

State Water Resources Control Board

UST CASE CLOSURE SUMMARY

Agency Information

Agency Name: North Coast Regional Water Quality Control Board	Address: 5550 Skylane Boulevard, Suite A Santa Rosa, CA 95403
Agency Caseworker: Mr. Cody Walker	Case No.: 1TSI006

Case Information

USTCF Claim No.: Not applicable	Global ID: T0609300005
Site Name: California Department of Transportation (CDOT), Dorris Station	Site Address: State Highway 97, Post Mile 49.8, Dorris (Site)
Petitioner: California Department of Transportation Attention: Mr. Arron Rambach	Address: CALTRANS District 3, P.O. Box 911, Marysville, CA 95901
USTCF Expenditures to Date: \$0	Number of Years Case Open: 25

URL: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0609300005

Summary

The Low-Threat Underground Storage Tank Case Closure Policy (Policy) contains general and media-specific criteria, and cases that meet those criteria are appropriate for closure pursuant to the Low-Threat Policy. This Case meets all of the required criteria of the Policy. A summary evaluation of compliance with the Policy is shown in **Attachment 1: Compliance with State Water Board Policies and State Law**. The Conceptual Site Model upon which the evaluation of the Case has been made is described in **Attachment 2: Summary of Basic Site Information**. Highlights of the Conceptual Site Model of the Case are as follows:

The release at the Site was discovered when the former underground storage tanks (UST) and fuel pump were removed from the Site in August 1987. During the 1987 UST removal, approximately 60 cubic yards of impacted soil were excavated and disposed. Free product existed in one monitoring well (MW) from 1998 to 2001. A potential receptor survey identified two domestic (DOM) wells located within 2,000 feet of the site. The Gamboa Residence DOM well is located approximately 400 feet to the south-southwest (cross-gradient), and the Mayes DOM well is located greater than 1,000 feet to the southeast (down-gradient). Both DOM wells were sampled in May 2000 for petroleum constituents and volatile organic compounds (VOCs) and sample results were reported as non-detect. Soil Vapor Extraction (SVE) and Air-Sparge (AS) systems were operated from March 2003 to April 2005 and again from January to August 2008. The SVE system operations were terminated in 2008 with Regional Water Quality Control Board (Regional Water Board) concurrence. The contamination plume is stable to decreasing since termination of the SVE system in 2008.

The petroleum release is limited to the shallow soil and groundwater within the Site boundary. The affected groundwater beneath the Site is not currently being used as a source of drinking water or for any other designated beneficial use, and it is highly unlikely that the affected groundwater will be used as a source of drinking water or for any other beneficial use in the foreseeable future. Public supply wells are usually constructed with competent sanitary seals and intake screens that are in deeper more protected aquifers. Remaining petroleum constituents are limited, stable and declining. Remedial actions have been implemented and further remediation would be ineffective and expensive. Additional assessment/monitoring will not likely change the conceptual model. Any remaining petroleum constituents do not pose significant risk to human health, safety or the environment.

Rationale for Closure under the Policy

- General Criteria – Site **MEETS ALL EIGHT GENERAL CRITERIA** under the Policy.
- Groundwater Media-Specific Criteria – Site meets the criterion in **CLASS 5**. Based on an analysis of Site specific conditions that under current and reasonably anticipated near-term future scenarios, the contaminant plume poses a low threat to human health and safety and to the environment and water quality objectives (WQOs) will be achieved within a reasonable time frame.
- Petroleum Vapor Intrusion to Indoor Air – Site meets **CRITERIA (2) a, Scenario 3**. Benzene in groundwater is less than (<) 100 micrograms per liter ($\mu\text{g/L}$); total petroleum hydrocarbons (TPH) is <100 milligrams per kilogram (mg/kg) in soil at depths less than 5 feet.
- Direct Contact and Outdoor Air Exposure – Site meets **CRITERIA (3) a**. Maximum concentrations of petroleum constituents in soil are less than or equal to those listed in Table 1. The estimated naphthalene concentrations in soil meet the thresholds in Table 1 and the Policy criteria for direct contact by a factor of eight. It is highly unlikely that naphthalene concentrations in the soil, if any, exceed the threshold.

Objections to Closure

Regional Water Board staff objected to UST case closure because:

1. Natural attenuation has not been established.
RESPONSE: Post remediation groundwater data show decreasing trends in petroleum hydrocarbon concentrations. Additionally, cross- and down-gradient monitoring wells that historically had groundwater detections, no longer have detections in groundwater. Both of these conditions demonstrate that natural attenuation is occurring.
2. WQOs will not be reached in 5 to 100 years; existing data do not adequately project when WQOs will be achieved.
RESPONSE: Groundwater monitoring analytical data indicate that residual concentrations of total petroleum hydrocarbons as gasoline (TPHg) and benzene exist above WQOs. However, post remediation groundwater data indicate decreasing petroleum hydrocarbon trends in groundwater.

CDOT Dorris Station
State Highway 97, Post Mile 49.8, Dorris

3. An updated sensitive receptor survey is required.

RESPONSE: An updated sensitive receptor survey was provided in the Second Quarter – 2011 Groundwater Monitoring Report, dated September 2011. The Regional Water Board letter dated, October 4, 2011, acknowledged receipt of the updated sensitive receptor survey and did not dispute the information provided.

Recommendation for Closure

The corrective action performed at this Site ensures the protection of human health, safety, the environment and is consistent with Chapter 6.7 of the Health and Safety Code and implementing regulations, applicable state policies for water quality control and the applicable water quality control plan, and case closure is recommended.

Prepared By: Steve McMasters
Steve McMasters, PG No. 8054
Engineering Geologist

3/28/2013
Date

Reviewed By: Benjamin Heningburg
Benjamin Heningburg, PG No. 8130
Senior Engineering Geologist

3/28/2013
Date

ATTACHMENT 1: COMPLIANCE WITH STATE WATER BOARD POLICIES AND STATE LAW

The site complies with State Water Resources Control Board policies and state law. Section 25296.10 of the Health and Safety Code requires that sites be cleaned up to protect human health, safety, and the environment. Based on available information, any residual petroleum constituents at the site do not pose significant risk to human health, safety, or the environment.

The site complies with the requirements of the Low-Threat Underground Storage Tank (UST) Case Closure Policy as described below.¹

<p>Is corrective action consistent with Chapter 6.7 of the Health and Safety Code and implementing regulations? The corrective action provisions contained in Chapter 6.7 of the Health and Safety Code and the implementing regulations govern the entire corrective action process at leaking UST sites. If it is determined, at any stage in the corrective action process, that UST case closure is appropriate, further compliance with corrective action requirements is not necessary. Corrective action at this site has been consistent with Chapter 6.7 of the Health and Safety Code and implementing regulations and, since this case meets applicable case-closure requirements, further corrective action is not necessary, unless the activity is necessary for case closure.</p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>Have waste discharge requirements or any other orders issued pursuant to Division 7 of the Water Code been issued at this site?</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
<p>If so, was the corrective action performed consistent with any order?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</p>
<p><u>General Criteria</u> General criteria that must be satisfied by all candidate sites:</p> <p>Is the unauthorized release located within the service area of a public water system?</p> <p>Does the unauthorized release consist only of petroleum?</p> <p>Has the unauthorized (“primary”) release from the UST system been stopped?</p> <p>Has free product been removed to the maximum extent practicable?</p> <p>Has a conceptual site model that assesses the nature, extent, and mobility of the release been developed?</p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>

¹ Refer to the Low-Threat Underground Storage Tank Case Closure Policy for closure criteria for low-threat petroleum UST sites.

<p>Has secondary source been removed to the extent practicable?</p> <p>Has soil or groundwater been tested for MTBE and results reported in accordance with Health and Safety Code Section 25296.15?</p> <p>Does nuisance as defined by Water Code section 13050 exist at the site?</p> <p>Are there unique site attributes or site-specific conditions that demonstrably increase the risk associated with residual petroleum constituents?</p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
<p><u>Media-Specific Criteria</u> Candidate sites must satisfy all three of these media-specific criteria:</p> <p>1. Groundwater: To satisfy the media-specific criteria for groundwater, the contaminant plume that exceeds water quality objectives must be stable or decreasing in areal extent, and meet all of the additional characteristics of one of the five classes of sites:</p> <p>Is the contaminant plume that exceeds water quality objectives stable or decreasing in areal extent?</p> <p>Does the contaminant plume that exceeds water quality objectives meet all of the additional characteristics of one of the five classes of sites? If YES, check applicable class: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> 5</p> <p>For sites with releases that have not affected groundwater, do mobile constituents (leachate, vapors, or light non-aqueous phase liquids) contain sufficient mobile constituents to cause groundwater to exceed the groundwater criteria?</p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</p>
<p>2. Petroleum Vapor Intrusion to Indoor Air: The site is considered low-threat for vapor intrusion to indoor air if site-specific conditions satisfy all of the characteristics of one of the three classes of sites (a through c) or if the exception for active commercial fueling facilities applies.</p> <p>Is the site an active commercial petroleum fueling facility? Exception: Satisfaction of the media-specific criteria for petroleum vapor intrusion to indoor air is not required at active commercial petroleum fueling facilities, except in cases where release characteristics can be reasonably believed to pose an unacceptable health risk.</p> <p>a. Do site-specific conditions at the release site satisfy all of the applicable characteristics and criteria of scenarios 1 through 3 or all of the applicable characteristics and criteria of scenario 4? If YES, check applicable scenarios: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4</p> <p>b. Has a site-specific risk assessment for the vapor intrusion pathway been conducted and demonstrates that human health is protected to the satisfaction of the regulatory agency?</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</p>

<p>c. As a result of controlling exposure through the use of mitigation measures or through the use of institutional or engineering controls, has the regulatory agency determined that petroleum vapors migrating from soil or groundwater will have no significant risk of adversely affecting human health?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</p>
<p>3. Direct Contact and Outdoor Air Exposure: The site is considered low-threat for direct contact and outdoor air exposure if site-specific conditions satisfy one of the three classes of sites (a through c).</p> <p>a. Are maximum concentrations of petroleum constituents in soil less than or equal to those listed in Table 1 for the specified depth below ground surface (bgs)?</p> <p>b. Are maximum concentrations of petroleum constituents in soil less than levels that a site specific risk assessment demonstrates will have no significant risk of adversely affecting human health?</p> <p>c. As a result of controlling exposure through the use of mitigation measures or through the use of institutional or engineering controls, has the regulatory agency determined that the concentrations of petroleum constituents in soil will have no significant risk of adversely affecting human health?</p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</p>

ATTACHMENT 2: SUMMARY OF BASIC INFORMATION (Conceptual Site Model)

Site Location/ History

- The Site is located approximately one-quarter mile south of the Town of Dorris along Highway 97. The Site is used by CDOT as a maintenance yard with storage buildings.
- The Site is bounded by Highway 97 and agricultural land to the east, commercial to the west, Siskiyou County Road Department to the north, and California Agriculture Inspection Station to the south.
- Nature of Contaminants of Concern: Petroleum hydrocarbons only.
- Primary Source of Release: UST system
- Discovery Date: 1987
- Release Type: Petroleum²
- Free Product: From 1998 to 2001, MW-3 contained free product, but not after 2001.

Table A. USTs:

Tank No.	Size	Contents	Status	Date
1	1,000 gallon	Gasoline	Removed	1987
2	550 gallon	Diesel	Removed	1987

Receptors

- Groundwater Basin: Butte Valley (1-3)
- Groundwater Beneficial Uses: Municipal and domestic supply (MUN); agricultural supply (AGR); hydropower generation (POW); water contact recreation (REC1); non-contact water recreation (REC2); commercial and sport fishing (COMM); warm fresh water habitat (WARM); cold fresh water habitat (COLD); wildlife habitat (WILD); rare, threatened, or endangered species (RARE); migration of aquatic organisms (MIGR); spawning, reproduction, and/or early development (SPWN); industrial service supply (IND); industrial process supply (PRO); and aquaculture (AQUA).
- Designated Land Use: General commercial (GC)
- Public Water System: City of Dorris
- Distance to Nearest Surface Waters: Wastewater treatment ponds are located approximately 1,000 feet to the northwest; unnamed man-made ponds and irrigation ditch located approximately 1 mile to the south and west of the site.
- Distance to Nearest Supply Wells: DOM wells are located approximately 400 feet to the south-southwest and approximately 1,600 feet to the southeast.

Geology/ Hydrogeology

- Average Groundwater Depth: ~22 feet bgs
- Minimum Groundwater Depth: ~21 feet bgs
- Groundwater Flow Direction: Southeast
- Geology: Site overlies alluvial deposits of clay, silt, and silty-sand with minor amounts of sand and gravel units.
- Hydrogeology: Groundwater beneath the site is unconfined.

² "Petroleum" means crude oil, or any fraction thereof, which is liquid at standard conditions of temperature and pressure, which means at 60 degrees Fahrenheit and 14.7 pounds per square inch absolute. (Health & Saf. Code, § 25299.2.)

Corrective Actions

- Two USTs and fuel pump were removed from facility in 1987.
- During the 1987 UST system removal, approximately 60 cubic yards of impacted soil were removed and disposed.
- SVE and AS remediation systems were operated at the site from 2003 to 2005 and from January to August 2008.
- The remediation systems were terminated to evaluate rebound and was removed from the site in 2011 with Regional Water Board concurrence.

Table B. Concentrations of Petroleum Constituents in Soil

Constituent	Maximum 0-5 feet bgs (mg/kg)	Maximum 5-10 feet bgs (mg/kg)
Benzene	<0.005	<0.005
Ethylbenzene	<0.005	0.049
Naphthalene	Not Analyzed	Not Analyzed
PAHs*	Not Analyzed	Not Analyzed

*Poly-aromatic hydrocarbons as benzo(a)pyrene toxicity equivalent

Table C. Concentrations of Petroleum Constituents in Groundwater (June 2012)

Well ID	DTW	TPHg	TPHd	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
MW-1*	23.20	--	--	--	--	--	--	--
MW-2*	23.07	--	--	--	--	--	--	--
MW-3	23.75	60	200	1.1	<0.5	0.63	<1.0	<0.5
MW-4	23.39	<50	<50	<0.5	<0.5	<0.5	<1.0	--
MW-5	22.64	<50	<50	<0.5	<0.5	<0.5	<1.0	--
MW-6	23.11	60	60	<0.5	<0.5	<0.5	<1.0	--
MW-7*	23.32	--	--	--	--	--	--	--
MW-8	23.35	640	560	2.9	<0.5	11	1.3	<0.5
MW-9	23.65	<50	<50	<0.5	<0.5	<0.5	<1.0	--
MW-10	24.02	<50	<50	<0.5	<0.5	<0.5	<1.0	--
MW-11	22.80	<50	<50	<0.5	<0.5	<0.5	<1.0	--
WQOs		50	50	1	42	3.2	17	5

Notes:

*Analysis discontinued per Regional Water Board request

bold indicates that sample result exceeds WQOs

DTW – depth to water

TPHg – Total petroleum hydrocarbons as gasoline

TPHd – Total petroleum hydrocarbons as diesel

MTBE- Methyl tert-butyl ether

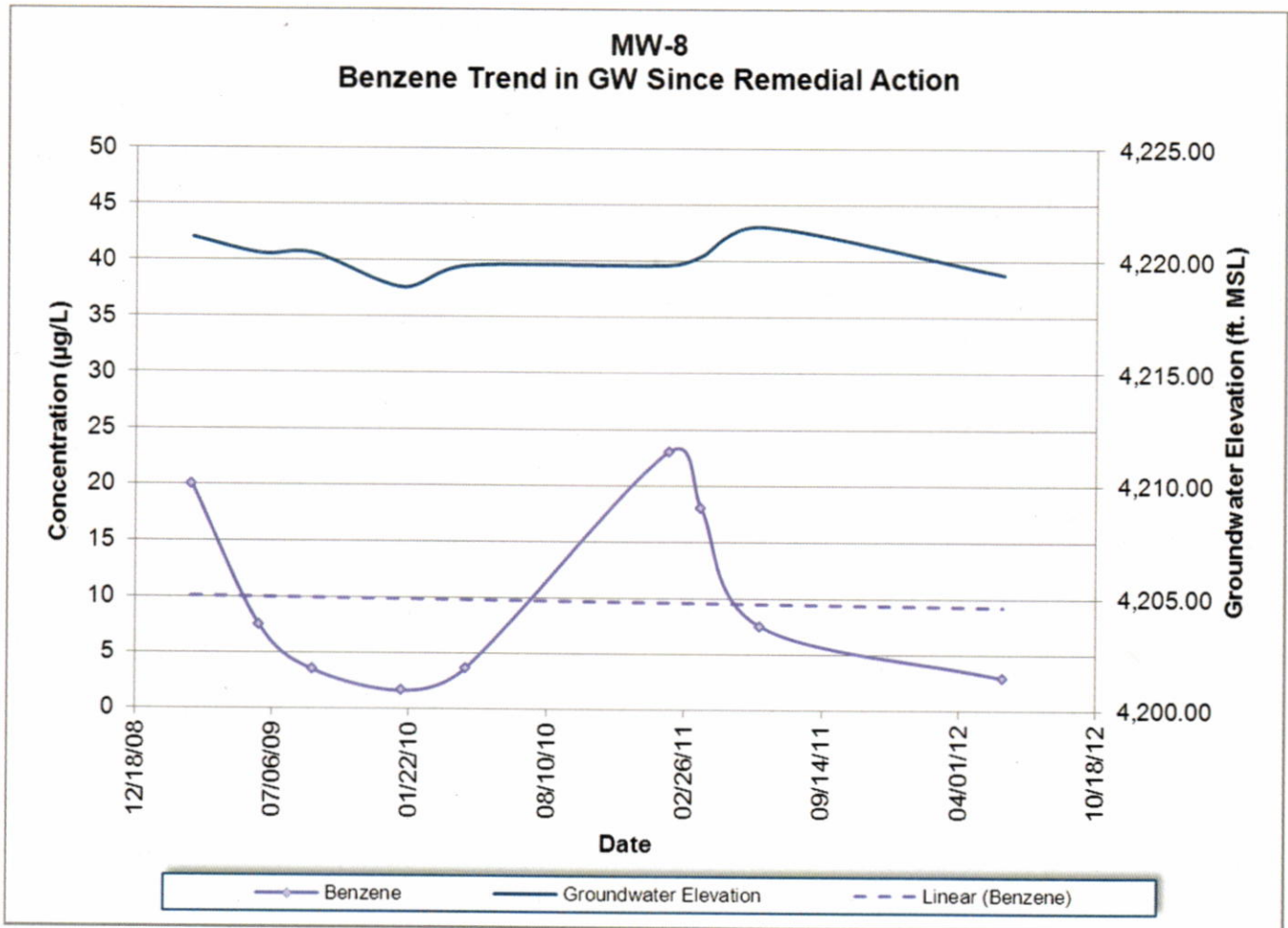
µg/L – micrograms per liter

"<" – indicates result is below the laboratory reporting limit

"--" – constituent not analyzed

Groundwater Trends:

Reported concentrations of benzene at the Site have demonstrated stable or decreasing trends over time since remediation was ceased.



Evaluation of Risk Criteria

- Maximum Petroleum Constituent Plume Length above WQOs: The groundwater plume is approximately 160 feet in length.
- Petroleum Constituent Plume Determined Stable or Decreasing: Yes
- Soil/Groundwater Sampled for MTBE: Yes, see Table C above
- Residual Petroleum Constituents Pose Significant Risk to the Environment: No
- Residual Petroleum Constituents Pose Significant Vapor Intrusion Risk to Human Health: No – Petroleum constituents most likely to pose a threat for vapor intrusion were removed during soil excavation and over-excavation. Site conditions demonstrate that the residual petroleum constituents in soil and groundwater are protective of human health.
- Residual Petroleum Constituents Pose a Nuisance³ at the Site: No

³ Nuisance as defined in California Water Code, section 13050, subdivision (m).

- Residual Petroleum Constituents in Soil Pose Significant Risk of Adversely Affecting Human Health: No. Site-specific conditions satisfy all of the applicable characteristics and criteria for petroleum vapor intrusion to indoor-air under class a. scenario 3.
- Residual Petroleum Constituents Pose Significant Direct Contact and Outdoor Air Exposure to Human Health: No – There are no soil samples results in the case record for naphthalene. However, the relative concentration of naphthalene in soil can be conservatively estimated using the published relative concentrations of naphthalene and benzene in gasoline. Taken from Potter and Simmons (1998), gasoline mixtures contain approximately 2% benzene and 0.25% naphthalene. Therefore, benzene concentrations can be directly substituted for naphthalene concentrations with a safety factor of eight. Benzene concentrations from the Site are below the naphthalene thresholds in Table 1 of the Policy. Therefore, estimated naphthalene concentrations meet the thresholds in Table 1 and the Policy criteria for direct contact by a factor of eight. It is highly unlikely that naphthalene concentrations in the soil, if any, exceed the threshold.

CDOT Dorris Station
 State Highway 97, Post Mile 49.8, Dorris

DWQP-0182
 Benzene in Groundwater
 (µg/L)
 June 2012
 CDOT Dorris Station

