

# Five-Year Review Report

## Second Five-Year Review Report

for

**Western Pacific Railroad Superfund Site  
Butte County, California**

**September 2008**

**PREPARED BY:**

**United States Environmental Protection Agency  
Region 9  
San Francisco, California**

Approved by:



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Date:



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## List of Acronyms

AOC	administrative order on consent
ARARs	applicable or relevant and appropriate requirements
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CWS	California Water Service
1,1-DCA	1,1-dichloroethane
1,1-DCE	1,1-dichloroethene
DTSC	California Department of Toxic Substances Control
EPA	United States Environmental Protection Agency
HHRA	human health risk assessment
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
MCL	maximum contaminant level
NCP	National Contingency Plan
NPL	National Priorities List
PAHs	polycyclic aromatic hydrocarbons
RAOs	remedial action objectives
RI	remedial investigation
ROD	record of decision
RWQCB	California Regional Water Quality Control Board
1,1,1-TCA	1,1,1-trichloroethane
TCE	trichloroethene
UPRR	Union Pacific Railroad Company
UST	underground storage tank
VOCs	volatile organic compounds
WPRR	Western Pacific Railroad

## **Executive Summary**

The remedy for the Western Pacific Railroad (WPRR) Superfund Site (the Site) in Butte County, California, included: 1) groundwater extraction and treatment, 2) excavation of contaminated soils and backfilling with clean fill, and 3) institutional controls. Because waste remains in place, the trigger for this five-year review was the start of the soil remedial action on July 23, 1998.

The first five-year review found that the remedy was completed in accordance with the requirements of the September 1997 Record of Decision. The groundwater and soil remedies functioned as designed and the institutional control continues to function as designed. All cleanup goals were achieved and the site was deleted from the National Priorities List (NPL) on August 29, 2001.

This five-year review found that the remedy is protective of human health and the environment. Institutional controls are preventing exposure to contaminated soil and the ingestion of on-site groundwater with residual contamination. To be protective in the long-term, the groundwater monitoring program will need to be revised to verify that residual groundwater contamination remains on-site.

## Five-Year Review Summary Form

SITE IDENTIFICATION		
<b>Site name:</b> Western Pacific Railroad		
<b>EPA ID:</b> CAD980894679		
<b>Region:</b> 9	<b>State:</b> CA	<b>City/County:</b> Butte County
SITE STATUS		
<b>NPL status:</b> <input type="checkbox"/> Final <input checked="" type="checkbox"/> Deleted <input type="checkbox"/> Other (specify)		
<b>Remediation status</b> (choose all that apply): <input type="checkbox"/> Under Construction <input type="checkbox"/> Operating <input checked="" type="checkbox"/> Complete		
<b>Multiple OUs?*</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	<b>Construction completion date:</b> 03/31/1999	
<b>Has site been put into reuse?</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> N/A		
REVIEW STATUS		
<b>Lead agency:</b> <input checked="" type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency _____		
<b>Author name:</b> Holly Hadlock		
<b>Author title:</b> Remedial Project Manager	<b>Author affiliation:</b> U.S. EPA Region 9	
<b>Review period:</b> 03/2008 to 06/2008		
<b>Date(s) of site inspection:</b> 03/06/2008		
<b>Type of review:</b>		
<input checked="" type="checkbox"/> Post-SARA <input type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only <input type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> NPL State/Tribe-lead <input type="checkbox"/> Regional Discretion		
<b>Review number:</b> <input type="checkbox"/> 1 (first) <input checked="" type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify) _____		
<b>Triggering action:</b>		
<input type="checkbox"/> Actual RA Onsite Construction at OU #2	<input type="checkbox"/> Actual RA Start at OU# _____	
<input type="checkbox"/> Construction Completion	<input checked="" type="checkbox"/> Previous Five-Year Review Report	
<input type="checkbox"/> Other (specify)		
<b>Triggering action date (from WasteLAN):</b> 09/04/2003		
<b>Due date (five years after triggering action date):</b> 09/04/2008		

\* OU – Operable Unit

## Five-Year Review Summary Form, cont'd.

**Issues:**

The recent and only groundwater sampling for this five-year review indicates that concentrations of 1,1-DCA have risen to the cleanup level of 5 µg/L.

**Recommendation and Follow-up Action:**

Devise and implement a revised groundwater sampling program to verify that contamination remains on site.

**Protectiveness Statement:**

The remedy at Western Pacific Railroad is protective of human health and the environment and in the interim; there is no exposure to residual contamination that could result in unacceptable risks. Institutional controls are preventing exposure to contaminated soil and the ingestion of on-site groundwater with residual contamination. To be protective in the long-term, the groundwater monitoring program will need to be revised to verify that residual groundwater contamination remains on site.

**Other Comments:**

None

**Western Pacific Railroad Superfund Site  
Butte County, California  
Five-Year Review Report**

**I. Introduction**

The purpose of a five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, five-year review reports identify issues found during the review and present recommendations to address them.

The United States Environmental Protection Agency (EPA), Region 9, is preparing this statutory Five-Year Review report for the Western Pacific Railroad Site pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §121(c) and the National Contingency Plan (NCP) §300.430(f)(4)(ii). CERCLA §121 states:

*If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

EPA interpreted this requirement further in the NCP; 40 CFR §300.430(f)(4)(ii) states:

*If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

EPA Region 9 conducted the five-year review of the remedial actions implemented at the Site in Butte County, California. The Remedial Project Manager conducted this review from February 2008 through April 2008 for the Site. This report documents the results of the review.

This is the second five-year review for the Site. The triggering action for this second review is the date of the first five-year review, September 4, 2003. This five-year review is required due to the fact that hazardous contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.

## II. Site Chronology

**Table 1: Chronology of Site Events**

Event	Date
Railroad fueling and maintenance wastes disposed on site	1880s-1991
1,000 gallon underground storage tank installed	1970s-1980s
Volatile organic compounds detected in California Water Service Company drinking water well located on site	1984-1992
California Regional Water Quality Control Board issued order to investigate on-site waste	1989
Waste pond excavated and backfilled; leaking underground storage tank removed	1989
Final listing on NPL	August 30, 1990
All remaining structures dismantled or demolished, and below-grade structures backfilled with clean fill.	1991
Administrative Order on Consent to conduct a groundwater removal action	August 20, 1993
Administrative Order on Consent to conduct a Remedial Investigation and Feasibility Study	March 15, 1994
Interim removal action – groundwater extraction system installed	1994
Remedial Investigation/Feasibility Study completed	May/July 1997
Proposed plan identifying EPA's preferred remedy presented to the public	July 29, 1997
ROD signed	September 30, 1997
Groundwater cleanup achieved (all concentrations below MCLs)	October 1997
Unilateral Administrative Order for Remedial Action issued by EPA	June 17, 1998
Contaminated Fueling Area soil excavated and backfilled	July 1998
Final inspection of remedial action excavation	December 10, 1998
Groundwater treatment system shut off	November 1999
Final round of groundwater sampling (all concentrations below MCLs)	July 2000
Covenant to Restrict Use of Property filed with Butte County Recorder	March 1, 2001
Final Close-Out Report	June 26, 2001
Deleted from NPL	August 29, 2001
First Five-Year Review	September 4, 2003

### **III. Background**

#### **Physical Characteristics**

The Union Pacific Railroad (UPRR) property (formerly WPRR property) occupies approximately 90 acres in Butte County just outside the southern edge of the City of Oroville, California. Oroville is a community of approximately 15,000 residents, located in Butte County in the northern Central Valley (see Figure 1, Site Location Map). The WPRR Superfund Site includes approximately 37 acres along the eastern edge of this property. The land is relatively flat, with historic dredging tailings from Feather River mining operations on the western portion of the property. The property lies between Baggett-Marysville Road to the east and 5<sup>th</sup> Avenue to the west, and is about one mile east of the Feather River.

#### **Land Resource Use**

The WPRR Company operated a fueling and maintenance yard at the Site from the 1880s until 1970. Activities at the Site included welding, painting, machining, fabricating, and fueling locomotives. These activities occurred in a 10-acre area known as the Fueling Area (See Figure 2, Site Aerial Photo). Structures within the Fueling Area included a roundhouse and turntable, concrete inspection pits, a fueling area, above ground storage tanks, drip pans, and two oil-water separators. In 1970 WPRR ceased its maintenance and repair activities and leased the Fueling Area to the Solano Railcar Company, an independent railcar company. Solano Railcar Company's activities included sandblasting, painting, welding, and machining railcars until 1991. WPRR, and the subsequent owner UPRR, continued to use the fueling tracks and drip pans until 1991, when UPRR dismantled and/or demolished the remaining structures in the Fueling Area and backfilled the below-grade concrete features with clean fill.

Currently, the Fueling Area is inactive but the rest of the Site has a maintenance shop, a small classification yard, and an active rail line. The land immediately east of the Site is residential, with the rest of the surrounding area zoned for commercial and industrial use. UPRR leases to California Water Service (CWS) a public drinking water well (CWS-1, also known as WP-01), located on the Site just west of the Fueling Area rail line.

The subsurface of the railroad area is composed of thickly and thinly bedded and interbedded clays, sands, and gravels. These deposits are considered to be of fluvial origin. These soils vary in thickness and composition both horizontally and vertically across the Site. In 1997 the dominant groundwater flow direction was to the southwest toward the Feather River. The depth to the shallow aquifer is approximately 60 feet below ground surface (bgs). A shallow aquitard, consisting primarily of clay, is approximately 110 feet bgs.

#### **History of Contamination**

During fueling, machining, and repairing of locomotives and railcars, various surface spills occurred, causing contamination of soil and groundwater. Polycyclic aromatic hydrocarbons (PAHs) and diesel fuels were identified in site soils in the Fueling Area. Wastewater, oil and grease, and possibly solvents from Fueling Area operations were channeled to an on-site unlined surface impoundment known as the "waste pond". At least once a fire was set in the waste pond in order to burn off the waste oil.

In 1989 a 1,000 gallon underground storage tank (UST) at the eastern edge of the Fueling Area was discovered and later determined to have discharged solvents and waste oil into the groundwater. This UST was the source of the Site groundwater contamination.

### **Initial Response**

The WPRR site was initially investigated by the California Regional Water Quality Control Board (RWQCB), which listed the surface impoundment as a toxic pit under the Toxic Pits Cleanup Act in 1986. From 1984 to 1992 low concentrations of 1,1-dichloroethene (1,1-DCE), 1,1,1-trichloroethane (1,1,1-TCA), and 1,1-dichloroethane (1,1-DCA) were detected in CWS-1. The well was shut down temporarily in 1984 due to concentrations of 1,1-DCE above drinking water standards. In 1989 the RWQCB issued an order requiring UPRR to investigate the waste pond and site groundwater. A waste classification study identified metals, fuel-related hydrocarbons, and PAHs in the waste pond sludge and as a result, the waste pond was excavated and backfilled with clean fill.

During the groundwater investigation volatile organic compounds (VOCs) were discovered beneath the Fueling Area and the source was determined to be a leaking UST. The UST was removed and disposed off-site in November 1989. Additionally, two on-site supply wells (north abandoned well and south abandoned well) located within the Fueling Area were abandoned in April 1989.

The plume of water contaminated with VOCs spread approximately 700 feet down-gradient from the UST toward well CWS-1, which was being used by CWS as a source of public drinking water. The Site was proposed to the NPL on October 26, 1989, and finalized on the NPL on August 30, 1990, due to the continued threat of migration of the VOC plume.

By 1993 1,1-DCE was not detected in CWS-1. However, EPA initiated a removal action to contain the VOC groundwater plume in the Fueling Area and prevent it from reaching well CWS-1 again. 1,1-DCE was the primary contaminant of concern at 370 µg/L, substantially above the drinking water standard of 6 µg/L. On August 20, 1993, UPRR entered into an Administrative Order on Consent (AOC) with the EPA to conduct a removal action to contain and clean up the VOC plume by installing a system to pump, treat, and re-inject the groundwater. In September 1994 UPRR installed and began operating the system, which included one extraction well (EW-1), an air stripper, two granular activated carbon units, and an injection well.

### **Basis for Taking Action**

On March 14, 1994, UPRR and EPA signed a second AOC to conduct a Remedial Investigation (RI) and Feasibility Study at the Site. UPRR conducted the RI in 1994 and focused on site soils because the groundwater contamination was already being addressed with the groundwater treatment system. The RI indicated that elevated soil contamination was limited to the former Fueling Area.

The human health risk assessment (HHRA) was conducted as part of the RI. Because of the Site history, current land use, and anticipated future land use, the HHRA evaluated the risks to human health and the environment under industrial land use scenarios rather than residential use scenarios. The HHRA identified an elevated risk to on-site workers and trespassers through dermal contact due primarily to the presence of PAHs in soil at concentrations above the EPA's preliminary remediation goals. The highest concentrations PAHs were found in soil at depths from 0 to 1 foot bgs.

## IV. Remedial Actions

### Remedy Selection

EPA issued the Record of Decision (ROD) for the WPRR Superfund site on September 30, 1997. Remedial Action Objectives (RAOs) were developed as a result of data collected during the RI to aid in the development and screening of remedial alternatives to be considered for the ROD. The RAOs were developed based on the EPA's decision to clean up the Site soils to an exposure level that is safe for on-site workers and trespassers but is above cleanup levels for residential use. The specific RAOs developed for the Site included:

- Reduce the potential for worker exposure to residual soil contaminants;
- Reduce overall severity of worker exposures (duration of exposure incidents and/or exposure concentrations);
- Maintain a groundwater monitoring program to document that residual contaminants of concern at the Site will not impact groundwater;
- Develop on-site access controls as a method to monitor potential threat to human health or the environment;
- Monitor the potential for any future release;
- Monitor and control future land use in impacted areas; and
- Monitor and control the potential for an off-site release.

The major components of the remedy selected in the ROD included the following:

- Excavation and off-site disposal of approximately 44,000 cubic feet (1-acre, 1-foot deep) of contaminated soil,
- A restriction of future use of the property to industrial use only, and
- Continued extraction and treatment of contaminated groundwater.

The cleanup standard for soil was defined as a residual mean soil concentration for benzo(a)pyrene of 0.41 milligrams per kilogram (mg/kg) or less, in order to reduce the cancer risk from exposure of on-site workers to this contaminant. The cleanup standards for groundwater were defined as the State and Federal maximum contaminant levels (MCLs) for drinking water.

### Remedy Implementation

EPA issued a Unilateral Administrative Order on June 17, 1998, requiring UPRR to perform the remedial action and pay EPA's past costs for cleaning up the Site. The order also directed UPRR to take steps to implement an effective institutional control that would restrict the future use of the Site.

The soil remedial action began on July 23, 1998, and took six days to complete. Approximately 1,720 tons of contaminated soil were excavated, placed on railcars, and shipped to the ECDC Environmental landfill near Price, Utah. Soil samples were collected from the bottom of the excavated area before the area was backfilled with clean soil. Analytical results of the soil samples showed that the residual mean concentration of PAHs met the cleanup goal established in the ROD. EPA conducted a final inspection on December 10, 1998, and determined that all remedial action construction activities had been completed.

In 2000 EPA, UPRR, and the California Department of Toxic Substances Control (DTSC) developed an institutional control which prohibits the use of the property for:

- Residential use
- A hospital for humans
- A public or private school for persons under 21 years of age
- A day care center
- Any other purpose involving residential occupancy on a 24-hour basis

Extraction of groundwater for purposes other than Site remediation is also prohibited without prior written approval by EPA.

On March 1, 2001, UPRR filed the Covenant to Restrict Use of Property with the Butte County Recorder's Office. The Covenant was signed by UPRR and DTSC, with EPA as a third-party beneficiary. It prohibits the future use of the property for the above uses and prohibits the extraction of groundwater except for Site remediation purposes. It also stipulates that any contaminated soils brought to the surface during any site activities shall be managed in accordance with all applicable state and federal laws.

### **System Operations and Delisting**

The groundwater pump, treat, and re-injection system that UPRR installed in 1994 operated continuously for three years. In 1997 EPA determined that contaminant mass removal could be improved by installing a dual-phase groundwater extraction and soil vapor extraction well near the source area. This well, EW-2, was installed in March 1997 and the original extraction well, EW-1, was shut off. The concentration of 1,1-DCE in groundwater decreased immediately and by October 1997 the concentrations were below the ROD cleanup goal which was the State of California maximum contaminant level (MCL) of 6 micrograms per liter ( $\mu\text{g/L}$ ).

After two years of continued monitoring, all contaminant concentrations remained below MCLs. The groundwater/soil vapor extraction system was shut off in November 1999 and a final round of groundwater sampling conducted in July 2000 confirmed that all contaminants remained below the MCLs. The components of the groundwater treatment system remain in place and none of the wells have been abandoned at this time.

On June 26, 2001, the Final Closeout report for the Site was signed by the EPA. On July 18, 2001, a Notice of Intent to Delete the Site from the NPL was published in the Federal Register. EPA did not receive any comments during the 30-day comment period and on August 29, 2001, the Site was deleted from the NPL.

### **V. Progress Since the Last Five-Year Review**

The previous five-year review report, issued on September 4, 2003, determined that the remedial actions for groundwater and soil continue to be protective of human health and the environment. The report did indicate that CWS was using groundwater from the well it leases from UPRR without prior written EPA approval, as required by the restrictive covenant. EPA determined that because the contamination in the groundwater remains below cleanup standards, EPA would have approved such a request. This violation did not affect the protectiveness of the remedy so no other actions have been implemented at the Site

since the previous five-year review. In 2008 UPRR submitted to EPA a request to use the Site groundwater. EPA approved with the condition that if VOCs are detected in EW-1, the groundwater supply will be shut off. The status of the issue identified in the previous Five-Year review report as well as the associated recommendations and follow-up actions are summarized in Table 2.

**Table 2: Actions Taken Since the Last Five-Year Review**

Issue from Previous Review	Recommendations/ Follow-up Actions	Party Responsible	Action Taken and Outcome	Date of Action
Use of well CWS-1 by CWS in violation of the Restrictive Covenant.	Request written approval from EPA to allow for distribution of groundwater for drinking purposes.	UPRR	UPRR submitted request, EPA approved conditionally	2008
	Submit validated sampling data from CWS-1 to the EPA.	UPRR	Data submitted, no contamination detected	2008

## VI. Five-Year Review Process

### Administrative Components of the Five-Year Review Process

Holly Hadlock, the EPA Remedial Project Manager, conducted the five-year review from February 2008 through June 2008. Ms. Hadlock conducted the site inspection on March 6, 2008, to establish that the restrictions on land use at the Site have been maintained.

### Community Involvement

A public notice was published in two Oroville newspapers, *The Mercury Register*, on April 21, 2008. The notice informed the public of EPA's intent to conduct a five-year review of the Site and where the results of the review would be available.

### Document Review

The five-year review process included review of a number of relevant documents, including but not limited to, the ROD and the Covenant to Restrict Use of the Property. See Attachment 1, List of Documents Reviewed, for the complete list of documents.

### Data Review

At EPA's request, UPRR conducted groundwater sampling for this five-year review. On March 13, 2008, monitoring well MW-89-02 was purged with a submersible pump using EPA established low-flow sampling protocols. A groundwater sample was then collected and submitted to TestAmerica in Morgan Hill, California (CA ELAP # 2682) for analysis of VOCs (EPA Method 524.2). A split groundwater sample was collected by EPA and was analyzed at the EPA laboratory in Richmond, California.

Analytical results indicated that 1,1-DCE, 1,1,1-TCA, and TCE continue to be present in the groundwater at concentrations below the Federal and State MCLs. The concentration of 1,1-DCA in well MW-89-02 was 5.4 µg/L, which is above the cleanup level of 5.0 µg/L.

Because 1,1-DCA was detected just above the cleanup goal, UPRR and EPA conducted a second round of sampling on May 22, 2008, in order to confirm the March sampling results. EPA and UPRR sampled three wells during the second round: MW-89-02 and the two extraction wells, EW-1 and EW-2. The concentration of 1,1-DCA was again just above the clean-up level in MW-89 at about the same concentration as found in the March sampling event. 1,1-DCA was not detected in EW-1 and was at 0.8 µg/L in EW-2. Table 3 below summarizes the results of groundwater sampling conducted during the current and previous five-year reviews.

**Table 3: Summary of Groundwater Analytical Results**

Sample Location	Sample Date	Groundwater Analytical Results (µg/L)		
		1,1-DCA	1,1-DCE	1,1,1-TCA
MW-89-02	7/18/2002	1.4	1.7	1.7
	3/13/2008	4.0	1.2	1.7
	3/13/2008 (split sample)	5.4	1.3	2.0
	5/22/2008	5.3	1.8	2.3
	5/22/2008 (split sample)	4.4	1.6	1.7
EW-01	5/22/2008	ND	ND	ND
	5/22/2008 (split sample)	ND	ND	ND
EW-02	7/18/2002	0.6	ND	0.91
	5/22/2008	0.8	ND	ND
	5/22/2008 (split sample)	0.7	ND	ND
Federal MCL (July 2002)		--	7	200
California MCL (August 2007)		5	6	200

During the March 2008 sampling, chloromethane (0.83 µg/L) was observed in the trip blank but not in the monitoring well sample. Chloromethane is a common laboratory contaminant and is not considered to be associated with groundwater from the monitoring well.

CWS samples its public supply well, CWS-01, on a quarterly basis for bacteriologicals and radiologicals and annually for VOCs, inorganics, and minerals. Analytical data provided by CWS indicate that low concentrations of 1,1-DCE and 1,1-DCA (0.27 to 1.44 µg/L) were detected between 1985 and 1992; however neither 1,1-DCE or 1,1-DCA has been detected above the method detection limit since 1992. Between 2003 and 2007, CWS analyzed six sampling rounds using EPA Method 524.2. All results were non-detect.

Water level measurements were collected at site monitoring wells between 1989 and 1999 as part of the monitoring program. Depth to groundwater across the site historically ranged between 55 and 65 feet bgs, with groundwater flowing in a west-southwesterly direction under a hydraulic gradient of 0.003 feet per foot (see Figure 3, Groundwater Gradient). Consistent with historical trends, depth to groundwater

recorded at EW-1, EW-2, and MW-89-02 during the June 2008 Five-Year Review sampling event ranged between 60 and 62 feet bgs. The direction continues to be in the west-southwesterly direction.

Monitoring well MW-89-02 is located adjacent to the former underground storage tank and next to the extraction well EW-2 (See Figure 4, Fueling Area Layout). MW-89-02 is screened between 57 to 67 feet bgs, while EW-2 is screened over a longer interval from 22 to 72 feet bgs. Consequently, MW-89-02 pulls from a shallower zone of the aquifer as compared to the adjacent well, EW-2. Approximately 300 feet downgradient of EW-2 and MW-89-02 is EW-1 which is screened from 59 to 89 feet bgs. CWS-01 is located further down gradient, approximately 400 feet past EW-1. Construction details for the well are unavailable; however CWS believes the well is screened across both the upper and deep aquifers (approximately 55 to 152 feet bgs).

### **Site Inspection**

Holly Hadlock conducted a site inspection on March 6, 2008. The purpose of the inspection was to confirm that no activities have taken place on the Site that would violate the institutional controls. UPRR continues to run trains along the rail line. There are no non-railroad related activities taking place at the Site, which remains vacant and undeveloped. A copy of the Site Inspection Checklist is included in Attachment 2.

### **Interviews**

Holly Hadlock conducted interviews by telephone with people connected to the site. Eric Teitelman, Director of Community Development and Public Works, City of Oroville, was interviewed on June 16, 2008. He was not able to identify any concerns regarding the Site and the public has not contacted him or the City about it. He did express a desire that the currently vacant land in the Fueling Area be used for some industrial or commercial endeavor, but he also understood that it is UPRR's decision to redevelop or sell the property. Greg Silva, District Superintendent, California Water Service, discussed the use of groundwater from the CWS-1 well at the site. He said the well is operated as needed, usually more in the summer and fall and less in the spring. In 2007 approximately 44 million gallons were pumped. Kim Donovan of CWS provided information regarding the sampling schedule for various analytes. Due to lack of community interest when the site was deleted from the NPL, local community members were not interviewed for this five-year review.

## **VII. Technical Assessment**

The following conclusions support the determination that the remedial measures implemented are protective of human health and the environment.

### Question A: Is the remedy functioning as intended by the decision document?

The review of documents, ARARs, risk assumptions, and the results of the site inspection indicates that the remedy is functioning as intended by the ROD. The removal of the contaminated soil and replacement of clean fill has achieved the remedial objective to reduce exposure to contaminants in soil. The effective implementation of institutional controls has prevented exposure to subsurface soils and contaminated

groundwater. No activities were observed that would have violated the institutional controls.

The monitoring well network provides sufficient data to monitor the residual contamination. However, the recent rise in 1,1-DCA indicates that a more frequent monitoring program is warranted to achieve the remedial action objective of monitoring the potential for an off-site release. EPA will direct UPRR to submit a revised monitoring plan for EPA approval.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?

The 1996 Remedial Investigation for the WPRR Site included a risk assessment that focused on the soil contamination exposure of PAHs and metals to an on-site worker and trespassers, and dust exposure to nearby residents. The risk assessment determined that the groundwater pathway for these chemicals was incomplete based on modeling that showed that PAHs and metals would not migrate to groundwater. The analysis in the Risk Assessment found that the risks were within EPA's acceptable risk range under an industrial use scenario.

Although the Risk Assessment did not evaluate the groundwater for the VOCs, the ROD did select continued pump and treat until State and Federal MCLS were reached. The ROD also selected a soil clean-up level of 0.41 mg/kg for benzo(a)pyrene.

The toxicity of many chemicals has been reassessed since completion of the Risk Assessment in 1996. In 2008 EPA consolidated all EPA Regional Screening Levels into one table, the Regional Screening Level (RSL) table. The RSL table was developed using the latest toxicity values, default exposure assumptions and physical and chemical properties and is consistent with the OSWER chemical toxicity hierarchy. For benzo(a)pyrene, the current screening level for industrial soil is 0.21 mg/kg. Although there has been a slight change in toxicity for benzo(a)pyrene, the clean-up level of 0.41 mg/kg is still within EPA's risk range. The current drinking water screening level for 1,1-DCA is 2.4 µg/L which equals a 10<sup>-6</sup> cancer risk. The upper limit for 1,1-DCA, a 10<sup>-4</sup> cancer risk, would be 240 µg/L. The State MCL for 1,1-DCA remains at 5 µg/L, which is well within EPA risk range.

There have been no changes in the ARARs that would affect this Site (see Attachment 3). Therefore, the exposure assumptions, toxicity data, cleanup levels, ARARs and remedial action objectives selected at the time of the remedy are still valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

EPA and UPRR sampled the Site groundwater for this five-year review from an on-site monitoring well. The contaminant that historically had the highest concentration, 1,1-DCE, remains below its cleanup level of 6 µg/L. However, samples taken for this five-year review indicate the concentration of 1,1-DCA in MW-89-02 has risen and is now near its cleanup level of 5 µg/L. Because 1,1-DCA was not detected in EW-1 (downgradient between MW-89-02 and CWS-1) and CWS-1, there is no exposure to 1,1-DCA.

Technical Assessment Summary

According to the data reviewed and the site inspection, the remedy is functioning as intended by the ROD. There have been no changes in the physical conditions of the site that would affect the

protectiveness of the remedy. There have been no changes in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment, and no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy.

**VIII. Issues**

The concentration of 1,1-DCA has risen since the last five-year review. It is slightly above the cleanup level of 5.0 µg/L.

**IX. Recommendations and Follow-up Actions**

The following table identifies and recommendations and follow-up actions identified as a result of this five-year review.

**Table 4: Recommendations and Follow-up Actions**

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
Increase in 1,1-DCA	Revise sampling program to monitor potential for off-site release and determine that levels do not remain above MCL.	UPRR	EPA	March 2009	No	Yes

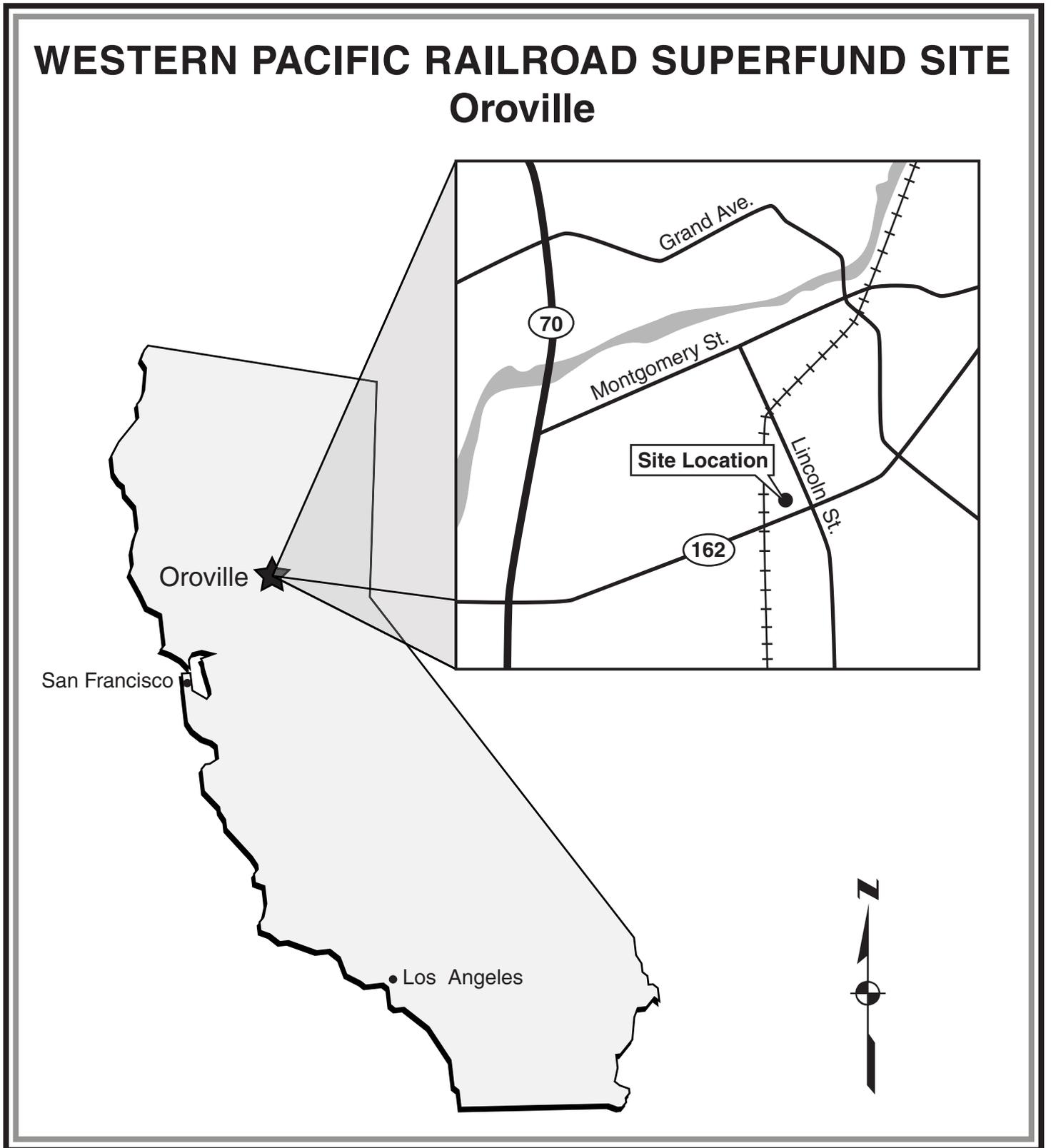
**X. Protectiveness Statement**

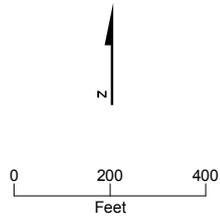
The remedy at Western Pacific Railroad is protective of human health and the environment and in the interim there is no exposure to residual contamination that could result in unacceptable risks. Institutional controls are preventing exposure to contaminated soil and the ingestion of on-site groundwater with residual contamination. To be protective in the long-term, the groundwater monitoring program will need to be revised to verify that residual groundwater contamination remains on site and does not remain above the MCL.

**XI. Next Review**

The next five-year review for the WPRR Superfund Site is required by September 2013, five years from the date of this review.

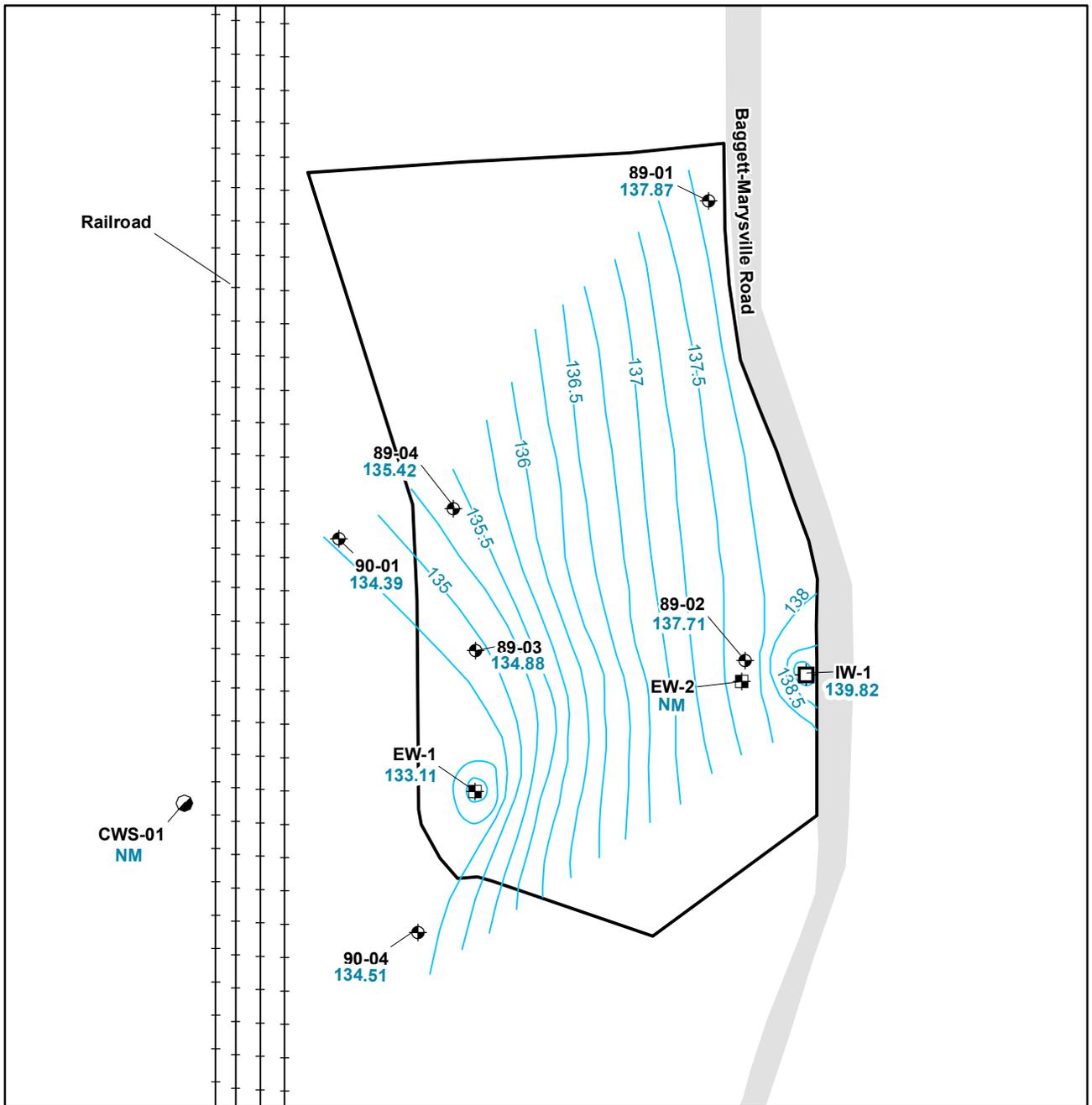
Figure 1 - Site Location Map





**FIGURE 2**  
**Site Aerial Photo**

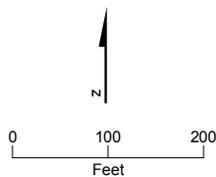
Western Pacific Railroad Superfund Site  
Oroville, California



**LEGEND**

- ◆ 89-02 Monitoring Well
- EW-1 Extraction Well
- CWS-01 California Water Service Well
- IW-1 Injection Well
- Railroad
- Ground Water Gradient (feet above mean sea level)
- 133.11 Groundwater Elevation (feet above mean sea level)

Note:  
 NM = Not Measured

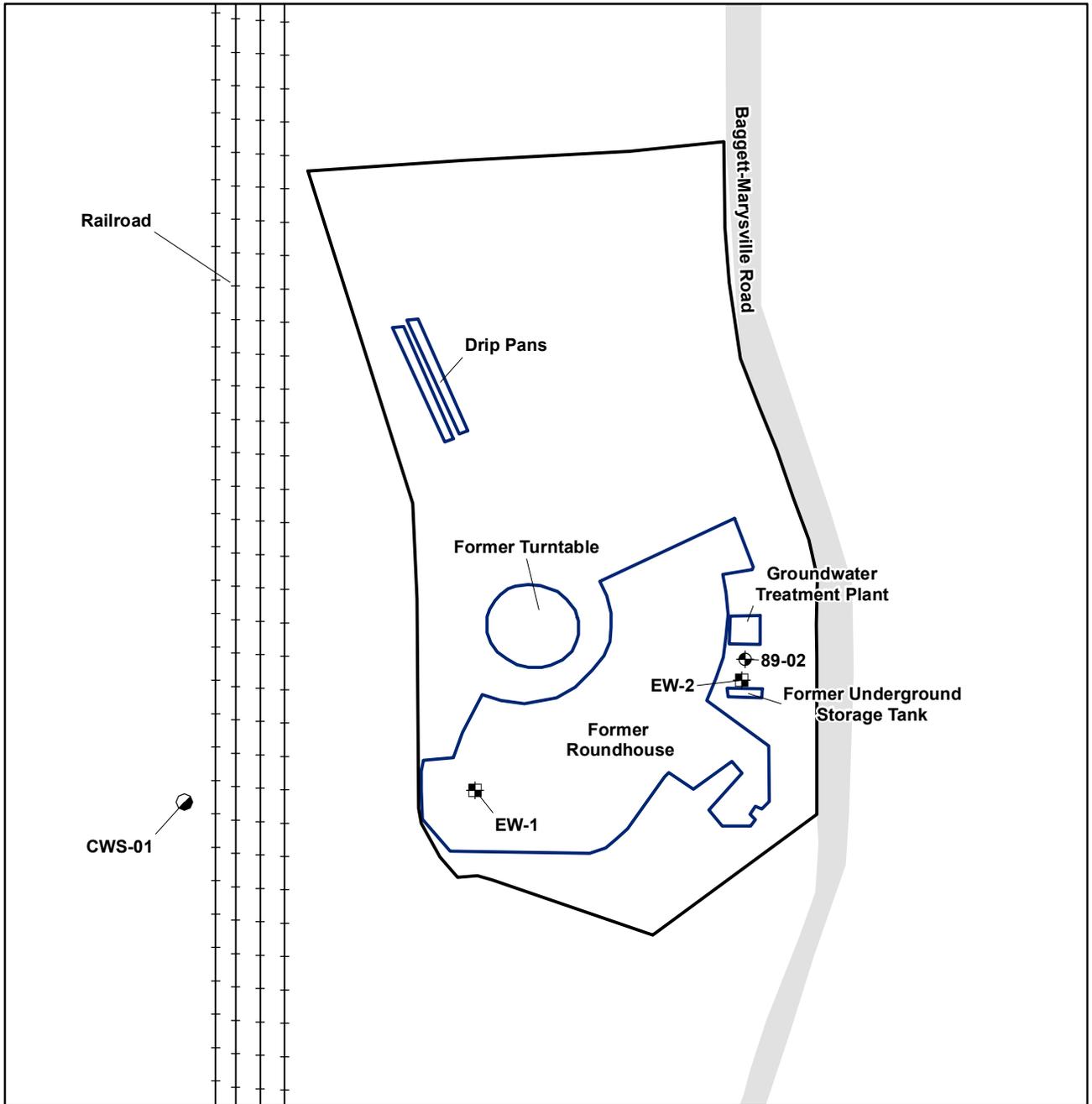


VICINITY MAP



**FIGURE 3**  
**Groundwater Gradient January 1996**  
 Western Pacific Railroad Superfund Site  
 Oroville, California

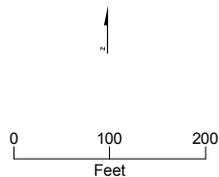
Groundwater gradient data from the Draft Remedial Investigation and Risk Assessment Report (Dames and Moore, 1996)



**LEGEND**

- ◆ 89-02 Monitoring Well
- ◆ Sampled as part of 5-year Review
- ⊠ EW-1 Extraction Well
- ⊠ Sampled as part of 5-year Review
- CWS-01 California Water Service Well
- Railroad

VICINITY MAP



**FIGURE 4**  
**Fueling Area Layout**

Western Pacific Railroad Superfund Site  
Oroville, California

## Attachment 1 – List of Documents Reviewed

*Comprehensive Five-Year Review Guidance*, U.S. Environmental Protection Agency, EPA 540-R-01-007, OSWER No. 9355.7-03B-P, June 2001.

*Action Memorandum/Enforcement*. U.S. Environmental Protection Agency, Region 9. August 24, 1993.

*Groundwater Removal Action Report*, Western Pacific Railroad Superfund Site, Oroville, California, Dames & Moore, December 18, 1995.

*Draft Remedial Investigation and Risk Assessment Report*, Western Pacific Railroad Superfund Site, Oroville, California. Dames & Moore. May 3, 1996.

*Record of Decision*, EPA Region 9. July 1997.

*Administrative Order for Remedial Action*. U.S. Environmental Protection Agency, Region 9. June 17, 1998.

*Draft Soil Remedial Action Report*, Western Pacific Railroad Superfund Site, Oroville, California. Dames & Moore. August 21, 1998.

*Covenant to Restrict Use of Property*. March 1, 2001.

*Final Remedial Action Report*, Western Pacific Railroad Superfund Site, Oroville, California. URS. June 7, 2001.

*Final Closeout Report*, Western Pacific Railroad Superfund Site, EPA Region 9. June 26, 2001.

*Notice of Deletion*, Federal Register. August 29, 2001.

*First Five-Year Report for Western Pacific Railroad Superfund Site*, Oroville, California. U.S. Environmental Protection Agency. September 4, 2003.

*CWS Oroville Western Pacific Well VOC Data*

# Attachment 2

OSWER No. 9355.7-03B-P

Please note that "O&M" is referred to throughout this checklist. At sites where Long-Term Response Actions are in progress, O&M activities may be referred to as "system operations" since these sites are not considered to be in the O&M phase while being remediated under the Superfund program.

## Five-Year Review Site Inspection Checklist (Template)

(Working document for site inspection. Information may be completed by hand and attached to the Five-Year Review report as supporting documentation of site status. "N/A" refers to "not applicable.")

I. SITE INFORMATION													
Site name: <u>Western Pacific RR</u>	Date of inspection: <u>March 6, 2008</u>												
Location and Region: <u>Oroville, CA R9</u>	EPA ID: <u>CAD 980894679</u>												
Agency, office, or company leading the five-year review: <u>US EPA</u>	Weather/temperature: <u>cloudy, 66°</u>												
Remedy Includes: (Check all that apply) <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Landfill cover/containment</td> <td><input type="checkbox"/> Monitored natural attenuation</td> </tr> <tr> <td><input checked="" type="checkbox"/> Access controls</td> <td><input type="checkbox"/> Groundwater containment</td> </tr> <tr> <td><input checked="" type="checkbox"/> Institutional controls</td> <td><input type="checkbox"/> Vertical barrier walls</td> </tr> <tr> <td><input checked="" type="checkbox"/> Groundwater pump and treatment</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Surface water collection and treatment</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Other _____</td> <td></td> </tr> </table>		<input type="checkbox"/> Landfill cover/containment	<input type="checkbox"/> Monitored natural attenuation	<input checked="" type="checkbox"/> Access controls	<input type="checkbox"/> Groundwater containment	<input checked="" type="checkbox"/> Institutional controls	<input type="checkbox"/> Vertical barrier walls	<input checked="" type="checkbox"/> Groundwater pump and treatment		<input type="checkbox"/> Surface water collection and treatment		<input type="checkbox"/> Other _____	
<input type="checkbox"/> Landfill cover/containment	<input type="checkbox"/> Monitored natural attenuation												
<input checked="" type="checkbox"/> Access controls	<input type="checkbox"/> Groundwater containment												
<input checked="" type="checkbox"/> Institutional controls	<input type="checkbox"/> Vertical barrier walls												
<input checked="" type="checkbox"/> Groundwater pump and treatment													
<input type="checkbox"/> Surface water collection and treatment													
<input type="checkbox"/> Other _____													
Attachments: <input type="checkbox"/> Inspection team roster attached <input type="checkbox"/> Site map attached													
II. INTERVIEWS (Check all that apply)													
1. O&M site manager _____ <table style="width: 100%; border: none;"> <tr> <td style="width: 40%; text-align: center;">Name</td> <td style="width: 20%; text-align: center;">Title</td> <td style="width: 40%; text-align: center;">Date</td> </tr> <tr> <td colspan="3">               Interviewed <input type="checkbox"/> at site    <input type="checkbox"/> at office    <input type="checkbox"/> by phone    Phone no. _____             </td> </tr> <tr> <td colspan="3">               Problems, suggestions; <input type="checkbox"/> Report attached _____             </td> </tr> </table>		Name	Title	Date	Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____			Problems, suggestions; <input type="checkbox"/> Report attached _____					
Name	Title	Date											
Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____													
Problems, suggestions; <input type="checkbox"/> Report attached _____													
2. O&M staff _____ <table style="width: 100%; border: none;"> <tr> <td style="width: 40%; text-align: center;">Name</td> <td style="width: 20%; text-align: center;">Title</td> <td style="width: 40%; text-align: center;">Date</td> </tr> <tr> <td colspan="3">               Interviewed <input type="checkbox"/> at site    <input type="checkbox"/> at office    <input type="checkbox"/> by phone    Phone no. _____             </td> </tr> <tr> <td colspan="3">               Problems, suggestions; <input type="checkbox"/> Report attached _____             </td> </tr> </table>		Name	Title	Date	Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____			Problems, suggestions; <input type="checkbox"/> Report attached _____					
Name	Title	Date											
Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____													
Problems, suggestions; <input type="checkbox"/> Report attached _____													

NA

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency City of Oroville, Community Dev. + Public Works 24-20  
 Contact Eric Teitelman Director 6/16/08 (530) 538-~~2507~~  
Name Title Date Phone no.  
 Problems; suggestions;  Report attached No concerns or issues

Agency City Oroville, Dept. Public Works  
 Contact Rick Walls Senior Civil Engr. 6/16/08 530-538-2507  
Name Title Date Phone no.  
 Problems; suggestions;  Report attached No concerns or issues

Agency \_\_\_\_\_  
 Contact \_\_\_\_\_  
Name Title Date Phone no.  
 Problems; suggestions;  Report attached \_\_\_\_\_

Agency \_\_\_\_\_  
 Contact \_\_\_\_\_  
Name Title Date Phone no.  
 Problems; suggestions;  Report attached \_\_\_\_\_

4. **Other interviews (optional)**  Report attached.

California Water Service - 6/3/08 phone calls

Greg Silva - 530-533-4034

Kim Donovan - 530-893-6334

N/A III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1.	<b>O&amp;M Documents</b> <input type="checkbox"/> O&M manual <input type="checkbox"/> As-built drawings <input type="checkbox"/> Maintenance logs Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> N/A <input type="checkbox"/> N/A <input type="checkbox"/> N/A
2.	<b>Site-Specific Health and Safety Plan</b> <input type="checkbox"/> Contingency plan/emergency response plan Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> N/A <input type="checkbox"/> N/A
3.	<b>O&amp;M and OSHA Training Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> N/A
4.	<b>Permits and Service Agreements</b> <input type="checkbox"/> Air discharge permit <input type="checkbox"/> Effluent discharge <input type="checkbox"/> Waste disposal, POTW <input type="checkbox"/> Other permits _____ Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> N/A <input type="checkbox"/> N/A <input type="checkbox"/> N/A <input type="checkbox"/> N/A
5.	<b>Gas Generation Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> N/A
6.	<b>Settlement Monument Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> N/A
7.	<b>Groundwater Monitoring Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> N/A
8.	<b>Leachate Extraction Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> N/A
9.	<b>Discharge Compliance Records</b> <input type="checkbox"/> Air <input type="checkbox"/> Water (effluent) Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> N/A <input type="checkbox"/> N/A
10.	<b>Daily Access/Security Logs</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> N/A



<b>C. Institutional Controls (ICs)</b>				
1.	<b>Implementation and enforcement</b>			
	Site conditions imply ICs not properly implemented	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
	Site conditions imply ICs not being fully enforced	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
	Type of monitoring (e.g., self-reporting, drive by) _____			
	Frequency _____			
	Responsible party/agency <u>Union Pacific Railroad</u>			
	Contact _____			
	Name	Title	Date	Phone no.
	Reporting is up-to-date <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A			
	Reports are verified by the lead agency <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A			
	Specific requirements in deed or decision documents have been met <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A			
	Violations have been reported <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A			
	Other problems or suggestions: <input type="checkbox"/> Report attached			
	_____			
	_____			
	_____			
2.	<b>Adequacy</b>	<input checked="" type="checkbox"/> ICs are adequate	<input type="checkbox"/> ICs are inadequate	<input type="checkbox"/> N/A
	Remarks _____			
	_____			
<b>D. General</b>				
1.	<b>Vandalism/trespassing</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No vandalism evident	
	Remarks _____			
	_____			
2.	<b>Land use changes on site</b>	<input type="checkbox"/> N/A		
	Remarks <u>no changes</u>			
	_____			
3.	<b>Land use changes off site</b>	<input type="checkbox"/> N/A		
	Remarks <u>no changes</u>			
	_____			
<b>VI. GENERAL SITE CONDITIONS</b>				
<b>A. Roads</b>	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A		
1.	<b>Roads damaged</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Roads adequate	<input type="checkbox"/> N/A
	Remarks _____			
	_____			

<b>B. Other Site Conditions</b>			
Remarks <u>Site cleaned up for trespassers. does fence need to be maintained for Superfund? signs still needed for delisted site?</u>			
<u>Treatment system in fenced enclosure</u>			
<b>VII. LANDFILL COVERS</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
<b>A. Landfill Surface</b>			
1.	<b>Settlement</b> (Low spots) Areal extent _____ Depth _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Settlement not evident	
2.	<b>Cracks</b> Lengths _____ Widths _____ Depths _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Cracking not evident	
3.	<b>Erosion</b> Areal extent _____ Depth _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Erosion not evident	
4.	<b>Holes</b> Areal extent _____ Depth _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Holes not evident	
5.	<b>Vegetative Cover</b> <input type="checkbox"/> Grass <input type="checkbox"/> Cover properly established <input type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram) Remarks _____	<input type="checkbox"/> No signs of stress	
6.	<b>Alternative Cover</b> (armored rock, concrete, etc.) Remarks _____	<input type="checkbox"/> N/A	
7.	<b>Bulges</b> Areal extent _____ Height _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Bulges not evident	

8.	<b>Wet Areas/Water Damage</b> <input type="checkbox"/> Wet areas <input type="checkbox"/> Ponding <input type="checkbox"/> Seeps <input type="checkbox"/> Soft subgrade Remarks _____ _____	<input type="checkbox"/> Wet areas/water damage not evident <input type="checkbox"/> Location shown on site map    Areal extent _____ <input type="checkbox"/> Location shown on site map    Areal extent _____ <input type="checkbox"/> Location shown on site map    Areal extent _____ <input type="checkbox"/> Location shown on site map    Areal extent _____	
9.	<b>Slope Instability</b> <input type="checkbox"/> Slides <input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of slope instability Areal extent _____ Remarks _____ _____		
<b>B. Benches</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1.	<b>Flows Bypass Bench</b> Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A or okay	
2.	<b>Bench Breached</b> Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A or okay	
3.	<b>Bench Overtopped</b> Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A or okay	
<b>C. Letdown Channels</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1.	<b>Settlement</b> Areal extent _____    Depth _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of settlement	
2.	<b>Material Degradation</b> Material type _____    Areal extent _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of degradation	
3.	<b>Erosion</b> Areal extent _____    Depth _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of erosion	

4.	<b>Undercutting</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of undercutting
	Areal extent _____	Depth _____	
	Remarks _____		
<hr/>			
5.	<b>Obstructions</b>	Type _____	<input type="checkbox"/> No obstructions
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Size _____		
	Remarks _____		
<hr/>			
6.	<b>Excessive Vegetative Growth</b>	Type _____	
	<input type="checkbox"/> No evidence of excessive growth		
	<input type="checkbox"/> Vegetation in channels does not obstruct flow		
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Remarks _____		
<hr/>			
<b>D. Cover Penetrations</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
<hr/>			
1.	<b>Gas Vents</b>	<input type="checkbox"/> Active	<input type="checkbox"/> Passive
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration		<input type="checkbox"/> Needs Maintenance
	<input type="checkbox"/> N/A		
	Remarks _____		
<hr/>			
2.	<b>Gas Monitoring Probes</b>	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Routinely sampled	<input type="checkbox"/> Good condition
		<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
<hr/>			
3.	<b>Monitoring Wells (within surface area of landfill)</b>		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration		<input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A
	Remarks _____		
<hr/>			
4.	<b>Leachate Extraction Wells</b>	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Routinely sampled	<input type="checkbox"/> Good condition
		<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
<hr/>			
5.	<b>Settlement Monuments</b>	<input type="checkbox"/> Located	<input type="checkbox"/> Routinely surveyed <input type="checkbox"/> N/A
	Remarks _____		
<hr/>			

<b>E. Gas Collection and Treatment</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A		
1.	<b>Gas Treatment Facilities</b> <input type="checkbox"/> Flaring <input type="checkbox"/> Thermal destruction <input type="checkbox"/> Collection for reuse <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____	
2.	<b>Gas Collection Wells, Manifolds and Piping</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____	
3.	<b>Gas Monitoring Facilities (e.g., gas monitoring of adjacent homes or buildings)</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____	
<b>F. Cover Drainage Layer</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A		
1.	<b>Outlet Pipes Inspected</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
2.	<b>Outlet Rock Inspected</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
<b>G. Detention/Sedimentation Ponds</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A		
1.	<b>Siltation</b> Areal extent _____      Depth _____ <input type="checkbox"/> N/A <input type="checkbox"/> Siltation not evident Remarks _____ _____	
2.	<b>Erosion</b> Areal extent _____      Depth _____ <input type="checkbox"/> Erosion not evident Remarks _____ _____	
3.	<b>Outlet Works</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
4.	<b>Dam</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	

<b>H. Retaining Walls</b>		<input type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1.	<b>Deformations</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Deformation not evident
	Horizontal displacement _____	Vertical displacement _____	
	Rotational displacement _____		
	Remarks _____		
	_____		
2.	<b>Degradation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Degradation not evident
	Remarks _____		
	_____		
<b>I. Perimeter Ditches/Off-Site Discharge</b>		<input type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1.	<b>Siltation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Siltation not evident
	Areal extent _____	Depth _____	
	Remarks _____		
	_____		
2.	<b>Vegetative Growth</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A
	<input type="checkbox"/> Vegetation does not impede flow		
	Areal extent _____	Type _____	
	Remarks _____		
	_____		
3.	<b>Erosion</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Erosion not evident
	Areal extent _____	Depth _____	
	Remarks _____		
	_____		
4.	<b>Discharge Structure</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
	Remarks _____		
	_____		
<b>VIII. VERTICAL BARRIER WALLS</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Settlement</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Settlement not evident
	Areal extent _____	Depth _____	
	Remarks _____		
	_____		
2.	<b>Performance Monitoring</b>	Type of monitoring _____	
	<input type="checkbox"/> Performance not monitored		
	Frequency _____	<input type="checkbox"/> Evidence of breaching	
	Head differential _____		
	Remarks _____		
	_____		

<b>IX. GROUNDWATER/SURFACE WATER REMEDIES</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
<b>A. Groundwater Extraction Wells, Pumps, and Pipelines</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A	
1.	<b>Pumps, Wellhead Plumbing, and Electrical</b> <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells properly operating <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____ _____
2.	<b>Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	<b>Spare Parts and Equipment</b> <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____
<b>B. Surface Water Collection Structures, Pumps, and Pipelines</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	<b>Collection Structures, Pumps, and Electrical</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
2.	<b>Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	<b>Spare Parts and Equipment</b> <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____

<b>C. Treatment System</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Treatment Train</b> (Check components that apply)	<input type="checkbox"/> Metals removal <input type="checkbox"/> Air stripping <input type="checkbox"/> Filters <input type="checkbox"/> Additive ( <i>e.g.</i> , chelation agent, flocculent) <input type="checkbox"/> Others	<input type="checkbox"/> Oil/water separation <input type="checkbox"/> Carbon adsorbers <input type="checkbox"/> Bioremediation  <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> Sampling ports properly marked and functional <input type="checkbox"/> Sampling/maintenance log displayed and up to date <input type="checkbox"/> Equipment properly identified <input type="checkbox"/> Quantity of groundwater treated annually _____ <input type="checkbox"/> Quantity of surface water treated annually _____ Remarks _____
2.	<b>Electrical Enclosures and Panels</b> (properly rated and functional)	<input type="checkbox"/> N/A <input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance Remarks _____
3.	<b>Tanks, Vaults, Storage Vessels</b>	<input type="checkbox"/> N/A <input type="checkbox"/> Good condition	<input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs Maintenance Remarks _____
4.	<b>Discharge Structure and Appurtenances</b>	<input type="checkbox"/> N/A <input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance Remarks _____
5.	<b>Treatment Building(s)</b>	<input type="checkbox"/> N/A <input type="checkbox"/> Good condition ( <i>esp.</i> roof and doorways) <input type="checkbox"/> Chemicals and equipment properly stored	<input type="checkbox"/> Needs repair Remarks _____
6.	<b>Monitoring Wells</b> (pump and treatment remedy)	<input type="checkbox"/> Properly secured/locked <input type="checkbox"/> All required wells located	<input type="checkbox"/> Functioning <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> N/A Remarks _____
<b>D. Monitoring Data</b>			
1.	Monitoring Data	<input type="checkbox"/> Is routinely submitted on time	<input type="checkbox"/> Is of acceptable quality
2.	Monitoring data suggests:	<input type="checkbox"/> Groundwater plume is effectively contained	<input type="checkbox"/> Contaminant concentrations are declining

<b>D. Monitored Natural Attenuation</b>			
1.	<b>Monitoring Wells</b> (natural attenuation remedy) <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____ _____		
<b>X. OTHER REMEDIES</b>			
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.			
<b>XI. OVERALL OBSERVATIONS</b>			
<b>A. Implementation of the Remedy</b>			
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.). <i>Groundwater &amp; soil vapor extraction systems no longer needed as gw reached cleanup levels. Equipment remains on-site; <del>but</del> has not yet been removed.</i> _____ _____ _____ _____ _____ _____ _____			
<b>B. Adequacy of O&amp;M</b>			
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. <i>NA</i> _____ _____ _____ _____ _____ _____ _____			

<b>C. Early Indicators of Potential Remedy Problems</b>
Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. <u>NA</u> _____ _____ _____ _____ _____ _____ _____
<b>D. Opportunities for Optimization</b>
Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. <u>NA</u> _____ _____ _____ _____ _____ _____ _____

Attachment 3

## Applicable or Relevant and Appropriate Requirements (ARARs) Evaluation

### Western Pacific Railroad Superfund Site - Oroville, California Five-Year Review

PREPARED FOR: Holly Hadlock, US EPA Region 9

PREPARED BY: CH2M HILL, Inc on behalf of Union Pacific Railroad

DATE: August 8, 2008

This technical memorandum presents an evaluation of the applicable or relevant and appropriate requirements (ARARs) at the Western Pacific Railroad (WPRR) Superfund Site in Oroville, California.

#### ARARs Background

Section 121(d) of CERCLA requires that remedial actions implemented at CERCLA sites attain any Federal or more stringent State environmental standards, requirements, criteria, or limitations that are determined to be ARARs.

Applicable requirements are those cleanup standards, criteria, or limitations promulgated under Federal or State law that specifically address the situation at a CERCLA site. A requirement is applicable if specific terms or jurisdictional prerequisites of the law or regulation directly address the circumstances at the site.

If a requirement is not legally applicable, the requirement is evaluated to determine whether it is relevant and appropriate. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law that, while not applicable, address problems or situations sufficiently similar to the circumstances of the response actions and are well-suited to the conditions of the site. The criteria for determining relevance and appropriateness are listed in 40 CFR 300.400(g)(2).

Pursuant to EPA guidance, ARARs are classified into three categories: chemical-specific, location-specific, and action-specific requirements, defined below:

- **Chemical-specific ARARs** include those laws and requirements that regulate the release to the environment of materials possessing certain chemical or physical characteristics or containing specified chemical compounds. These requirements generally set health- or risk-based concentration limits or discharge limitations for specific hazardous substances. If, in a specific situation, a chemical is subject to more than one discharge or exposure limit, the more stringent of the requirements should generally be applied.

- **Location-specific ARARs** are those requirements that relate to the geographical or physical position of the site, rather than the nature of the contaminants or the proposed remedial actions. These requirements may limit the placement of remedial action, and may impose additional constraints on the cleanup action. For example, location-specific ARARs may refer to activities in the vicinity of wetlands, endangered species habitat, or areas of historical or cultural significance.
- **Action-specific ARARs** are requirements that apply to specific actions that may be associated with remediation. Action-specific ARARs often define acceptable handling, treatment, and disposal procedures for hazardous substances. These requirements are triggered by the particular remedial activities that are selected to accomplish a remedy. Examples of action-specific ARARs include requirements applicable to landfill closure, wastewater discharge, hazardous waste disposal, and emissions of air pollutants.

To-be-considered (TBC) criteria are requirements that may not meet the definition of an ARAR as described above but still may provide useful information or recommended procedures. TBC criteria are defined in 40 CFR 300.400(g)(3). Chemical-specific TBC requirements are applied in the absence of ARARs or when the existing ARARs are not sufficiently protective to develop cleanup levels. TBC documents are non-promulgated advisories or guidance issued by Federal or State government that are not legally binding but that may provide useful information or recommended procedures for remedial action. Although TBC criteria do not have the status of ARARs, they are considered together with ARARs to establish the required level of cleanup for protection of human health or the environment. The critical difference between a TBC and an ARAR is that one is not required to comply with or meet a TBC when deciding on a remedial action. However, once a TBC is adopted in the ROD, it becomes a performance standard that is enforceable and must be complied with.

### **WPRR Oroville Superfund Site Background**

The ARARs for the WPRR Oroville site were presented in the following documents. These documents were reviewed for any changes, additions, or deletions:

- ROD signed on September 30, 1997
- Five-Year Review signed on September 4, 2003

The purpose of this regulatory review is to determine if regulations promulgated since the issuance of the above-mentioned documents may now impact the protectiveness of the remedy on human health and the environment. In the preamble to the final National Contingency Plan, EPA states that it will not reopen remedy selection decisions contained in RODs (i.e., ARARs are normally frozen at the time of ROD signature) unless a new or modified requirement calls into question the protectiveness of the selected remedy (55 FR 8757, March 8, 1990).

Chemical-specific ARARs are summarized in Table 1, and action-specific ARARs are summarized in Table 2. No location-specific ARARs were identified in the ROD.

The current versions of the California Code of Regulations (CCR) and the Code of Federal Regulations (CFR) were consulted via the internet or in hardcopy for pertinent updates.

## **ARARs Review**

### **Review of Location-Specific ARARs**

No location-specific ARARs were identified in the 1997 ROD and 2003 Five-Year Review. No location-specific ARARs were identified during this review that would require a substantive change to the current remedy.

### **Review of Chemical-Specific ARARs**

A summary of chemical-specific ARARs is provided in Table 1. The specific regulations cited for each ARAR contained in Table 1 were reviewed for changes since the 1997 ROD and 2003 Five-Year Review were issued. The “Current Status” column indicates if each ARAR is now considered applicable, relevant and appropriate, or TBC.

### **Review of Action-Specific ARARs**

A summary of the action-specific ARARs are provided in Table 2. The specific regulations cited for each ARAR contained in Table 2 were reviewed for changes since the 1997 ROD and 2003 Five-Year Reviews were issued. In 2007 California promulgated the requirements for land use covenants. This is a new ARAR for the WPRR Site. The “Current Status” column indicates if each ARAR is now considered applicable, relevant and appropriate, or TBC.

**TABLE 1**  
 Chemical-Specific Applicable or Relevant and Appropriate Requirements  
 Western Pacific Railroad Superfund Site – Oroville, California

<b>Source</b>	<b>Citation</b>	<b>Description</b>	<b>1997 ROD</b>	<b>2003 Five-Yr Review</b>	<b>Status for 2008 Five Year Review</b>
Clean Air Act	National Emissions Standards, 40 CFR Part 61	Identifies and establishes emissions standards for specific chemicals.	Applicable	Applicable	Applicable
California Domestic Water Quality and Monitoring Regulations	California Safe Drinking Water Regulations, including 22 CCR 64431 and 64444	Contains provision for California domestic water quality; establishes MCLs for primary drinking water chemicals.	Not Specified	Not specified	Applicable
State Water Resources Control Board	Resolution 92-49, Paragraph III G	Establishes policies and procedures for investigation and cleanup and abatement of discharges. Among other requirements, dischargers must cleanup and abate the effects of discharges in a manner that promotes the attainment of either background water quality or the best water quality that is reasonable if background water quality cannot be restored.	Applicable	Applicable	Applicable

**TABLE 2**

Action-Specific Potential Applicable or Relevant and Appropriate Requirements  
 Western Pacific Railroad Superfund Site – Oroville, California

Source	Citation	Description	1997 ROD	2003 Five-Yr Review	Status for 2008 Five Year Review
California Air Resources Act	Health and Safety Code, Division 26, 39000 <i>et seq.</i>	In California, the authority for enforcing the standards established under the Clean Air Act has been delegated to the State. The program is administered by the local Air Quality Management District (AQMD).  Regulates both nonvehicular and vehicular sources of air contaminants in California. Emissions from heavy equipment and excavation dusts will need to comply with local AQMD standards.	Applicable	Applicable	Applicable
State Water Resources Control Board	Resolution 68-16	Requires that high quality groundwater and surface water be maintained to the maximum extent possible.  Also applies to reinjection of treated water into the aquifer. Stipulates that extracted water should be treated to non-detect prior to reinjection into the aquifer.	Applicable	Applicable	Applicable
California Hazardous Substances Account Act	Health and Safety Code, Division 20, Chapter 6.8, 25300, <i>et. Seq.</i>	Establishes state authority to cleanup hazardous substance releases.	Applicable	Applicable	Applicable
RCRA Hazardous Waste Determination	Title 22 CCR, 66261.21, 66261.22(a)(1), 66261.22(a)(2), 66261.23, and 66261.24(a)(1) or Article 4, Chapter 11	A hazardous waste is considered a RCRA hazardous waste if it exhibits any of the characteristics of ignitability, corrosivity, reactivity, or toxicity, or if it is listed as a hazardous waste. Most waste determinations will focus on whether the generated waste (e.g., contaminated soil, treatment residuals) could be classified as toxicity characteristic waste as defined by the contaminant concentrations.	Applicable	Applicable	Applicable

**TABLE 2**

Action-Specific Potential Applicable or Relevant and Appropriate Requirements  
 Western Pacific Railroad Superfund Site – Oroville, California

Source	Citation	Description	1997 ROD	2003 Five-Yr Review	Status for 2008 Five Year Review
California hazardous waste determination	Title 22 CCR 66261 et. seq	Wastes can be classified as non-RCRA, State-only hazardous wastes if they exceed the Soluble Threshold Limit Concentration (STLC) or Total Threshold Limit Concentration (TTLC) values.	Applicable	Applicable	Applicable
California Land Disposal Restrictions, Requirements for Generators	Title 22 CCR 66268 et seq.	<p>Compliance with land disposal regulation treatment standards is required if hazardous waste (e.g., contaminated soil) is placed on land.</p> <p>Prior to transporting for offsite disposal, hazardous waste must be characterized to determine whether land disposal restriction treatment standards apply and whether the waste meets the treatment standards. This information must be provided to the offsite facility with the first waste shipment.</p>	Applicable	Applicable	Applicable
Standards Applicable to Generators of Hazardous Waste	Title 22 CCR 66263 et seq	Requires appropriate disposal of RCRA wastes transported off-site.	Applicable	Applicable	Applicable
Requirements for land use covenants	Title 22 CCR 67391.1 (Operative as of 11/17/07)	<p>Expressly authorizes use of institutional controls when residual contamination remains at the property at levels which are not suitable for unrestricted use of the land.</p> <p>In the event of a property transfer, requires the land-owners and their successors to enter into restrictive land use covenants with the State.</p>	Not promulgated	Not promulgated	Applicable

## Summary of Changes to Existing ARARs

A review of these existing ARARs indicates that, to date, there have been no significant changes or updates that would affect the applicability of ARARs identified in the ROD. Therefore, the ARARs remain applicable or relevant and appropriate as specified by “Status for 2008 Five Year Review” in Tables 1 and 2.

In addition, as identified in Tables 1 and 2, the following regulation, while not new since the 2003 Five-Year Review, is related to site activities and should be included as an ARAR:

- California Safe Drinking Water Regulations. Substantive requirements of 22 CCR 6444 are applicable. Establishes maximum contaminant levels (MCLs) for organic chemicals for public water supply.

The following regulation is new and became operative on 11/17/02. It is related to site activities and should be included as an ARAR:

- California Requirements for Land Use Covenants. Substantive requirements of 22 CCR 67391.1 are applicable. Expressly authorizes the use of institutional controls when residual contamination remains above levels allowing for unrestricted use of the land. Lists the sections of California law that land use covenants must comply with.

No location-specific ARARs were identified for the site during the 1997 ROD or recommended as part of the subsequent five-year review, and none have been identified for during this five-year review.

Notably, the drinking water standards, including State and Federal maximum contaminant levels (MCLs), are applicable chemical-specific ARARs and must be met. The MCLs are specified in 40 CFR Part 141 (Federal) and 22 CCR Sections 64444 and 64449 (State). Table 3 identifies the current Federal and State MCLs. The more stringent State MCLs for volatile organic compounds (VOCs) are applicable.

**TABLE 3**

Chemical-Specific MCLs for Contaminants of Concern (COCs)  
Western Pacific Railroad Superfund Site – Oroville, California

COC	Federal MCL (2003 Five- Year Review) (ug/L)	Federal MCL (Dec 10, 2007) (ug/L)	CA State MCL (2003 Five- Year Review) (ug/L)	CA State MCL (Feb 26, 2008) (ug/L)	Comments
Trichloroethylene (TCE)	5	5	5	5	
1,1-dichloroethane (1,1-DCA)	n/a	n/a	5	5	
1,1-dichloroethene (1,1-DCE)	7	7	6	6	
1,1,1-trichloroethane (1,1,1-TCA)	200	200	200	200	