BW-2083A

RCRA Closure Certification Report
DRMO Hazardous Waste Container Storage Unit
Former Fort Ord, California

Prepared for

Department of the Army
Sacramento District Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

HLA Project No. 23366 09823

Valerie Harris, PE
Project Engineer

Gary A. Lieberman
Senior Geologist

December 6, 2000

Harding Lawson Associates
Engineering and Environmental Services
90 Digital Drive
Novato, CA 94949 — (415) 883-0112

RCRA Closure Certification Report
DRMO Hazardous Waste Container Storage Unit
Former Fort Ord, California

HLA Project No. 23366 09823

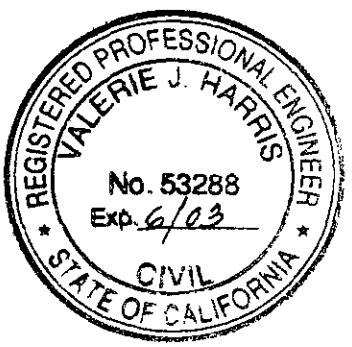
This document was prepared by Harding Lawson Associates (HLA) at the direction of the U.S. Army Corps of Engineers (USACE) for the sole use of the U.S. Army, USACE, and regulatory agencies, the only intended beneficiaries of this work. No other party should rely on the information contained herein without prior written consent of the USACE and U.S. Army. This report and the interpretations, conclusions, and recommendations contained within are based, in part, on information presented in other documents that are cited in the text and listed in the references. Therefore, the report is subject to the limitations and qualifications presented in the referenced documents.

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Valerie Harris, P.E
Project Engineer

1/19/01
Date



CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Valerie Harris, P.E
Project Engineer

12/05/00
Date

Replaced with stamped certified page
Jan 19, 2001

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Kevin M. Rice
Colonel, U.S. Army
Commander

9 Dec 2000
Date

C NTENTS

1.0 INTRODUCTION 1

1.1 Objective and Approach 1
1.2 Report Organization 1

2.0 BACKGROUND 3

2.1 Site Description 3
2.2 Site Usage 3
2.3 Regulatory History 4

3.0 CLOSURE PERFORMANCE STANDARDS (CLEANUP LEVELS) 5

3.1 Soil 5
3.2 Containment Structures 5

4.0 CLOSURE ACTIVITIES AND RESULTS 6

4.1 Personnel 6
4.2 Summary of Closure Activities 7
4.2.1 Soil Excavation 7
4.2.2 Storm Drain System TV/Video Survey and Sampling 8
4.2.3 Sediment Removal and Rinsate Sampling 8
4.3 Sample Data and Analyses 8
4.4 Modifications to Closure Plan 8
4.5 Analytical Results 9
4.5.1 Soil Boring Excavations 9
4.5.2 Storm Drain System Sampling 9
4.5.3 Rinsate and Sediment Disposal Disposition Sampling 9

5.0 SUMMARY AND CONCLUSIONS 12

6.0 REFERENCES 13

TABLES

1 Summary of Organic Analytical Results of Soil and Sediment Samples
2 Summary of Inorganic Analytical Results of Soil and Sediment Samples
3 Summary of Analytical Organic Results of Rinsate Samples
4 Summary of Analytical Inorganic Results of Rinsate Samples
5 DRMO Cleanup Goals
6 Analytical Parameters and Test Methods
7 POTW Acceptance Criteria

PLATES

1 Location Map
2 Site Location Map
3 Site Plan

APPENDIXES

A Field Engineer Observation Reports
B Report for Video Survey of Storm Drain System
C Chain of Custody Forms
D Quality Control Summary Report
E Laboratory Analytical Reports

DISTRIBUTION

1.0 INTRODUCTION

This Closure Certification Report describes the activities conducted for closure of the Hazardous Waste Container Storage Unit at the Defense Reutilization and Marketing Office (DRMO Site) at the former Fort Ord in Monterey County, California. Plate 1 is a map showing the location of the former Fort Ord and the general vicinity of the East Garrison (Plate 2), the area in which the DRMO Site is located. Plate 3 is a site plan map showing the layout of the DRMO Site. The Defense Reutilization and Marketing Office was responsible for the storage and ultimate disposition of all hazardous waste, surplus hazardous materials, and surplus inventory generated at the former Fort Ord. When the base was active, these wastes, materials, and surplus items were also received from other selected installations in the surrounding area for storage and ultimate disposal. The DRMO contracted with a registered hazardous waste hauler through the DRMO headquarters in Battle Creek, Michigan, to transport hazardous waste to a permitted treatment, storage, or disposal facility. Other surplus items were sold at public auction.

Report preparation and closure activities were conducted in accordance with the *Draft Final Closure Plan, DRMO Hazardous Waste Container Storage Unit, Former Fort Ord, California* (*HLA, 1997*).

1.1 Objective and Approach

The principal objective of this closure certification report is to document the clean closure of the DRMO hazardous waste management unit at the former Fort Ord. Clean closure is intended to leave only residual chemical constituents of concern (i.e., residual levels that are less than the appropriate action levels or remediation goals) and stem concerns about human health and future land uses. Clean closure also enables the greatest latitude for future reuse of areas previously affected by historical operations at the Site.

The approach used herein to certify clean closure (i.e., absence of contamination above cleanup or action levels) is to document conformance of closure activities with the activities described in the Draft Final Closure Plan (*HLA, 1997*) and to compare analytical results for the closure samples with closure performance standards as discussed in Section 3.0. These performance standards were developed on a site-specific basis and are summarized in this report.

1.2 Report Organization

Section 2.0 of this report provides a summary of the background information and previous reports for the DRMO Site. The performance standards used to determine attainment of clean closure are described in Section 3.0. The closure activities and a summary of the results are described in Section 4.0. Section 5.0 presents the summary and conclusions, and Section 6.0 presents the references cited in the text. Appendices to this report include supporting information.

As described in the Closure Plan, this closure certification report contains the following:

- Certification by the Army and a registered professional engineer (page iii)
- Description of supervisory personnel involved in physical closure of the unit (Section 4.1)
- Summary of closure activities (Section 4.2)
- Field engineer observation reports (Appendix A)
- Sampling and analytical data (Tables 1 through 4 , Plate 3, and Appendix E)
- Discussion and interpretation of analytical results (Sections 4.0 and 5.0)

This report has been prepared by HLA for the U.S. Army Corp of Engineers (USACE) under

Contract DACA 05-86-C-0241, Modification Number P00192, in accordance with the Supplemental Scope of Work (SSOW) dated August 9, 1994.

2.0 BACKGROUND

This section summarizes background information, including the site description, site usage, and previous site work performed. More detailed background information regarding specific technical issues is provided in other referenced technical documents that have been submitted previously to the California Environmental Protection Agency (Cal EPA) Department of Toxic Substances Control (DTSC). Section 6.0 provides these references.

2.1 Site Description

The DRMO Site is an outdoor facility that includes a fenced, paved area (Plate 3) within a larger scrap yard that was used by the DRMO to store containers of hazardous waste. The Site is approximately 135 by 370 feet. It is divided into eight storage bays that had been used to segregate characteristic waste types including combustible, flammable, combustible and flammable, caustic, oxidizer, acid, toxic, and reactive wastes. Each storage bay is surrounded by an asphalt berm and access to each bay is provided via a sloped ramp. The ground surface of all bays is sealed asphalt pavement.

Each bay contains at least one manually operated rainwater valve that was used to isolate potential spills or releases of materials and prevent mixing of incompatible wastes (Plate 3). During periods of heavy rainfall, the valves were opened to allow uncontaminated stormwater to flow into one of the Site's storm drains, which lead to the basewide storm drain system via the storm drain bypass valve (Plate 3). Stormwater runoff that accumulated within each bay was checked for visual evidence of oil (e.g., surface oil slick) and the field pH was measured. If the runoff was contaminated, the material was then pumped into 55-gallon drums that were sealed, labeled, and stored in the appropriate storage bay until transferred offsite for treatment or disposal as a hazardous waste.

In addition, during loading and unloading operations, the storm drain bypass valve was closed to isolate the entire DRMO storage unit from the basewide storm drain system in the event of an emergency or spill/release.

2.2 Site Usage

The DRMO Site operation began in 1973 for the purpose of storing hazardous materials and vehicles and for use as an equipment maintenance area. Paving of the entire Site with asphalt began in 1976 and was completed in 1978. Hazardous wastes (initially from transformers) were first stored in the area in 1976 as soon as paving was completed in the Flammable Storage Bay. The hazardous waste management mission was assigned to the DRMO in late 1980 and the RCRA facility permit process was initiated in 1981. The entire Flammable Storage Bay was used for hazardous waste storage beginning in 1981. The remainder of the storage bay area was used for storage of excess vehicles and large equipment. In 1985, the storage area was expanded to include the entire area designated on Plate 3. Secondary containment berms and a storm drain bypass valve were installed in 1989 (Plate 3). In November 1994, the DRMO ceased acceptance of new hazardous waste.

The Closure Plan (*HLA, 1997*) presented detailed information regarding the types and quantities of hazardous wastes that had been stored at the DRMO Site. This information included the following:

- A copy of the most recent Hazardous Waste Permit Application, Part A (dated 1994), was provided in Appendix B of the Closure Plan. Pages 6 through 7 of the Part A Application list the U.S. Environmental Protection Agency (USEPA) Waste Code numbers and, where applicable, California Waste Code numbers for hazardous wastes potentially generated, stored, or treated at the former Fort Ord. Hazardous wastes potentially stored at the DRMO Site were

- identified by process code S01 (storage in containers).

- Table 2 of the Closure Plan lists the general types of wastes that were stored within each bay of the DRMO Site. Table 3 of the Closure Plan lists the types and quantities of hazardous wastes that were handled at the DRMO Site, as identified in the 1990 Hazardous Waste Report (also known as the Biennial Report), which was submitted to the U.S. Environmental Protection Agency (USEPA). The 1990 report covers the 1989 calendar year and was representative of the wastes handled at the unit.

2.3 Regulatory History

A Draft Closure Plan was submitted to the U.S. Environmental Protection Agency (USEPA) in October of 1991. It was revised and resubmitted in October 1995. The California Environmental Protection Agency (Cal EPA) Department of Toxic Substances Control (DTSC) subsequently became the lead agency in overseeing closure of these units. The 1997 Closure Plan (*HLA, 1997*) completely replaced the previously submitted plans and presented the information in a format consistent with DTSC requirements.

Because a final Resource Conservation and Recovery Act (RCRA) permit was not issued for this unit, the DRMO Site is being closed as an interim status treatment, storage, and disposal (TSD) facility pursuant to state and federal hazardous waste management programs. The Hazardous Waste Control Law, California Health and Safety Code Chapter 6.5 (HWCL), and Title 22, California Code of Regulations, Division 4.5, Articles 23 through 31 (22 CCR), set forth state requirements for interim status closure activities. Title 40, Code of Federal Regulations, Part 265, Subpart G, sets forth federal requirements for interim status closure activities.

Closure activities have been completed at the DRMO Site. Information related to these activities is described herein. The unit has undergone clean closure; in other words, no hazardous waste remains and soil containing chemicals at concentrations above the performance standards for the site have been excavated, and disposed of at an appropriate offsite facility.

The former Fort Ord no longer operates as a TSD facility (i.e., hazardous waste is no longer stored onsite for more than 90 days or treated or disposed onsite). All hazardous waste is now managed in units separate from those undergoing closure in accordance with generator accumulation requirements in 22 CCR 66262.34. Because the DRMO Site is no longer in operation, no other environmental permits are associated with the former facility. The NPDES (National Pollutant Discharge Elimination System) permit referenced in Section X of the Hazardous Waste Permit Application, Part A (a copy of which is included as Appendix B in the 1997 Closure Plan) is for East Garrison Sewage Treatment Plant (currently active).

3.0 CLOSURE PERFORMANCE STANDARDS (CLEANUP LEVELS)

This section summarizes the closure performance standards (cleanup levels) and criteria for determining the extent of decontamination necessary to satisfy the closure performance standard. The DRMO Site was closed in a manner that:

- Minimizes the need for further maintenance
- Controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated rainfall or runoff, or waste decomposition products to the ground or surface waters or to the atmosphere

3.1 Soil

To meet the closure performance standard for contaminated soil associated with the DRMO Site, cleanup levels are consistent with the Fort Ord-specific Preliminary Remediation Goals (PRGs), which are presented in Table 5. These site-specific PRGs were based on the USEPA Region IX (*USEPA, 1995*) PRGs and the Fort Ord background concentrations for inorganic constituents. Fort Ord background threshold values were used to calculate site-specific PRGs for inorganics during the Basewide Background Soil Investigation *(HLA, 1993b)*. A brief summary of the background investigation is presented below.

A Basewide Background Soil Investigation *(HLA, 1993b)* was conducted to evaluate background soil concentrations for 13 priority pollutant metals. The evaluation consisted of the following:

- Developing risk-based PRGs
- Compiling a dataset representative of background soil conditions
- Comparing the background soil metals concentrations to the PRGs to identify metals with concentrations exceeding the PRGs
- Evaluating the spatial distribution of those metals
- Estimating threshold concentrations for metals with background concentrations exceeding PRGs

PRGs developed for 13 priority pollutant metals are presented in Table 5. The background soil dataset was created by collecting and analyzing 126 soil samples representative of background conditions at Fort Ord. The dataset was compared to the lowest PRGs to identify metals with background concentrations exceeding the lowest PRGs. The comparison identified arsenic, beryllium, and chromium as metals with background concentrations exceeding the most conservative PRGs. Further study revealed that chromium concentrations appear to be controlled by depth and soil-parent material, while arsenic concentrations appear to be controlled by soil-parent material. Site-specific PRGs and background threshold values have been established as part of site characterization activities at the former Fort Ord (*HLA, 1993a, b*).

3.2 Containment Structures

The closure performance standards for containment structures at the DRMO Site (i.e., asphalt lining, berms, and storm drain system) were met by using proper decontamination procedures (as described in Section 7.0 of the Closure Plan [*HLA, 1997*]) and by comparing the final rinsate analytical data to the acceptance criteria set by the Publicly Owned Treatment Works (POTW) that will accept the water for disposal. Table 6 presents the analytical test methods while Table 7 presents the POTW acceptance criteria.

4.0 CLOSURE ACTIVITIES AND RESULTS

This section describes the closure activities conducted at the Site.

4.1 Personnel

Personnel who performed activities associated with closure of the DRMO Hazardous Waste Container Storage Unit include the following:

Organization/Personnel	Responsibility
Contractor: IT Corporation	
Mark Edwards—Site Foreman	Implementation of work plan
Engineer: Harding Lawson Associates, Novato, California	
Valerie Harris, P.E.—Field Engineer	Collection of excavation, sediment, and rinsate samples
Greg McIver—Field Technician	Collection of rinsate samples
Gary A. Lieberman—Task Manager	Coordination and implementation of field program
Henry Lin, P.E.—Project Engineer	Review of storm sewer video and pictures
Debbie Leibensberger—Chemical Data Acquisition Task Manager	Coordination with laboratory and sample documentation
Ed Ticken—Project Manager	Oversight of field program
Implementing Agency: U.S. Department of the Army, Sacramento District Corps of Engineers	
Scott Gable—USACE Engineer	Onsite USACE representative
Mark Wingate—USACE Engineer	Member of technical team responsible for review of project
Jennifer Faler—USACE Project Manager	Oversight of overall program management
Cathy Martin—USACE Chemist	Member of technical team responsible for oversight of project planning; oversight of field work, chemical analysis, and data assessment and interpretation

Organization/Personnel	Responsibility
Subcontractors	
Precision Inc.	Installation of soil borings
Phillips Services Corporation	Video photography of the storm drains and drain inlets

4.2 Summary of Closure Activities

Closure activities consisted of the following activities:

- Soil boring investigation (previously submitted under separate cover [*HLA, 1999a, b*])
- Excavation of soil and subsequent collection and analysis of clearance samples
- Performance of a TV/video survey and collection and analysis of subsurface-soil samples adjacent to the storm drain system (SDS)
- Removal of sediment from the SDS and DRMO surface, decontamination of the SDS pipes and DRMO surface, and collection and analysis of rinsate samples from the SDS and DRMO surface decontamination

4.2.1 Soil Excavation

Total petroleum hydrocarbons such as motor oil (TPHmo) and polychlorinated biphenyls (PCBs) were detected at concentrations above closure performance standards at three areas where results from previous efforts warranted further investigation (surrounding borings SB-DRMO-002, -016 and -018; Plate 3). Consequently, on September 11, 2000, under the supervision of HLA, IT Corporation (IT) excavated approximately 9 cubic yards (9-feet square by 3-feet deep) of soil surrounding these three borings. HLA collected clearance soil samples consisting of four sidewall samples and two floor samples from each excavation. Samples were collected by hand driving a 6-inch-long stainless steel tube directly into the excavation sidewalls and floor. The soil sample tubes were capped with Teflon-lined plastic lids, labeled, stored in an insulated container with ice, and transported under chain-of-custody to the analytical laboratory.

Results of the sampling identified three locations (SB-DRMO-002 east wall and SB-DRMO-016 north wall and north floor) with results still above cleanup goals. These three areas were excavated an additional 3 feet on September 28, 2000, and resampled using protocols discussed above. With the exception of the sample from SB-DRMO-002 east wall that contained PCBs (Aroclor-1254) above PRGs, all results were below cleanup goals. The SB-DRMO-002 east wall was excavated an additional 3 feet on October 13, 2000 and resampled. PCBs were not detected above the cleanup goal. Results of the excavation samples are presented in Table 1 and Appendix E presents the laboratory analytical reports.

The excavations were subsequently backfilled and the areas resurfaced by IT between October 11 and 16, 2000. The soil removed from the excavations was transported to the Operable Unit 2 (OU2) Landfill on October 19, 2000, for use as the foundation layer.

At the request of the USACE, samples of an asphalt layer and a "petroleum smell stained layer" encountered during excavation were also collected for TPH analysis. Results of the sampling indicated that the asphalt contained TPHmo and TPHd at concentrations of 1,490 and 690 milligrams per kilogram (mg/kg) respectively. Results of the analysis on the "petroleum smell stained layer" indicated that TPH concentrations were below 100 mg/kg.

Results of the sampling are also presented in Table 1.

4.2.2 Storm Drain System TV/Video Survey and Sampling

On September 12 and 13, 2000, under the direction of IT, Philip Services Corporation (PSC) conducted a TV/Video Survey of the SDS at the DRMO to evaluate its integrity. After reviewing the results of the survey video and photographs of the SDS, a registered engineer identified several areas with cracks or separations of the pipe. Results of survey and associated still pictures are presented in the PSC report presented as Appendix B. Three locations (41.6 feet from drain inlet [DI] #1 [Sample DI#1-41.6], 12 to 14 feet from DI #1 [Sample DI#1-12–14], and a separated pipe at DI #4 [Sample DI #4]) were selected as representative locations for sampling of native soil outside the SDS to evaluate the extent of any release of chemicals to the subsurface from the SDS. On September 28, 2000, under the direction of HLA, IT excavated soil adjacent to the SDS at the three locations identified for sampling. On October 3, 2000, HLA collected samples from the three locations using a drive sampler equipped with a 6-inch-long stainless steel tube. The soil sample tubes were capped with Teflon-lined plastic lids, labeled, stored in an insulated container with ice, and transported under chain-of-custody to the analytical laboratory. The drive sampler was cleaned between sampling events by washing with phosphate-free detergent followed by a clean water rinse. Samples were analyzed for the compounds specified in the DRMO Closure Plan *(HLA, 1997)* and presented in Table 6. Results of the sampling indicated that various inorganic and organic compounds were detected; however, none of the detected compounds were above the DRMO cleanup goals. Results of the sampling are presented in Tables 1 and 2 and Appendix E presents the laboratory analytical reports.

4.2.3 Sediment Removal and Rinsate Sampling

According to protocols identified in the DRMO Closure Plan *(HLA, 1997)*, IT cleaned out sediment from the storm drain (September 12, 2000) and the surface of the DRMO (October 24, 2000). After completion of sediment removals, these areas were power washed and cleaned and samples of the initial and final rinsate (which was contained and pumped into poly tanks) were collected by HLA. Samples were analyzed for the compounds specified in the DRMO Closure Plan *(HLA, 1997)* and presented in Table 6. In addition, samples of sediment removed from the storm drain and DRMO surface were also collected and analyzed for disposal disposition.

Results from sampling of the storm drain and DRMO surface final rinsate samples indicated that all detected chemicals were below acceptance criteria set by the local POTW. Results of the rinsate samples are presented in Tables 3 and 4. Sediment was taken to the OU2 Landfill on October 19, 2000, for use as landfill cover in accordance with the DRMO Closure Plan *(HLA, 1997)*.

4.3 Sample Data and Analyses

Tables 1 through 4 present a summary of the analytical program for soil, sediment, and rinsate samples collected from the soil boring and storm drain excavations, sediment stockpiles, and poly tanks containing rinsate and Table 6 presents the analytical parameters and test methods. Appendix E presents the Laboratory Analytical Reports; Appendix D presents the Quality Control Summary Report completed for the final samples including soil borings, storm drain excavations, sediment, and rinsate samples.

4.4 Modifications to Closure Plan

No modifications to the Closure Plan were performed.

4.5 Analytical Results

4.5.1 Soil Boring Excavations

Results from the final soil-boring excavation confirmation samples are presented in Table 1. Results were as follows:

- TPH as diesel (TPHd) was detected in samples collected from the DRM-016 boring excavation at concentrations between 5.8 and 42.3 mg/kg
- TPHmo was detected in samples collected from the DRM-016 boring excavation at concentrations between 11.7 and 176 mg/kg
- The PCB compound aroclor-1254 was detected in the sample collected from the DRM-002 boring excavation north wall at a concentration of 136 micrograms per kilogram (µg/kg)

TPHd and TPHmo were not detected in samples collected from the DRM-018 boring excavation.

4.5.2 Storm Drain System Sampling

Results from samples collected from the three locations below the SDS are presented in Tables 1 and 2. Detected organic compounds included the following:

- TPHd detected at concentrations of 6.26 and 9.06 mg/kg in samples from DI#4 and DI#1-41.6 respectively
- TPHmo detected at concentrations of 34.7 and 43.3 mg/kg in samples from DI#4 and DI#1-41.6 respectively
- Oil and grease (O&G) detected at concentrations between 238 and 426 mg/kg
- Total recoverable petroleum hydrocarbons (TRPH) detected at a concentration of 17 mg/kg in the sample from DI#4
- The pesticide compound 4,4'-DDT detected at concentrations of 5.04 and 12.2 µg/kg in samples from DI#4 and DI#1-41.6 respectively

TPH as gasoline (TPHg), benzene, toluene, ethylbenzene, and xylenes (BTEX), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), phenols, and PCBs were not detected in any of the SDS confirmation samples.

Detected inorganic compounds included the following:

- Beryllium detected at concentrations of 0.117 and 0.145 mg/kg in samples from DI#1-12–14 and DI#4 respectively
- Cadmium detected at a concentration of 1.0 mg/kg in the sample from DI#1-41.6
- Chromium detected at concentrations between 1.91 and 10.1 mg/kg
- Copper detected at a concentration of 3.53 mg/kg in the sample from DI#1-12–14
- Lead detected at a concentration of 10.8 mg/kg in the samples from DI#1-12–14 and DI#4
- Mercury detected at concentrations between 0.014 and 0.048 mg/kg
- Nickel detected at concentrations of 4.02 and 5.79 mg/kg in samples from DI#1-12–14 and DI#1-41.6 respectively
- Zinc detected at concentrations between 12.6 and 29.8 mg/kg
- pH values ranged from 7.39 to 7.55

All other metals compounds, asbestos, and cyanide were not detected.

4.5.3 Rinsate and Sediment Disposal Disposition Sampling

Results from rinsate samples collected from the DRMO surface and SDS are presented in

Tables 3 and 4. Detected organic compounds included the following:

- TPHg detected at concentrations of 67.2 and 388 micrograms per liter (µg/L) in samples from the DRMO surface final and initial rinses respectively
- TPHd detected at concentrations between 0.113 and 8.15 milligrams per liter (mg/L)
- TPHmo detected at concentrations between 0.391 and 17.9 mg/L
- O&G detected at a concentration of 39.6 mg/L in the DRMO initial rinse sample
- TRPH detected at concentrations of 3.33 and 4.04 mg/L in the SDS and DRMO initial rinse samples respectively
- The VOC compound bromoform detected at concentrations of 3.43 and 3.69 µg/L in the SDS initial rinse and DRMO final rinse samples respectively
- The VOC compound dibromochloromethane detected at concentrations of 1.02 and 6.87 µg/L in the SDS final and initial rinse samples respectively
- The VOC compound tetrachloroethene detected at a concentration of 11.5 µg/L in the DRMO initial rinse sample
- Phenols detected at concentrations of 0.27 and 0.61 mg/L in the DRMO final and initial rinse samples respectively
- The pesticide compound 4,4'-DDT detected at concentrations of 0.033 and 0.0536 µg/L in samples from the SDS initial and final rinse samples respectively
- The pesticide compound 4,4'-DDE detected at a concentration of 0.029 µg/L in the SDS initial rinse sample

BTEX, SVOC, and PCB compounds were not detected in any of the rinsate samples.

Detected inorganic compounds included the following:

- Copper detected at a concentrations between 10.8 and 20.8 µg/L
- Mercury detected at concentrations of 0.266 and 0.541 µg/L in the SDS and DRMO surface final rinse samples respectively
- Zinc detected at concentrations between 29.4 and 96.8 µg/L
- pH values ranged from 7.7 to 8.15

All other metals compounds and cyanide were not detected.

Results for the two sediment samples collected from the DRMO surface and SDS for disposal disposition are presented in Tables 1 and 2. Detected organic compounds included the following:

- TPHd detected at concentrations of 67.5 and 564 mg/kg in samples from the DRMO surface and SDS sediment respectively
- TPHmo detected at concentrations of 384 and 1,120 mg/kg in samples from the DRMO surface and SDS sediment respectively
- BTEX detected at concentrations of 3.62, 4.15, 2.85, and 9.43 µg/kg in the sample from the SDS sediment
- O&G detected at concentrations of 2,870 and 4,900 mg/ kg in samples from the DRMO surface and SDS sediment respectively
- TRPH detected at concentrations 740 and 1,200 mg/ kg in samples from the DRMO surface and SDS sediment respectively
- The VOC compound methylene chloride detected at a concentration of 14.8 µg/kg in the sample from the SDS sediment

- The SVOC benzyl alcohol detected at a concentration of 26,400 µg/kg in the sample from the DRMO surface sediment
- Phenols detected at concentrations of 2.7 and 6.5 mg/kg in samples from SDS and DRMO surface sediment respectively
- The pesticide compound 4,4'-DDT detected at concentrations of 6.98 and 20.3 µg/kg in samples from the DRMO surface and SDS sediment respectively
- The pesticide compound 4,4'-DDE detected at concentrations of 28.9 and 34.9 µg/kg in samples from the DRMO surface and SDS sediment respectively
- The pesticide compounds beta-BHC and delta-BHC detected at concentrations of 5.57 and 6.88 µg/kg respectively in the sample from the DRMO surface sediment
- The pesticide compound toxaphene detected at a concentration of 1,260 µg/kg in the sample from the SDS sediment
- The PCB compounds aroclor 1016 and 1254 detected at concentrations of 426 and 1,460 µg/kg respectively in the sample from the SDS sediment
- The PCB compound aroclor 1260 detected at a concentration of 117 µg/kg in the sample from the SDS sediment

TPHg was not detected in either of the sediment samples.

Detected inorganic compounds included the following:

- Beryllium detected at concentrations of 0.107 and 0.147 mg/kg in samples from the DRMO surface and SDS sediment respectively
- Cadmium detected at concentrations of 16.3 and 17.4 mg/kg in samples from the DRMO surface and SDS sediment respectively
- Chromium detected at concentrations of 51 and 52 mg/kg in samples from the SDS and DRMO surface sediment respectively
- Copper detected at concentrations of 71.9 and 103 mg/kg in samples from the DRMO surface and SDS sediment respectively
- Lead detected at concentrations of 184 and 236 mg/kg in samples from the DRMO surface and SDS sediment respectively
- Mercury detected at concentrations of 0.455 and 0.869 mg/kg in samples from the SDS and DRMO surface sediment respectively
- Nickel detected at concentrations of 22.6 and 42.2 mg/kg in samples from the DRMO surface and SDS sediment respectively
- Zinc detected at concentrations of 380 and 475 mg/kg in samples from the DRMO surface and SDS sediment respectively
- Cyanide detected at a concentration of 0.659 mg/kg in the sample from the DRMO surface
- pH values ranged from 6.48 to 8.13

All other metals compounds and asbestos were not detected.

5.0 SUMMARY AND CONCLUSIONS

TPHmo and PCBs were detected at concentrations above closure performance standards at three areas (surrounding borings SB-DRMO-002, -016 and -018). These three areas were subsequently excavated and sampled. The excavations at each area were approximately 9-feet square by 3-feet deep. At two of the excavation locations (DRMO-002 and DRMO-016), results were above cleanup goals and the exceedance locations were excavated an additional 3 feet. In addition, the sample from the DRMO-002 excavation north wall (which detected at a PCB concentration of 0.136 mg/kg) was above the PCB cleanup goal of 0.02 mg/kg. However, because the detected PCB concentration was below the most recent USEPA Region IX cleanup goal (*USEPA, 1999*) for PCBs (0.220 mg/kg), this area was not overexcavated. With the exception of the sample from the DRMO-002 excavation, all results from the additional excavation were below cleanup goals. This location was overexcavated an additional 3 feet and resampled. The final confirmation sample from this excavation was below cleanup goals. Excavated soil was taken to the OU2 landfill for use as the foundation layer.

After reviewing the TV/video survey of the SDS, a registered engineer identified several areas with cracks or separations of the pipe. Three locations were selected for sampling of native soil outside the SDS to determine the extent of any subsurface release of chemicals from the SDS. Analytical results indicated evidence of various inorganic and organic compounds; none of the compounds detected, however, were above the DRMO cleanup goals.

Sediment from the SDS and the surface of the DRMO was removed in accordance with the DRMO Closure Plan and the areas were subsequently power washed and cleaned; samples of the initial and final rinsate were collected for analysis. Analytical results of the SDS and DRMO surface final rinsate samples indicated that all detected chemicals were below acceptance criteria set by the local POTW.

Sediment removed from the SDS and the surface of the DRMO was taken to the OU2 Landfill on October 19, 2000, for use as the foundation layer.

Confirmation samples were collected from soil boring excavations, SDS verification locations, and the DRMO surface and SDS rinsate between September 11 and October 25, 2000. Analytical results indicate that all final samples met the performance standards approved by the DTSC to allow closure. On the basis of the activities conducted at the DRMO and discussed in this report, it is concluded that the DRMO CSU has completed the clean closure process..

6.0 REFERENCES

Harding Lawson Associates (HLA). 1993a. *Draft Technical Memorandum, Preliminary Remediation Goals*. June 14.

_____, 1993b. *Draft Final Basewide Background Soil Investigation*. March 15

_____. 1997. *Draft Final Closure Plan, DRMO Hazardous Waste Container Storage Unit, Former Fort Ord, California*. Revised March 25. (No. 23366 08574)

_____. 1999a. *Revised Preliminary Data Evaluation, Soil Boring Investigation, DRMO Hazardous Waste Container Storage Unit, Fort Ord, California*. August 27

_____. 1999b. *Supplemental Analytical Results Submittal, Soil Boring Investigation, DRMO Hazardous Waste Container Storage Unit, Fort Ord, California*. September 29

U.S. Environmental Protection Agency (USEPA). 1995. *Region IX Preliminary Remediation Goals, First Half, Technical Memorandum from Stanford J. Smucker*. February 1.

_____. 1999. *Region IX Preliminary Remediation Goals, Technical Memorandum from Stanford J. Smucker*. October 1.