected to the aquifer provided injected groundwater does not contain chemical concentrations above at or below cleanup levels (Table 1).

A2.0 ARARS FOR SITES 16 AND 17

A2.1 Chemical-Specific ARARs

The following chemical-specific ARARs for soil cleanup have been promulgated for chemicals of concern at these sites.

- Waste Classification and Management, Title 23 CCR, Division 3, Chapter 15, Article 2

Excavated soil at Sites 16 and 17 would be classified as a designated waste if samples indicate the soil contains nonhazardous levels of chemicals that may potentially degrade waters of the State. Excavated soil from Sites 16 and 17, which is exempt from these requirements, will be placed at the OU 2 landfill. Chapter 15 will apply to waste placed at the OU 2 landfill.

A2.2 Location-Specific ARARs

No location-specific ARARs have been identified for these sites.

A2.3 Action-Specific ARARs

Action-specific requirements apply to implementation of soil remedial activities such as excavation and soil handling.

- Monterey Bay Unified Air Pollution Control District, Regulations II and X, and National Primary and Secondary Air Quality Standards, 40 CFR Part 150.

These regulations and standards establish requirements for sources of air pollution, and the appropriate level of air abatement technology to be applied for specific chemicals that may be generated as toxic air

contaminants. During excavation and soil handling, appropriate measures such as dust suppression must be implemented to meet these requirements.

- State Water Resources Control Board, Resolution No. 92-49

Resolution 92-49 establishes policies and procedures for the investigation, cleanup, and abatement of waste. In accordance with these requirements, cleanup levels must be set at background levels, or if background levels are not technologically or economically feasible, then at the lowest levels that are achievable. The Army completed an economic and technical feasibility analysis pursuant to Resolution No. 92-49 and has determined that cleanup to the MCLs is reasonable and satisfies this requirement. The soil cleanup levels identified in this ROD are protective of groundwater quality and comply with Resolution No. 92-49

- Medical Waste Management Act, California Health and Safety Code, Division 4, Chapter 6 and Infectious Waste, Title 22 CCR, Article 13.

These regulations cover the handling, treatment, and disposal of medical and infectious wastes. Medical waste was found at Site 16 and 17 during the RI. Medical wastes and infectious wastes encountered during excavation activities must be handled in accordance with these regulations.

A3.0 ARARS FOR SITE 31

A3.1 Chemical-Specific ARARs

Chemicals such as lead that are regulated by the state and federal government at hazardous levels are known to be present at Site 31. The following chemical-specific ARARs for soil cleanup have been promulgated for chemicals of concern at this site.

- Identification and Listing of Hazardous Waste, Title 22, California Code of Regulations (CCR), Division 4.5, Chapter 11.

Excavated lead and DDE/DDT-containing soil at Site 31 would be classified as a characteristic hazardous waste under the Resource Conservation and Recovery Act

(RCRA) if samples indicate the soil contains hazardous levels of these chemicals. Excavated soil from Site 31, which is exempt from these requirements, will be placed at the OU 2 landfill.

- Waste Classification and Management, Title 23 CCR, Division 3, Chapter 15, Article 2

Excavated soil at Site 31 would be classified as a designated waste if samples indicate the soil contains nonhazardous levels of chemicals that may potentially degrade waters of the State. Excavated soil from Site 31, which is exempt from these requirements, will be placed at the OU 2 landfill. Chapter 15 will apply to waste placed at the OU 2 landfill.

A3.2 Location-Specific ARARs

Site 31 contains species categorized as California Species of Special Concern, or as rare in California and elsewhere by the California Native Plant Society. The following ARARs are potentially applicable to soil remediation at Site 31.

Endangered Species Act, Title 16, United States Code 1531 et seq., as promulgated by Title 50, CFR, Part 402, and the California Endangered Species Act, California Fish and Game Code, Section 2050 et seq.

The Endangered Species Acts require action to conserve endangered species and critical habitats upon which endangered species depend. The HMP for Fort Ord addresses actions to be taken and will be implemented in conjunction with soil remediation.

- Migratory Bird Treaty Act, 16 U.S.C., Section 703, et seq.

The Migratory Bird Treaty Act protects certain migratory birds and their nests or eggs. The HMP for Fort Ord addresses actions to be taken and will be implemented in conjunction with soil remediation.

- National Archaeological and Historic Preservation Act, 16, U.S.C., Section 469 et seq., and 36 CFR Part 65

This Act provides for protection of any historically significant artifacts that may be unearthed during remediation activities. Appropriate actions will be taken if any artifacts are unearthed.

- The parties to this ROD do not agree whether California Fish and Game Code Section 3005(a) is an ARAR for Site 31. The State's position is that Fish and Game Code Section 3005(a) is an applicable requirement for the protection of birds and mammals at Site 31. The Army does not agree that Fish and Game Code Section 3005(a) is an applicable requirement for the protection of birds and mammals at Site 31. The State, however, has decided not to dispute this decision because the Army will conduct a post-remediation ecological evaluation for Site 31. If the Parties to this ROD agree that the post-remediation ecological evaluation indicate that the residual levels of chemicals of potential concern (COPCs) are protective of the ecological receptors at Site 31, the remedial actions at Site 31 will be deemed complete. If the post-remediation ecological evaluation indicates that residual levels are not protective of ecological receptors at Site 31, further actions may be necessary.

A3.3 Action-Specific ARARs

Action-specific requirements apply to implementation of soil remedial activities such as excavation and soil handling. The following action-specific requirements are potentially applicable to the soil remedy at Site 31:

- Monterey Bay Unified Air Pollution Control District, Regulations II and X, and National Primary and Secondary Air Quality Standards, 40 CFR Part 150

These regulations and standards establish requirements for sources of air pollution, and the appropriate level of air abatement technology to be applied for specific chemicals that may be generated as toxic air contaminants. During excavation and soil handling, appropriate measures such as dust suppression must be implemented to meet these requirements.

A4.0 ARARS FOR SITE 39

A4.1 Chemical-Specific ARARs

Chemicals such as lead that are regulated by the state and federal government at hazardous levels are known to be present at Site 39. The following chemical-specific ARARs for soil cleanup have been promulgated for chemicals of concern at this site.

- Identification and Listing of Hazardous Waste, Title 22 CCR, Division 4.5, Chapter 11
Excavated soil containing lead, RDX, and beryllium at Site 39 would be classified as a characteristic hazardous waste under RCRA if samples indicate the soil contains hazardous levels of these chemicals. Excavated soil from Site 39, which is exempt from these treatment requirements, will be placed at the OU 2 landfill.
- Waste Classification and Management, Title 23 CCR, Division 3, Chapter 15, Article 2

Excavated soil at Site 39 would be classified as a designated waste if samples indicate the soil contains nonhazardous levels of chemicals that may potentially degrade waters of the State. Excavated soil from Site 39, which is exempt from these requirements, will be placed at the OU 2 landfill. Chapter 15 will apply to waste placed at the OU 2 landfill.

A4.2 Location-Specific ARARs

Site 39 is a critical habitat for endangered species and contains endangered plant and animal species. The following ARARs are potentially applicable to soil remediation at Site 39.

- Endangered Species Act, Title 16, United States Code 1531 et seq., as promulgated by Title 50, CFR, Part 402 and the California Endangered Species Act, California Fish and Game Code, Section 2050 et seq.

The Endangered Species Acts require action to conserve endangered species and critical habitats upon which endangered species depend. The HMP for Fort Ord addresses actions to be taken and will be implemented in conjunction with soil remediation.

- Migratory Bird Treaty Act, 16 U.S.C., Section 703, et seq.

The Migratory Bird Treaty Act protects certain migratory birds and their nests or eggs. The HMP for Fort Ord addresses actions to be taken and will be implemented in conjunction with soil remediation.

- National Archaeological and Historic Preservation Act, 16, U.S.C., Section 469 et seq., and 36 CFR Part 65

This Act provides for protection of any historically significant artifacts that may be unearthed during remediation activities. Appropriate actions will be taken if any artifacts are unearthed.

- The parties to this ROD do not agree whether California Fish and Game Code Section 3005(a) is an ARAR for Site 39. The State's position is that Fish and Game Code Section 3005(a) is an applicable requirement for the protection of birds and mammals at Site 39. The Army does not agree that Fish and Game Code Section 3005(a) is an applicable requirement for the protection of birds and mammals at Site 39. The State, however, has decided not to dispute this decision because the Army will conduct a post-remediation ecological evaluation for Site 39. If the Parties to this ROD agree that the post-remediation ecological evaluation indicates that the residual levels of chemicals of potential concern (COPCs) are protective of the ecological receptors at Site 39, the remedial actions at Site 39 will be deemed complete. If the post-remediation ecological evaluation indicates that residual levels are not protective of ecological receptors at Site 39, further actions may be necessary.

A4.3 Action-Specific ARARs

Action-specific requirements apply to implementation of soil remedial activities such as excavation and soil handling. The following action-specific requirements are potentially applicable to the soil remedy at Site 39:

- Monterey Bay Unified Air Pollution Control District, Regulations II and X, and National Primary and Secondary Air Quality Standards, 40 CFR Part 150

These regulations and standards establish requirements for sources of air pollution, and the appropriate level of air abatement technology to be applied for specific chemicals that may be generated as toxic air contaminants. During excavation and soil handling, appropriate measures such as dust suppression must be implemented to meet these requirements.

APPENDIX B
COMMUNITY RELATIONS ACTIVITIES

APPENDIX B COMMUNITY RELATIONS ACTIVITIES

The following activities have been conducted as part of the Army's public relations and information transfer efforts regarding environmental restoration activities at Fort Ord. Presentations, briefings, and/or tours were given to the following groups or organizations, or the following meetings.

Activity

1996

January 19. *Tour of clean-up activities for Congressman Sam Farr and staff*

January 20. *Orientation and tour for new Restoration Advisory Board (RAB) members*

January 25. *RAB meeting: Sites 16 and 17*

February 22. *RAB meeting: Site 31*

March 28. *RAB meeting: RI sites*

April 25. *RAB meeting: RI sites*

May 1. *Superfund Roundtable for RAB members and general public*

May 6. *Presentation to Cal. State Univ. at Monterey Bay Environmental Chemistry class*

May 8, 12, 17. *Monterey County Herald Notice: Fort Ord public meeting*

May 18. *Proposed Plan public meeting*

May 23. *Tour of clean-up activities for members of Fort Ord Reuse Authority*

May 23. *RAB meeting: RI sites*

June 3-5. *Monterey County Herald Notice: Extension of Comment Period for the Fort Ord Proposed Plans*

June 10. *Training on DOD/EPA Guidance for RAB members*

June 11. *Presentation to Kiwanis Club on Ordnance and Explosive Waste Issues*

1995

January 26. *RAB meeting: RI sites*

February 23. *RAB meeting: RI sites*

February 24. *Presentation to National Oceanographic and Atmospheric Association*

March 23. *RAB meeting: RI sites*

April 27. *RAB meeting: RI sites*

May 9. *Presentation of OU1 and Superfund to Univ. of Calif. at Santa Cruz extension class*

May 24. *Superfund briefing to Fort Ord Reuse Authority staff*

May 25. *RAB meeting: RI sites*

May 30. *Community Outreach Committee of the RAB public workshop*

June 13. *Beach walk with "Coastwalk"*

June 22. *RAB meeting: RI sites*

July 13. *Presentation to Univ. of Calif. at Santa Cruz "Career Seminar"*

July 26. *RAB meeting: RI/FS report*

August 22-27. *Information Booth at Monterey County Fair*

August 24. *RAB meeting: RI sites*

September 7. *Community Outreach Committee of the RAB public meeting in Seaside*

October 3. *Public meeting on OU1*

October 14. *Information Booth at Marina Birthday Celebration*

October 21. *Community Outreach Committee of the RAB public meeting in Salinas*

October 26. *RAB meeting: Sites 2 and 12*

October 28. *Community Outreach Committee of the RAB public meeting in Marina*

November 9. *Presentation to League of Women Voters*

1994

November 27. *Seaside Community Forum with Congressman Farr*

February 7. *RAB/Technical Review Committee (TRC) meeting: RI/FS*

November 30. *RAB meeting: RI Sites*

May 11. *RAB/TRC meeting: RI/FS*

October 20. *RAB/TRC meeting: RI/FS*