APPROVAL FORM

Remedial Action Report for Soils
Selma pressure Treating Superfund Site

This report presents a description of the work performed for the Soils remedial action at the Selma Pressure Treating Site, in Selma California. This report has been prepared in accordance with EPA's guidance, "Close Out Procedures for National Priority List Sites," OSWER Directive 9320.2-09A-PPB98-9632233, October 1999.

Approved by:

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Remedial Action Report: Soil Remedy
Selma Pressure Treating Superfund Site, Selma, California
EPA CERCLIS ID Number CAD029452141

I. INTRODUCTION

This Remedial Action (RA) Report documents the U.S. Environmental Protection Agency (EPA) cleanup activities for soil at the Selma Pressure Treating Superfund Site ("Site"). The Selma Pressure Treating Superfund Site consisted of a 14-acre plant facility and a 26 acre former vineyard, in Selma, California. The Site is in the agriculturally rich Central Valley, approximately 15 miles south of Fresno. The Site is zoned for heavy industrial use, but is in a transition zone between agricultural, residential and industrial areas. There are 12 residences and businesses within one-quarter mile of the Site.

Operations and Waste Management Practices

The Site operated as a wood preservative treatment facility from1936 to about 1994. The treatment process originally involved dipping wood into a mixture of pentachlorophenol (PCP) and oil, then drying the wood on open racks. The facility was converted to a pressure treatment process, using solutions primarily containing copper, chromium, and arsenic (CCA) in the mid 1960s. The pressure treated wood was placed on racks in a drip pad area and then moved to the wood storage area.

Discharge practices at the Site included runoff into drainage and percolation ditches, drainage into dry wells, spillage onto open ground, placement into an unlined pond and sludge pit, and discharges to the vineyard. Historical records indicate that wood treatment never took place in the vineyard, but the vineyard received drainage from the plant. These practices resulted in both groundwater and soil contamination. The operating and wood storage areas were paved with asphalt in 1982. In 1997 all pressure vessels and tanks were removed from the site along with all buildings except for the facility office. The former vineyard was sold and is being used as a recycling waste transfer facility.

Regulatory and Enforcement History

From 1971 to 1981, the Regional Water Quality Control Board (RWQCB) regulated Site discharges under a Waste Discharge Requirements (WDR) Order. A Resource Conservation and Recovery Act (RCRA) investigation was performed by EPA and the State Department of Health Services (DHS) in 1981, because of concerns about potential groundwater contamination. The Site owners were required to modify operations to minimize the potential for contamination. Between 1981 and 1984, the RWQCB, EPA and DHS pursued efforts to have the Site owners investigate the Site to determine the extent of contamination. In 1981, the RWQCB issued a Cleanup and Abatement Order, but the owners did not comply with the conditions of the Order. In 1983, DHS issued an Order, Settlement Agreement, and Schedule of Compliance with civil penalties. However, the owners counterproposal was unsatisfactory and DHS referred the Site to EPA for further action in April 1984. Based on initial investigations, EPA added the Site to the National Priorities List (NPL) in September 1983. In September 1991, EPA filed a complaint under Section 107(a) of CERCLA to recover response costs

incurred and to be incurred at the Site. The State filed a similar complaint on the same day. In March 1996, EPA and the State entered into two Consent Decrees with separate Primary Responsible Parties (PRPs), to resolve the liabilities of the owners and operators. The total value of the two settlements was $1,500,000 and an additional $100,000 upon sale of the vineyard.

Findings and Results of Site Investigation Activities

Soil investigations were performed in 1986 and 1987 as part of EPA's Remedial Investigation/ Feasibility Study (RI/FS) to identify contaminants of concern (COCs), characterize their extent and analyze alternatives for cleanup. The site-related COCs included chromium, arsenic, copper, dioxins/furans, pentachlorophenol (PCP) and trichlorophenols (TCPs). A Record of Decision (ROD) for both soils and groundwater was signed in 1988, based on the RI sampling and FS analysis. As part of the remedial design for the soil remedy, additional soil investigations were conducted to better define vertical extent of contamination. Soil samples were also taken during the 1991-93 remedial action for areas not previously sampled. After the remedial action, a series of additional soil studies were performed at the site, leading to a 1993 Explanation of Significant Differences (ESD) and a 2003 ROD amendment for soils. For example, in 1994, dioxin soil screening was conducted. In 1995, extensive additional soil investigation was performed at depth. These data indicated that PCP and arsenic concentrations in soil exceed the 1988 ROD cleanup standards throughout much of the operating area of the Site. In 1997, 98, 99 and 2002, additional data were collected to fill data gaps from other investigations on the volume of contaminated soils remaining. Some of this later data was collected to determine the degree to which soils contaminated with chromium were contributing to the hexavalent chromium in the groundwater. However, this was determined not to be a problem; chromium is not a COC for soils at the Site.

From these investigations, soil contamination was identified both on the plant property, vineyard and adjacent properties. Soil contamination existed in all plant operating areas onsite to the depth of the groundwater table. The 1988 ROD established cleanup standards of 50 ppm arsenic and 1 ppb dioxins/furans based on current industrial use scenario. The 1993 ESD revised the cleanup standards based on a residential risk scenario to 25 ppm arsenic, 17 ppm PCP and 1 ppb dioxin/furans. These cleanup standards remained for the final remedy selected in 2003. The 1993 ESD and 2003 ROD Amendment increased the volume of remediated soils based on the additional soil sampling events described above. Soils exceeding the above cleanup goals (to a maximum depth of 5 feet) were removed during several removal and remedial actions described below.

Prior Removal and Remedial Actions for Soils

In the 1988 ROD, the selected remedy for soils included:

- Excavation of contaminated soil exceeding cleanup goals (13,000 cubic yards)
- Mixing soils with a fixative agent to solidify and stabilize contaminated soil
- Placement of the soils into an impoundment cell onsite
- Placement of a RCRA Cap on top of the fixed soils to provide additional protection from surface disturbance and water infiltration
- Abandonment of six dry wells

The US Army Corps of Engineers (USACE) under an Interagency Agreement (IAG) with EPA performed this remediation work between 1991 and 1993. The excavated soils came from an onsite unlined pond, sludge pit, percolation ditches, and dry wells used to drain surface runoff from the treated wood storage areas of the Site. Off site areas contaminated by drainage from the Site were also removed and stabilized on site.

Based on data collected for remedial design and during the soil remedial action, EPA determined that additional soil remediation work was needed beyond that done under the 1988 ROD. The ESD for the soil remedy included a more stringent cleanup standard for arsenic in soils, (25 ppm), a cleanup standard for pentachlorophenol in soils (17ppm), additional areas of soil contamination requiring cleanup, and documentation of compliance with RCRA Land Disposal Restrictions. Work under this ESD was performed in 1999 by USACE and included excavation of an additional 5,000 cubic yards of soil within and just outside the plant property where drainage and spillage from treatment operations had been deposited on public right of ways and adjacent properties. The excavated soil was stockpiled on site and the excavation area backfilled with clean soil.

In 1997, EPA entered into another IAG under removal authority with the USACE Rapid Response Program, to install a perimeter fence to provide site security and perform demolition of portions of the existing wood treatment facility on site. This removal action also included soils from the yard around a residence/office located within the primary site.

Other Operable Units

In the 1988 ROD, the selected remedy for chromium in groundwater consisted of constructing and operating a groundwater extraction and treatment system to convert hexavalent chromium to trivalent chromium, disposal of treated and tested groundwater by re-injection into the aquifer, and disposal of sludge generated by the treatment process. The groundwater extraction and treatment system including 8 extraction wells was installed from May-August 1998, and the post construction inspections and operational tests were conducted in September 1998. The treatment system began full 200 gallons per minute (gpm) operation in late September 1998. The RA report documenting completed construction activities for the groundwater remedial action was completed in September 2000. The treated groundwater reinjection was discontinued and an evaporation pond utilized instead, as documented in an

ESD in April 1997. Additional groundwater system optimization is occurring at the site as part of the Long Term Remedial Action (LTRA) activities at the site.

II. SOILS OPERABLE UNIT BACKGROUND

Requirements Specified in the 2003 ROD Amendment for Soils

After the additional work done under the ESD, a Focused Feasibility Study for soil was performed under a USACE IAG (Geomatrix Consultants, June 2003) to reevaluate remedial action alternatives using all soil data collected after 1988. The soil remedy described in the 2003 ROD amendment included:

- Using the same cleanup standards as the 1993 ESD
- Excavating approximately 21,000 cubic yards of additional contaminated soil to a maximum depth of five feet
- Uncovering the existing RCRA Cap and placing the excavated soil into the existing RCRA Cap impoundment area
- Placing a new, low-permeability RCRA Cap over the impoundment area
- Fencing the impoundment area
- Backfilling the excavated area with clean soils
- Capping the excavated area with a low-permeability Asphalt RCRA Cap
- Operations and Maintenance of the RCRA Cap and Asphalt RCRA Cap

III. CONSTRUCTION ACTIVITIES

Final Soil Remedy Construction Activities

The Final Soil Remedy Construction included the following tasks in accordance with the September 2003 ROD Amendment:

- Uncovering and removing overburden soils from the existing on site RCRA soil impoundment cell to prepare it to receive additional contaminated soil
- Placing the previously stockpiled 5,000 cubic yards of soil into the soil impoundment
- Laying out a grid and excavating up to 5 feet of surface and subsurface soils (total volume removed was approximately 25,000 cubic yards)
- Installing a RCRA geocomposite clay liner and soil/vegetative cap on the soil impoundment
- Backfilling and grading the excavated areas with clean soil
- Installing a 5.4 acre Asphalt RCRA Cap on the east end of the plant property to cover the excavated area and contain the contaminated soils below five feet
- Operating and maintaining the RCRA Caps for a period of one year (the State will assume O&M after that time).

The excavation, backfill and reinstallation of the RCRA Cap on the soil impoundment was completed in November 2003 and the Asphalt RCRA Cap was completed in May, 2004. The final inspection by EPA and the State of the construction was conducted on June 10, 2004. No punch list items were identified.

There will be land use restrictions placed on portions of the site covered by the Asphalt Cap and RCRA Cap. There will be a land use Covenant and Agreement made between Selma Pressure Treating, the current owner, and the State of California, Department of Toxic Substance Control (DTSC).

IV. CHRONOLOGY OF EVENTS

Date	Event
September, 1983	Site added to National Priorities List
September, 1988	ROD signed
September, 1989	Remedial Design initiated
1991-1993	Soil excavation, fixation, RCRA Cap construction per 1988 ROD
October, 1993	ESD signed reducing arsenic cleanup goal to 25 ppm and adding cleanup standard for pentachlorophenol of 17 ppm
August, 1997	Perimeter fence installed and parts of wood treatment facility demolished
August, 1999	Soil removed outside plant property and stockpiled on site per the 1993 ESD
June, 2003	Focused Feasibility Study completed
September, 2003	ROD Amendment selected Final Soil Remedy
September, 2003	Remedial Design completed for ROD amendment
Oct/Nov, 2003	Soil impoundment uncovered, 2-5 ft of contaminated soils excavated, area backfilled and soil impoundment RCRA Cover installed per 2003 ROD Amendment
May, 2004	Asphalt RCRA Cap installed
June, 2004	EPA and State performed final inspection
Ongoing	O&M of Soil RCRA Cap and Asphalt RCRA Cap

V. PERFORMANCE STANDARDS AND CONSTRUCTION QUALITY CONTROL/FINAL SOIL REMEDY

Overall Performance of the Technology Compared to Cleanup Goals

Performance compared to cleanup goals is documented in Table 1 below. The soil remedial actions met the goals of the 1988 ROD, 1993 ESD and 2003 ROD Amendment.

Table 1 - Performance Results Compared with Remediation Objectives/Cleanup Goals

Remediation Objectives/Cleanup Goals	Performance Results
Attain desired cleanup goals in soils impacted by site operations of 50 ppm arsenic and 1 ppb dioxin/furans	Between 1991 and 1993 approximately 13,000 cubic yards were removed from known contaminated areas to achieve cleanup goals in those areas. These soils were stabilized and placed under a RCRA covered soil cell onsite.
Attain desired cleanup goals in soils impacted by site operations of 25 ppm arsenic, 17 ppm PCP and 1 ppb dioxin/furans	In 1999 approximately 5,000 cubic yards were removed from known contaminated areas outside of the plant property, around the onsite residence and in the NE corner of the plant. Cleanup goals were achieved in these areas. These soils were temporarily stockpiled and covered onsite.
Attain desired cleanup goals in soils impacted by site operations of 25 ppm arsenic, 17 ppm PCP and 1 ppb dioxin/furans	In 2003 approximately 25,000 cubic yards were removed to a maximum depth of five feet and placed in the existing onsite RCRA soil impoundment. The soil impoundment was re-covered with a new RCRA Cap and the soil excavation area was covered with a RCRA asphalt cap per the 2003 ROD Amendment.

Quality Assurance

EPA and the State have reviewed the remedial action contract and construction for compliance with quality assurance and quality control protocols. Construction activities at the site were determined to be consistent with the ROD, RD plans and specifications, and RD/RA statement of work.

Construction Quality Control

The USACE Remedial Contractor adhered to the approved construction quality control plan. The construction quality control plan incorporated all EPA and State requirements including health and safety. All confirmatory inspections, independent testing, audits, and evaluations of materials and workmanship were performed by the USACE.

The USACE designed RCRA Cap for the soil impoundment includes a Geocomposite Clay Liner (GCL) and a Geocomposite Drainage Layer (GeoNet), placed over the complete compacted footprint of the soil impoundment.
During the construction of the soil impoundment and the covering of the impoundment, the USACE Construction Representative inspected all work performed on a daily basis. Compaction testing performed by a third party testing firm and materials (GCL and GeoNet) was inspected by the Contractor and by USACE as they were delivered to insure that they met the project specifications.

The USACE designed the 4" thick new Asphalt RCRA Cap and selected a patented MATCON product to achieve permeability not greater than 1 x 10^{-7} cm/sec. Under USACE supervision, asphalt core samples were collected and shipped to an off site laboratory for permeability testing. The remedial contractor installed the base course soils and compaction testing was provided by a third party consultant. The remedial contractor subcontracted the installation of the aggregate base course and asphalt. The installation of the base course and the asphalt was inspected and tested by a third party consultant.

VI. FINAL INSPECTION AND CERTIFICATION

The final inspection was held June 10, 2004. EPA and the State Remedial Project Managers were present. No punch-list items were identified. The remedy will be considered Operational and Functional one year after the date of the final inspection unless otherwise agreed to between EPA and the State.

VII. OPERATION AND MAINTENANCE

The impoundment area RCRA Cap was covered and hydro seeded in November, 2003 with a low maintenance drought resistant vegetative cover. Inspection of the vegetative cover and surrounding drainage channels will be conducted annually. The cover will be mowed on an as-needed basis.

The Asphalt RCRA Cap will be inspected on an annual basis to evaluate integrity. Results of inspections may dictate sealing of cracks or damaged areas or cleaning of drain inlets and manholes in the subsurface drainage system.

VIII. SUMMARY OF PROJECT COSTS

Table 2 presents a comparison of actual project costs and combined costs estimates of the original ROD, ESD and the 2003 ROD amendment for the soil remedy. Table 3 presents the detailed breakdown of costs for the entire soil cleanup. Table 4 shows site characteristics and conditions affecting costs and Table 5 documents operating parameters affecting cost

Table 2 – Cost Summary

Cost Item	ROD and ROD Amendment Estimate	Actual Cost
RA Capital Cost	$6.7M	$12.25 M
Projected O & M Cost 30 yr	$350,000	$360,000

The main cost difference is due to project cost growth between the ROD estimate ($4 million) and the actual cost for that period of activity ($8 million). These amounts are embedded in the costs Table 2.

Table 3 – Detail of Project Cost

Cost Element	Cost ($)
1992 Excavation/Fixation/Impoundment/Cap	7,300,000
Site Visit/Mobe/Demobe	122,439
Work Plan Preparations	85,150
Construct Perimeter Fence	34,825
Clean/Demolish Tanks	73,598
Perimeter off site excavation	339,472
Reports	13,531
Site Administration	997,692
Home office	88,929
Remove and Recover Soil Impoundment	212,647
Excavate/Backfill/Grade Cap Area	246,051
Install Asphalt Cap and Drainage	1,635,336
USACE Oversight	1,100,000
Total Capital Cost	12,249,670

The soil remedy is complete with a current expenditure of $12.25 million. Long term O&M of the soil Cap and the asphalt Cap remains to be performed. The expected costs for the O&M are estimated to be $12,000 per year.

Table 4 – Characteristics and Site Conditions Affecting Costs

Parameter	Site Conditions	Measurement Procedure/Comment
Air Temperature (°F)	30 – 110 typically	NA
Humidity (%)	20 – 50 typically	NA
Average Rainfall (inches/year)	10 typically	NA
Soil Types	Interbedded layers of silty sands and coarse sands with some cemented aquitards	NA
Quantity of Contaminated Soils placed in the Soil Impoundment Cell	45,000 cubic yards approximately between 1993 and 2003	NA
4" Low Permeability Asphalt Cap, Area	5.6 acres (244,122 sq feet)	NA

Table 5 – Operating Parameters Affecting Cost

Parameter	Site Conditions	Measurement Procedure/Comment
Compaction, Contaminated Soil Impoundment	Contaminated silty sand from the site	90% maximum laboratory density, 8.5% optimum moisture
Compaction, Cover on Soil Impoundment	Clean backfill from the site, silty sand, 18" thick	Proof rolling with construction equipment
Low Permeability Cap, Soil Impoundment Cell	Geocomposite Clay Liner, Geonet Drainage Layer, Soil Cover (above)	GCL, 0.75 lbs bentonite/sq foot Geonet with Geotextile both sides
Compaction, Subgrade Soils Beneath Asphalt Cap	Clean backfill from the site, silty sand	95% maximum laboratory density, 8.5% optimum moisture
Compaction, Aggregrate Base Course Beneath Asphalt Cap	¾" maximum aggregate size road base, 6" layer	100% maximum laboratory density, 7-10% optimum moisture
Low Permeability Asphalt Cap	Patented MATCON modified asphalt	Permeability Coefficient $<1x10^{-7}$ cm/sec

IX. OBSERVATIONS AND LESSONS LEARNED

Greater storage capacity within the contaminated soil impoundment cell was available during construction activities in 2003, than was anticipated in the remedial design. This allowed more site impacted soils and debris to be placed into the cell below existing ground surface and reduced the aboveground height of the cell from 15 feet (as designed) to 8.5 feet.

The asphalt used for the asphalt capped portion of the site was designed to meet RCRA Cap permeability criteria while remaining durable enough for site reuse.

X. CONTACT INFORMATION

EPA used the following USACE Districts for construction oversight and contract management:

1992 - 1995
US Army Corps of Engineers
Sacramento District
1325 J Street
Sacramento, California 95814-2922
Contact: Linda Finley-Miller
Phone Number: 916-557-7411

1997 – Present
US Army Corps of Engineers
Bldg 525, Castle Hall, Third Floor
Offutt AFB, Nebraska 68113
Contact: Waleed Shaheen
Phone Number: 402-293-2517

USACE contracted the following remedial contractors for the RA:

Rust Remedial Services
(No longer an active business)

IT Corporation
2790 Mosside Blvd.
Monroeville, Pa 15146
Contact: Al Meyers
Telephone: 412-858-3938

Shaw Environmental & Infrastructure
2790 Mosside Blvd.
Monroeville, Pa 15146
Contact: Al Meyers
Telephone: 412-858-3938

The following companies provided third party testing of the field construction:

Central Valley Testing Laboratory – Visalia, California – 559-732-3039
GARCO Testing Laboratory – Fresno, California – 559-263-9612
ABATECH Inc. – Blooming Glen, Pa. – 215-258-3640

The Remedial Project Managers for the EPA were:

Michelle Lau
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75 Hawthorne
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