OHM Remediation Services Corp.
A Subsidiary of OHM Corporation
1202 Kettner Blvd.
San Diego, California 92101

US Army Corps of Engineers
Omaha District

East Mesa Geothermal Test Facility
El Centro, California

Contract No. DACW45-94-D-0005, Delivery Order No. 0038
OHM Project No. 18904, Revision 0, ~~June 28~~ August 13, 1996

Construction Work Plan

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OHM Project No. 18904
Revision 0
June 28, 1996

OHM Remediation Services Corp.

1202 Kettner Blvd., Suite 3400
San Diego, California 92101

Prepared by:

William D. Olson, P.E.
Technical Lead

Approved by:

John Pepin
Project Manager

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List of Acronyms and Abbreviations

Bechtel	Bechtel Environmental, Inc.
BLM	Bureau of Land Management
CAM	California Assessment Metals
CAO	Cleanup and Abatement Order
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CQC	Construction Quality Control
CRWQCB	Colorado River Basin Regional Water Quality Control Board
DOT	Department of Transportation
FSP	Field Sampling Plan
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NEPA	National Environmental Policy Act
NORM	naturally occurring radioactive material
OHM	OHM Remediation Services Corp.
pci/kg	picocurries per kilogram
PPE	Personal Protective Equipment
RCRA	Resource Conservation and Recovery Act
site	East Mesa Geothermal Test Facility
STLC	Soluble Threshold Limit Concentration
TCLP	Toxicity Characteristic Leaching Procedure
TDS	total dissolved solids
TPH	total petroleum hydrocarbons
TTLC	Total Threshold Limit Concentration
USACE	United States Army Corps of Engineers
USDOE	United States Department of Energy
WET	Waste Extraction Test (California)
yd^3	cubic yards

Section 1
Introduction

This Construction Work Plan identifies the excavation operation and off-site disposal of approximately 12,000 cubic yards (yd^3) of brine residue and contaminated soil located at the East Mesa Geothermal Test Facility near El Centro, California. This work will be performed by OHM Remediation Services Corp. (OHM) under Delivery Order Number 0038 (DO 0038) for the United States Army Corps of Engineers (USACE), Contract Number DACW45-94-D-0005 and the Rapid Response Draft Scope of Service, dated June 14, 1996.

The Colorado River Basin Regional Water Quality Control Board (CRWQCB) issued Cleanup and Abatement Order (CAO) Number 96-023 in 1996 for the remediation of the brine pond at the East Mesa Geothermal Test Facility (Appendix A, Cleanup and Abatement Order). The CAO requested that the United States Department of Energy, Oakland Operations Office (USDOE) submit a Construction Work Plan for remediation of the site to the CRWQCB by July 1, 1996.

The USACE will supervise and document all site activities and remain in close contact with the USDOE's Project Manager. OHM will execute all field activities, collect postexcavation confirmatory soil samples, and document construction activities. OHM will prepare and submit a Final Closure Report to USACE after site restoration work has been completed.

1.1 Site Location and Background

The East Mesa Geothermal Test Facility (site) is located in the Salton Trough (also known as the Coachella and Imperial Valleys) approximately 25 miles east of El Centro, California, 30 miles southeast of the Salton Sea, and 90 miles northwest of the Gulf of California (Figure 1-1, Site Location Map).

The United States Bureau of Reclamation initiated studies of the geothermal resources at the site in 1968 as a potential method of augmenting the Lower Colorado River water supply. Operation of experimental desalting plants at the site began in 1972. The USDOE became the exclusive operator of the site in October 1978. A 6-acre lined brine holding pond was installed in 1972 to temporarily store and evaporate brine blowdown water as well as untreated brines extracted in the geothermal exploration process (Figure 1-2, Site Vicinity Map). An 8-foot high soil berm, protected by a liner, surrounds the pond. Typically, the bottom surface of the pond consists of a 4-inch thick brine layer underlain by a 6 - to 9 - inch protective sand layer, over a 10-mil polyvinyl chloride liner (Bechtel, 1992). It should be noted that a wetlands area is located west of the site.

During site operations from 1972 to 1975, waste brine was discharged into the brine holding pond. The disposal capacity of the pond was inadequate to handle increased site activities; consequently a waste brine injection system was installed in 1976. The brine pond was used intermittently after installation of the injection system, both to supplement the injection system, and to provide for brine disposal when the injection system was inoperable. Geothermal research activities were eventually discontinued by 1987 as commercial-scale geothermal power development matured in the region (Bechtel, 1992).

1.2 Previous Investigations

Previous investigations of the site conducted between 1991 and 1993 were documented in the following reports:

- *Field Investigation Report*, Bechtel Environmental, Inc. (Bechtel), 1991, includes characterization of the brine pond residue and the health and safety monitoring which focused on potential radiological concerns (Bechtel, 1991).
- *Limited Feasibility Study*, Bechtel, 1992, includes development and analysis of four remedial action alternatives for remediation of the brine pond based on the Field Investigation Report (Bechtel, 1992).
- *Site Restoration Phase II Report*, Dames and Moore, 1993, provided the results of Phase I and II site securing, survey, and sampling/analysis activities. This report focused primarily on facilities and equipment not located at the brine pond (Dames and Moore, 1993).

The results of these investigations were used to develop this work plan and are referenced in the following sections.

1.3 Site Characterization

A field investigation was conducted in September 1991 (Bechtel, 1991). The purpose of the field investigation was to characterize the chemical nature of the residues contained in the brine holding pond. One hundred samples were collected at depths ranging from 4 to 8 inches below ground surface within the confines of the pond, and combined into twenty-five composite samples. The 590 by 500 foot pond was divided into 25 cell grids. Within each grid cell, four samples were collected and composited. This technique was repeated throughout the pond, resulting in the total of twenty-seven composite samples, that included two duplicates. In addition, two grab samples were collected from areas that visually appeared different from the bulk of the pond residues (Bechtel, 1991).

The samples were analyzed for a variety of parameters including total metal concentration for the seventeen metals listed under California Code of Regulations (CCR) Title 22. The soluble concentrations for these metals were also assessed using the California Waste Extraction Test (WET). The total metal and soluble metal concentrations were compared with the Total Threshold Limit Concentration (TTLC) and the Soluble Threshold Limit Concentration (STLC) regulatory guidelines (see Attachment 1, Backup Data Tables). Samples were also tested for Resource Conservation and Recovery Act (RCRA) defined hazardous waste characteristics of ignitability, corrosivity, toxicity (Toxicity Characteristic Leaching Procedure [TCLP]), and reactivity. In addition, gross alpha and gross beta radiation counts, as well as oil and grease, total petroleum hydrocarbons (TPH), total dissolved solids (TDS) and the California 96-hour static acute bioassay tests were performed (Bechtel, 1992).

The results of brine pond residue characterization testing indicated the following:

- The brine residue is not a RCRA defined hazardous waste based on characteristics of ignitability, corrosivity, toxicity, and reactivity.
- The brine residue is not a California defined hazardous waste based on TTLC and California 96-hour static acute bioassay tests. STLC analytical results indicated soluble concentrations of the 17 CCR Title 22 metals were below regulatory limits, except for arsenic.
- Soluble arsenic was detected at or above the California hazardous waste regulatory limit of 5.0 milligrams per liter (mg/L) in samples collected from grid cells A5, C4, and C5, presented in Attachment 1 (Bechtel, 1991).
- TPH (EPA Method 418.1) and oil and grease (EPA Method 413.2) concentrations (less than 67 and 80 milligrams per kilogram [mg/kg], respectively) are below typical California soil cleanup levels of 100 to 1,000 mg/kg.
- TDS concentration of brine residue is approximately 16,000 mg/L (Bechtel, 1992).

Low levels of naturally occurring radioactive material (NORM) was identified during radiological testing conducted for previous activities at the site. The maximum NORM levels of 180,000 picocurries per kilogram (pci/kg) total alpha and 170,000 pci/kg total beta in the brine pond (Attachment 1) are typical for a geothermal facility (Bechtel, 1992). There currently are no federal or California hazardous waste regulations specifically for the control of NORM (US Department of Transportation [DOT] Hazardous Material Transportation regulations [49 Code of Federal Regulations (CFR) 171-78] exempt waste below 2,000,000 pci/kg NORM [Underhill, 1996]).

1.4 Project Objectives and Cleanup Criteria

The primary objective of the cleanup project is to remediate the brine holding pond at the site in accordance with the CAO. Based on the CAO and the direction provided by the USACE, the cleanup objective is to remove the brine pond wastes (i.e., brine residue, protective sand layer, and the liner) for disposal at an approved offsite facility.

Quantitative cleanup criteria have not been established for the subgrade soil below the pond liner. Therefore, the cleanup criteria will be defined as the removal of the brine residue and the liner, thereby eliminating the potential threat to the ground water beneath the site. As part of the remediation effort, a minor amount of subgrade soil (i.e., below the liner) may be removed and disposed of.

Pursuant to successfully completing the remediation and complying with the project scope of work provided by the USACE, this work plan addresses the following objectives:

- Obtain CRWQCB acceptance of the proposed work plan
- Restoration of the brine pond and disturbed areas
- Obtain CRWQCB acceptance of the work and closure plans.

1.5 Available Technologies

The following four alternatives were developed and evaluated in the Limited Feasibility Study (Bechtel, 1992) for achieving closure of the brine pond:

- Alternative 1: No action
- Alternative 2: Capping of residues in-place using soil berm material only
- Alternative 3A: On-site containment with a landfill type cap
- Alternative 3B: Closure cell, on-site containment with a landfill type liner and cap
- Alternative 4: Excavation and Off-site disposal of brine material

A Comparative Analysis of Alternatives summary table is included in Attachment 1. Alternative 4 - Excavation and off-site disposal of the brine pond waste was recommended for implementation based primarily on site closure objectives and cost.

1.6 Scope of Work

Proposed activities required to achieve the project objective include the following:

- Develop a work plan, health and safety plan, and related attachments pursuant to project scope of work and obtain USDOE and CRWQCB approval.
- Obtain Free-Use Permit for use of borrow material from Bureau of Land Management (BLM).
- Provide site security of the remediation/construction area.
- Improve access road to the pond area.
- Demolish, remove and dispose of the concrete inlet/outlet structure (north side of pond).
- Excavate brine residue and contaminated soil (approximately 12,000 yd^3) and remove liner from brine pond.
- Transport and dispose of impacted soil and liner from the brine pond at an approved off-site disposal facility.
- Perform confirmatory soil sampling and analysis of excavation cavity pursuant to USACE requirements.
- Backfill brine pond to grade and restore disturbed surfaces to "natural" condition.
- Import fill soil from BLM borrow source, as needed, to restore the site to meet the grade of the surrounding area.
- Prepare Closure Report and obtain concurrence from CRWQCB.

Section 2
Project Planning and Management

2.1 Project Organization and Personnel

An organizational chart for this project is presented as Figure 2-1, Project Organization Chart. The following individuals will serve as contacts for this project:

• USDOE Project Manager:	Hemant Patel	(510) 637-1568
• USDOE HQ (POC):	Rod Cummings	(301) 903-7606
• USACE Project Manager:	Andrew Winslow	(402) 293-2532
• USACE Construction Rep.:	Steve Dawson	(402) 293-2523
• BLM Field Engineer:	Larry Caffey	(619) 337-4425
• OHM Program Manager:	John Hitchings	(419) 424-4919
• OHM Project Manager:	John Pepin	(619) 239-1690 ext. 123
• OHM Manager of Health and Safety:	Roger Margotto	(619) 239-1690 ext. 111
• OHM Site Superintendent:	Ed Hueston	(619) 239-1690

2.2 Schedule

Field mobilization will be initiated upon approval of preconstruction submittals by USACE and completion of the preconstruction meeting. The proposed project schedule is presented in Figure 2-2, Project Schedule.

2.3 Cost Estimate

The cost estimate for this project will be presented to the USACE under a separate submittal.

2.4 Permitting

Other than the Free-Use Permit for the borrow material, no permits are required for the project based on discussions with the following regulatory agencies:

- Colorado River Basin Regional Water Quality Board
- Imperial County Planning Department
- Imperial County Public Works Department
- Imperial County Air Pollution Control District
- Imperial County Solid Waste Local Enforcement Agency

The Free-Use Permit, issued by BLM, is required for use of any fill material obtained from the nearby borrow pit.

National Environmental Policy Act (NEPA) issues relevant to the proposed remediation were addressed in USDOE memorandum dated December 1, 1995, and included as Appendix B, NEPA Exclusion. The document indicates that the proposed removal action was categorically excluded from further NEPA review and documentation. The document further indicates that the proposed action does not threaten a violation of applicable statutory, regulatory, or permit requirements or USDOE Orders. The Categorical Exclusion applied is 10 CFR 1021, Subpart D, Appendix B 6.1, for removal actions under CERCLA and removal-type actions similar in scope under RCRA and other authorities including treatment, recovery, storage, or disposal of wastes at existing facilities currently handling the type of waste involved in the removal action (Bechtel, 1992).

2.5 Health and Safety

The site specific Health and Safety Plan, Appendix C, includes the following:

- Introduction identifying contaminants of concern
- Hazard and risk analysis
- Accident prevention plan
- Staff organization, qualifications, and responsibilities
- Training requirements
- Personal protective equipment (PPE)
- Medical surveillance
- Exposure and air monitoring
- Heat stress
- Standard operating procedures, engineering controls, and work practices
- Site control
- Personal hygiene and decontamination
- Equipment decontamination
- Emergency equipment and first aid requirements
- Emergency response and contingency procedures

2.6 Construction Quality Control

The site specific Construction Quality Control Plan (CQCP), Appendix D, includes the following:

- Program
- Personnel training and qualification

- Quality improvement
- Documents and records
- Work process
- Design
- Procurement
- Inspection and testing
- Management assessment
- Independent assessment

Section 3
Field Activities

This section discusses the field activities involved in executing the project work. The preconstruction conference, site mobilization, site setup, excavation, sampling, and backfilling/restoration activities are presented in this section. Figure 3-1, Site Plan and Proposed Operation Plan, present a conceptual layout of the site.

3.1 Preconstruction Conference

Prior to commencing field activities, a preconstruction meeting will be held on site with the USACE Representative, BLM and others as deemed necessary by the USACE Representative. The meeting will be held to discuss the field activities and execution of the project. The location of equipment laydown, storage area, and haul roads will also be identified. Major subcontractors may be requested to attend this meeting. Appropriate notifications required to commence work will be verified with the USACE Representative, and site protocol as applicable to the work will also be discussed.

3.2 Mobilization

This task will involve mobilization of personnel and construction equipment to the site and setup of the temporary field trailer.

3.2.1 Personnel

OHM will mobilize the following personnel:

- 1 Site Superintendent
- 1 Site CQC Officer
- 1 Project Accountant
- 1 Field Engineer / Site Safety Officer
- 1 Team Leader
- 3 Equipment Operators
- 4 Truck Drivers
- 4 Recovery Technicians

3.2.2 Equipment

OHM will mobilize the following equipment:

- 1 Scraper
- 1 Dozer
- 1 Loader
- 1 Excavator

- 4 Water Trucks, or 3 Water Trucks and 1 Water Wagon
- Miscellaneous Support Equipment (as required)

3.3 Temporary Facilities and Site Setup

Temporary facilities and utilities will be mobilized to support the field activities. A field office trailer will be setup and equipped with electricity, air conditioning, standard office furniture, and a copier. Due to the estimated duration of the project and location of the site, a mobile telephone service will be used and potable drinking water will be provided in 5 gallon bottles. No facsimile machine will be available at the site. Electrical power will be obtained from the Ormesa facility or provided by a generator. Construction water will either be trucked to the site from the Imperial Water District's irrigation canal or obtained from a pipeline that supplies irrigation water to the Ormesa facility.

The development of temporary facilities also includes setup of portable restrooms/wash facilities, water storage ponds, soil stockpile area, an equipment decontamination area, equipment storage area, ingress and egress pathway for vehicles, and the erection of a site access gate with appropriate project signs indicating removal work being conducted. Figure 3-1, shows the proposed site temporary haul roads that will be constructed using standard road base (gravel) material.

3.3.1 Site Preparation

Site Preparation will consist of:

- Implementing site security, health and safety procedures, and dust control activities
- Obtain a Free-Use Permit for the borrow material
- Erection of temporary gates and signage
- Establishing temporary haul roads (i.e., gravel surface) and staging areas
- Erecting two 50,000-gallon temporary water storage ponds and a 10,000-gallon water tank
- Identifying the boundary of the "high arsenic level areas" grids

3.3.2 Decontamination Pad

A temporary equipment decontamination area, as shown on Figure 3-1, will be set up between the construction/support area and the exclusion zone. The exclusion zone will encompass both the excavation area and any contaminated soil stockpile area. The boundary of the exclusion zone will be the top of the brine pond perimeter berm. The decontamination area will consist of a sandbag bermed and sloped pad underlain by pea gravel, lined with 10-mil polyethylene or equal, with a small sump area and a pump. All equipment and vehicles that come in contact with contaminated soil will be decontaminated prior to being released from the exclusion zone. Dry brushing or wiping will also be used to minimize the volume of water requiring treatment and or disposal. Pressure washing may be used if needed. Decontamination will proceed until all soil and staining is removed from the vehicle

or equipment. Water from the decontamination station will be allowed to evaporate within the decontamination area. The decontamination area will be sized in the field based on types and sizes of field equipment used in the operation.

Personnel who enter the exclusion zone on foot or leave their vehicles or equipment while in the exclusion zone will be required to undergo personal decontamination procedures at the decontamination area. Personnel will undergo a sequential decontamination process prior to exiting the exclusion zone. This process is further described in the Site Specific Health and Safety Plan presented in Appendix C.

3.3.3 Site Survey

Surveying will be performed prior to starting the field work and at the completion of excavation activities to locate confirmation samples for as-built documentation and to provide grade elevation for restoration of the site. In addition, temporary benchmarks, as shown on Figure 3-1, will be established around and within the basins. The confirmation sampling grid (Figure 3-2, Proposed Confirmation Sampling Plan) will also be established for the brine pond. All surveying will be performed by or under direction of a California-licensed land surveyor. The surveyor will keep all field notes in a manner consistent with Standard Engineering Practice. Construction survey and staking will be completed during the execution of the work to identify the progress of the excavation activities. Survey work will provide, at a minimum, the following information:

- Horizontal locations shall be established using Third-order, Class I accuracy and tied to the State Plane Coordinate System.
- Vertical control points shall be established using Third-order, Class I accuracy and based on the North American Datum, 1983, Geodetic Reference System of 1980 at mean sea level.

3.3.4 Dust Control

Dust control monitoring will be initiated at the beginning of the project (site mobilization) and continue during all phases of construction activities. The dust control measures will be implemented when OHM and USACE determine it necessary. As a minimum, dust control measures may include the following:

- Apply water to access and haul roads (i.e., within and outside the exclusion zone)
- Apply water to working surface areas and soil stockpiles
- Cover all working surfaces and contaminated soil stockpiles with plastic sheeting during sustained wind conditions or when directed by USACE representative.

3.3.5 Spill Prevention, Control, and Counter Measures

Excavation and stockpiling of the contaminated material will be conducted within the existing bermed brine pond. The integrity of the perimeter berm will be maintained until removal activities are completed to control potential stormwater run-on or run-off.

Additional spill prevention and control will be implemented in potential heavy rain conditions during excavation activities. A temporary berm/ditch may be installed to separate the contaminated area from clean areas. The berm/ditch will contain potential runoff and prevent runoff from contaminating clean areas. When field activities resume, the temporary berm will be removed to allow excavation work to continue.

3.3.6 Waste Profiling

Based on the requirement of disposal facilities, waste profiling samples will be collected from the brine pond basin. These samples will be obtained and analyzed in accordance with Appendix E, Field Sampling Plan (FSP).

3.4 Excavation

Prior to excavation, the concrete inlet/outlet structure located at the north end of the brine pond will be removed and decontaminated for disposal. Grids will be surveyed or laid out to locate the high arsenic grids C4, A5, and C5. Excavation of the "high arsenic level areas" will be conducted first. These "high arsenic level areas," as shown on Figure 3-1, will be delineated prior to commencing excavation. Excavated material will be stockpiled in the northeastern portion of the basin and resampled in accordance with the FSP, presented in Appendix E, to determine the appropriate disposal requirements.

Following stockpiling of the "high arsenic level" soil, the general removal excavation will be initiated. A combination of a scraper, dozer, and loader equipment will be used to remove approximately 12-inches of contaminated soil above the liner and the liner itself. The excavated soil and liner will be stockpiled in the northern portion of the brine pond. An excavator will be positioned on the top of the berm of the pond, and will load the contaminated soil stockpile into transport trucks located in the contamination reduction zone, along the north berm of the pond. The haul road will allow transport trucks to enter the site, position next to the loading excavator, and exit the site with minimal obstruction.

The excavation operation will begin at the south side of the pond and move northward, toward the contaminated soil stockpile and loading area. As excavation activities approach the north side of the pond, the scraper will be eliminated, and the dozer and loader equipment will complete excavation.

Throughout excavation activities, one water truck will be located within the brine pond to moisture condition the contaminated soil prior to and during excavation. Three additional water trucks may be used to transport water from the nearby irrigation ditch to the temporary storage ponds and to support dust control operations. A water wagon, instead of truck, may be used to control dust on the haul road between the borrow pit and the site.

3.5 Sample Collection

Once the basin has been excavated down to the proposed depth, confirmation samples will be obtained. Locations of samples, collection methods and laboratory analytical procedures are outlined in the site specific Field Sampling Plan presented in Appendix E. Figure 3-2 shows the confirmation sampling grid.

3.6 Backfill/Site Restoration

Upon receipt of confirmation sample analytical results indicating that contaminant levels are within acceptable limits, backfilling activities will commence. Non-contaminated soil from the pond's perimeter berms will be leveled into the excavated area to match existing grade of the surrounding topography. Any additional fill material needed to complete final grading of the site will be imported from a local BLM borrow pit, located approximately 4-miles north of the site. The imported material will consist of native soil similar to soil found at the site. Roadbase, utilized to improve the access road, will be placed in the pond area and covered with native soil.

No compaction requirements are specified for the grading work at the site, based on the guidelines presented during the site walk on June 11, 1996, by the BLM representative. The area is to be restored to a native desert condition and no future construction is planned for the area. However, in order to restore the site and any disturbed areas to a native desert condition, a hummocky surface must be created and general area must be graded to match existing surrounding topography. The hummocky or mounding surface, as shown in Figure 3-3, Restoration Surface Detail, will be created by using an excavator. All restoration activities will be coordinated with the USACE and the BLM representatives. A final survey of site will be performed to document as-built grades and conditions.

As part of the restoration operation, the decontamination area, site trailer and other supporting items will be demobilized, dismantled and removed. All remaining wastes generated during construction activities will be transported off-site and disposed of in accordance with Section 4, Waste Management Plan.

Section 4
Waste Management Plan

The objective of this section is to specify the procedures that will be followed to promptly and economically manage the derived wastes generated by the remedial work. These procedures will include the handling, temporary storage, transportation, and disposal of these wastes in accordance with all applicable federal, state, and local regulations.

OHM will utilize personnel trained in accordance with OSHA and RCRA standards and will receive a briefing of all aspects of the on-site work. This training will include: 40 hour HAZWOPER training (OSHA 1910.120), hazardous waste identification, determination, and management (40 CFR 261, Subpart A, B, C, & D and 40 CFR 268), and where applicable, (40 CFR 262 Subpart A, B, & C, 40 CFR 264.16 & 265.16). Waste will be managed, stored, transported, and disposed of properly. In addition, personnel trained in the identification and management of potentially hazardous waste streams will be used to segregate hazardous and non-hazardous waste streams. This segregation will minimize the generation of hazardous wastes, disposal and storage requirements, and additional costs associated with hazardous wastes transportation and disposal.

4.1 Transportation and Disposal

OHM will use transporters and disposal facilities that are fully licensed and/or permitted, and properly insured. All wastes will be properly stockpiled, or stored on-site pending analytical data and disposal site approval. The data received from the waste profiling analysis reports will be evaluated by the OHM Transportation and Disposal Coordinator who will make recommendations as to the appropriate method of disposal and potential disposal facilities. The Transportation and Disposal Coordinator will prepare Request for Quotations, price schedules, Scope of Work, and Waste Management Plans. Upon evaluation of the price quotations, a subcontractor request will be submitted. The Transportation and Disposal Coordinator will prepare waste profiles for the generator's review and signature and then forward to each disposal facility for acceptance approval. Waste profiles will be based on individual waste stream inventories and waste analytical reports.

The Transportation and Disposal Coordinator will schedule shipments of the wastes after the notice of acceptance. The Transportation and Disposal Coordinator will make every effort to schedule the removal of the materials/wastes during project operations to minimize future mobilization costs.

4.2 Waste Characterization

Transportation and disposal of waste streams will be dependent upon the waste characterization of potential waste streams at the site. Segregation of bulk liquids and containerized wastes streams for hazardous categorization through the use of analytical data would place each waste stream into specific waste characterizations or categories. Table 4-1, Summary of Waste Management, presents waste types and their appropriate storage, shipment and possible disposal facilities.

Waste streams will be reviewed by OHM personnel trained in the identification and management of hazardous and nonhazardous wastes. This review involves examination of laboratory analytical results for comparison with applicable regulatory criteria as defined by RCRA TCLP, State of California TTLC, and State of California STLC procedures.

Table 4-1
Summary of Waste Management

Waste Type	Storage	Method of Disposal	Mode of Shipment	Disposal Facility
Soil				
Nonhazardous	Covered stockpile, roll-off bin	Class I landfill; Arizona Sub-Title "D" landfill	Dumptruck, roll-off bin	Laidlaw Environmental, Westmoreland, CA; Sanifill Inc., Wellton, AZ; Waste Management, Butterfield Station, AZ; or other approved facilities
Hazardous (CA State only)	Covered stockpile, roll-off bin	Class I landfill; Arizona Sub-Title "D" landfill	Dumptruck, roll-off bin	Laidlaw Environmental, Westmoreland, CA; Sanifill Inc., Wellton, AZ; Waste Management, Butterfield Station, AZ; or other approved facilities
Debris (piping, liner, concrete)				
Nonhazardous	Roll-off bin	Class III landfill; salvage yard	Roll-off bin	Local permitted facility
Hazardous (CA State only)	Roll-off bin	Class I landfill; Arizona Sub-Title "D" landfill	Roll-off bin	Laidlaw Environmental, Westmoreland, CA; Sanifill Inc., Wellton, AZ; Waste Management, Butterfield Station, AZ; or other approved facilities
PPE				
Nonhazardous	Roll-off bin	Class III landfill	Roll-off bin	Local permitted facility
Hazardous (CA State only)	Roll-off bin	Class I landfill; Arizona Sub-Title "D" landfill	Roll-off bin	Laidlaw Environmental, Westmoreland, CA; Sanifill Inc., Wellton, AZ; Waste Management, Butterfield Station, AZ; or other approved facilities

PPE - Personal Protective Equipment

4.2.1 Soil

Soil from the remediation excavation will be profiled in place, in accordance with the FSP presented in Appendix E, for off-site disposal. Soil determined to be nonhazardous or hazardous will be transported and disposed at either a Class I facility or other approved permitted facility such as a Arizona Class III Sub-Title "D" landfill. Appropriate DOT labels will also be affixed to containers used to store the hazardous or nonhazardous soils.

4.2.2 Liquid

Waste oil, anti-freeze, and other heavy equipment lubricants that may be generated on-site will either be managed by an approved and licensed outside equipment service subcontractor for proper removal, transportation, and disposal/recycling at an OHM approved facility, or, will be managed by OHM personnel onsite for subsequent transportation and disposal at an OHM approved facility.

The water collected from the bermed decontamination area, if any, will be retained and allowed to evaporate.

4.2.3 Debris

Metal piping, if encountered, and concrete will be segregated and pressure washed to remove potentially impacted soil. The metal debris and concrete will be considered to be nonhazardous waste. This metal debris will be temporarily stored in 20 yd^3 roll-off bin containers and labeled with non-hazardous waste labels. The metal debris will be recycled at a local salvage yard or disposed at a Class III landfill as soon as possible to eliminate the wastestream. The concrete debris will be temporarily stored in 20 yd^3 roll-off bin containers and labeled with non-hazardous waste labels prior to transport and disposal to a Class III landfill.

The liner associated with the brine pond will be considered to be contaminated through contact with the contaminated soil. This liner will removed with the soil for transport and disposal to either a Class I landfill or a Arizona Sub-Title "D" landfill.

4.2.4 Personal Protective Equipment (PPE)

PPE will include tyvek suits, gloves, visqueen, and other equipment used for personal protection. PPE directly exposed to contaminated wastes will be segregated from PPE not directly exposed to the contaminated waste streams. PPE directly exposed to contaminated wastes will either be sampled, at a minimum, for CAM-17 metals by TTLC, or will be inferred to be similarly contaminated by contact with the contaminated waste stream.

PPE considered to be hazardous will be collected in tarped and lined 20 yd^3 roll-off bin containers and labeled with hazardous waste labels prior to transport and disposal at a Class I landfill for micro-encapsulation. PPE determined to be nonhazardous will also be collected in tarped and lined 20 yd^3 roll-off bin containers and labeled with non-hazardous waste labels prior to transport and disposal to an approved and permitted Class III landfill.

4.3 Inventory Control

OHM personnel will place hazardous materials into DOT approved containers, per 49 CFR 173, based on individual hazard classification, i.e. Class 3, Class 9, etc., for each waste stream to ensure compatibility within each container. The Transportation and Disposal Coordinator will maintain a Waste Handling Information Table of all waste streams from generation to disposal or recycled endpoint. The Table will include the following:

- unique waste stream tracking number
- description of the waste stream
- unique container or stockpile suffix number
- quantity
- date of sample
- analytical results and classification
- transportation method and transporter
- disposal method and disposal site
- date manifested

The process of categorizing and inventorying the hazardous materials prior to transportation and disposal ensures the ability to quickly assign a proper shipping name, label, and manifest for each container; information required for transportation per 49 CFR, 172. The categorization and inventory of hazardous materials would be determined by those materials prohibited from landfill disposal as required in 40 CFR 268.42(c)(2).

4.4 Selection of Transporters and Disposal Facilities

OHM personnel will implement selection of transportation and disposal vendors in accordance with OHM's Procurement Policies and Procedures Manual. The Transportation and Disposal Coordinator must approve all purchase order requisitions and vendor scopes of work prior to the solicitation of vendors.

The Transportation and Disposal Coordinator will evaluate vendors and provide a written recommendation using the following criteria:

- pricing
- cost reasonableness
- insurance
- ability to perform the scope of work
- financial stability
- history of successful projects

For the transportation of hazardous materials, transporters will be required to possess the following:

- a valid USDOT RSPA Hazardous Materials Certificate of Registration
- drivers possessing HM181/126F training certificates
- drivers possessing commercial driver's licenses with hazardous materials endorsements

For the transportation of hazardous wastes, transporters will be required to possess the following:

- a valid Acknowledgment of Notification of Regulated Waste Activity form
- USEPA Off-site Disposal Policy approval to check NOV status
- personnel possessing HAZWOPER training certificates

After vendor selection, the vendors will utilize the Transportation and Disposal Coordinator as the sole point of contact to insure compliance with regulation and scope of work requirements.

Potential disposal facilities to be used for this project are:

- Waste Management Technologies - Butterfield Station, Mobile, AZ: waste solids/debris
- Sanifill Inc. - Wellton, AZ: waste solids/debris
- Laidlaw Environmental Services - Westmoreland, CA: waste solids/debris
- Rollins Environmental Services (OPC) - Los Angeles, CA: waste liquids
- Norris Environmental Services - Los Angeles, CA: liquids

Potential transportation facilities to be used for this project are:

- United Pumping - City of Industry, CA: solids, liquids
- Environmental Dynamics - Carson, CA: solids, liquids
- OST Trucks & Cranes - Ventura, CA: solids, liquids
- Bud's Trucking - Lakeside, CA: solids

4.5 Preparation of Analytical and Manifest Package

OHM's Transportation and Disposal Coordinator will complete all necessary shipping papers for this project. This package will include the following:

- hazardous and nonhazardous waste manifests
- hazardous and nonhazardous shipping papers
- waste profile sheet

- land disposal restriction form
- supporting analytical, Material Safety Data Sheet (MSDS), and continuous source data
- transporter permits and certifications
- disposal site permits and certifications

After obtaining USACE approval of the Analytical and Manifest Package, the Transportation and Disposal Coordinator will coordinate with the generator to sign the Analytical Package. The Analytical Package will then be forwarded to the disposal sites. After receiving a written commitment of approval from the disposal site, waste transportation and disposal will be scheduled concurrently. The Transportation and Disposal Coordinator will coordinate with the USACE Representative at least forty-eight (48) hours prior to shipment of the waste streams to sign the Manifest Package.

Upon arrival of the transporter, all packaging and labels will be inspected for integrity. Drivers will sign the Manifest Package and copies will be distributed to the generating activity and project file. Copies of Uniform Hazardous Waste Manifests will be mailed to the Department of Toxic Substance Control (DTSC) as required. The disposal site shall send by facsimile facility signed copies within one (1) business day of receipt and within 35 days of shipment to the Transportation and Disposal Coordinator. Certificates of Disposal/Treatment/Recycle will be mailed to the Transportation and Disposal Coordinator within sixty (60) calendar days of shipment. In the event an exception report becomes necessary, the Transportation and Disposal Coordinator will prepare a draft report and submit it for USACE approval.

The Transportation and Disposal Coordinator will track these milestones on the Transportation and Disposal Tracking Form which will be submitted with the final report.

Section 5
Post Conference and Closure Report

A Post Construction Conference will be held prior to the final inspection of the work to discuss and resolve any construction related issues.

OHM will submit a Draft Closure Report to USACE, USDOE and CRWQCB thirty (30) days after completion of closure activities. The report will contain all original laboratory data sheets, copies of manifests and chain-of-custody forms, drawings depicting the extent of contaminated soils and a description of site activities as they occurred. Confirmation of compliance with all items in this Work Plan and details of modifications to the approved Work Plan will also be included (Bechtel, 1992).

Section 6
References

Bechtel Environmental, Inc. November, 1991. *Field Investigation Report - Field Activities at U.S. Department of Energy's Former Geothermal Test Facility Near El Centro.* Prepared for Department of Energy San Francisco Field Office.

Bechtel Environmental, Inc. August, 1992. *Limited Feasibility Study - Remedial Activities at U.S. Department of Energy's Former Geothermal Test Facility Near El Centro, CA.* Prepared for Department of Energy San Francisco Field Office.

Dames and Moore. June, 1993. *El Centro Geothermal Test Component Facility Site Restoration Phase II Report.* Prepared for Department of Energy Golden Field Office.

Underhill, P. 1996. *Naturally Occurring Radioactive Material Principles and Practices.*