

State Water Resources Control Board

UST CASE CLOSURE REVIEW SUMMARY REPORT

Agency Information

Agency Name: Stanislaus County Environmental Resources Department (County)	Address: 3800 Cornucopia Way, Suite C, Modesto, CA 95358
Agency Caseworker: Amber Minami	Case No.: 162

Case Information

USTCF Claim No.: 260	Global ID: T0609900191
Site Name: Stop N Save #4	Site Address: 825 East Main Street, Turlock, CA 95380
Responsible Party (RP): C.W. Brower, Inc.	Address: 413 Riverside Drive, Suite A, Modesto, CA 95354
USTCF Expenditures to Date: \$508,616	Number of Years Case Open: 21

URL: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0609900191

Summary

The Low-Threat Underground Storage Tank (UST) Case Closure Policy (Policy) contains general and media-specific criteria, and cases that meet those criteria are appropriate for closure pursuant to the 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 Case Information (Conceptual Site Model)**. Highlights of the case follow:

The Site is an active gas station. An unauthorized leak was reported in September 1991. One 10,000-gallon gasoline UST has been removed. Soil vapor extraction, ozone injection, and dual phase extraction have all been conducted at the Site. Ozone injection is on-going. Dual phase extraction efforts removed only 0.4 pounds/day of petroleum hydrocarbons and the technology was determined to be ineffective. The effectiveness of the other utilized remedial approaches at removing significant petroleum hydrocarbon contamination at the Site is unclear. According to groundwater data, water quality objectives (WQO) have been achieved for all constituents except for TPHg, benzene, and ethylbenzene at one on-site monitoring well. All other monitoring wells show TPHg and benzene near the WQO.

The petroleum release is limited to the shallow soil and groundwater. No public supply wells regulated by the California Department of Public Health (CDPH) or surface water bodies are within 250 feet of a defined plume boundary. No other water supply wells were identified within 250 feet of the defined plume boundary in files reviewed. Water is provided to water users near the Site by the Turlock Irrigation District. The affected groundwater is not currently being used as a source of drinking water, and it is highly unlikely that the affected groundwater will be used as a source of drinking water in the foreseeable future.

Other designated beneficial uses of impacted groundwater are not threatened, and it is highly unlikely that they will be, considering these factors in the context of the site setting. Remaining petroleum hydrocarbon constituents are limited, stable and concentrations declining. Corrective actions have been implemented and additional corrective actions are not necessary. Any remaining petroleum hydrocarbon constituents do not pose a significant risk to human health, safety or the environment.

Rationale for Closure under the Policy

- **General Criteria:** The case meets all eight Policy general criteria.
- **Groundwater:** The case meets Policy Groundwater-Specific Criterion 1 by Class 1. The contaminant plume that exceeds WQO is less than 100 feet in length. No free product is present. The nearest water supply well or surface water body is greater than 250 feet from the defined plume boundary.
- **Vapor Intrusion to Indoor Air:** Policy Exclusion for Active Station - Soil vapor evaluation is not required because Site is an active commercial petroleum fueling facility.
- **Direct Contact and Outdoor Air Exposure:** The case meets Policy Criterion 3a. Maximum concentrations in soil are less than those in Policy Table 1 for both Commercial/Industrial land use and Residential land use and the concentration limits for Utility Worker are satisfied. Site pavement prevents direct contact. Shallow soil samples collected did not contain benzene or ethylbenzene above method detection limits. There are no soil sample 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 percent benzene and 0.25 percent naphthalene. Therefore, benzene can be directly substituted for naphthalene concentrations with a safety factor of eight. Benzene concentrations from the Site are below the naphthalene thresholds in Policy Table 1. Therefore, the 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.

Objections to Closure and Responses

By June 21, 2011 letter, the County objected to UST case closure for this case because:

- **Necessary remedial action was pending at that time.**
RESPONSE: Remediation has been ongoing. Further remediation is unnecessary to achieve WQO. The case meets all Policy criteria and does not pose a significant risk to human health.
- **Remedial action pilot test results had not been received.**
RESPONSE: Soil vapor extraction, ozone injection, and dual phase extraction have all been conducted at the Site. Ozone injection is on-going. Dual phase extraction efforts removed only 0.4 pounds/day of petroleum hydrocarbons and the technology was determined to be ineffective. The effectiveness of the other utilized remedial approaches at removing significant petroleum hydrocarbon contamination at the Site is unclear. Further remediation is unnecessary to achieve WQO. Case meets all Policy criteria and does not pose a significant risk to human health.

Determination

Based on the review performed in accordance with Health & Safety Code Section 25299.39.2 subdivision (a), the Fund Manager has determined that closure of the case is appropriate.

Stop N Save #4
825 East Main Street, Turlock
Claim No. 260

February 2013

Recommendation for Closure

Based on available information, residual petroleum hydrocarbons at the Site do not pose a significant risk to human health, safety, or the environment, and the case meets the requirements of the Policy. Accordingly, the Fund Manager recommends that the case be closed. The State Water Board is conducting public notification as required by the Policy. Stanislaus County has the regulatory responsibility to supervise the abandonment of monitoring wells.

Lisa Babcock

Lisa Babcock, P.G. 3939, C.E.G. 1235

2/25/13

Date

Prepared by: Kirk Larson, P.G.

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

Site Location/History

- The Site is located at 825 East Main Street in Turlock and is an active retail gasoline station.
- The Site is bounded by residences to the southwest and northwest, a business to the northeast and East Main Street to the southeast. The surrounding land use is mixed residential and commercial.
- Nine monitoring wells have been installed and monitored regularly since 1992.
- A Site map showing the location of the current and former USTs, monitoring wells and groundwater level contours is provided at the end of this review summary.
- Nature of Contaminants of Concern: Petroleum hydrocarbons only.
- Source: UST system.
- Date reported: September 1991.
- Status of Release: USTs replaced.
- Free Product: None reported.

Tank Information

Tank No.	Size in Gallons	Contents	Closed in Place/ Removed/Active	Date
1	10,000	Gasoline	Removed	NA
2	10,000	Gasoline	Active	
3	5,000	Gasoline	Active	

NA: Not Available

Receptors

- GW Basin: San Joaquin Valley – Turlock.
- Beneficial Uses: Municipal and domestic water supply.
- Land Use Designation: Commercial.
- Public Water System: Turlock Irrigation District, PO Box 1526, Turlock, CA 95381, (209-668-5590).
- Distance to Nearest Supply Well: According to data available in GeoTracker, there are no public supply wells regulated by CDPH within 250 feet of the define plume boundary. No other water supply wells were identified within 250 feet of the defined plume boundary in files reviewed.
- Distance to Nearest Surface Water: There is no identified surface water within 250 feet of the defined plume boundary.

Geology/Hydrogeology

- Stratigraphy: The Site is underlain by interbedded and intermixed sand and silt.
- Maximum Sample Depth: 15 feet below ground surface (bgs).
- Minimum Groundwater Depth: 8.99 feet bgs at monitoring well MW-7.
- Maximum Groundwater Depth: 15.34 feet bgs at monitoring well MW-11.
- Current Average Depth to Groundwater: Approximately 15 feet bgs.
- Saturated Zones(s) Studied: Approximately 9-25 feet bgs.
- Groundwater Flow Direction: Southwest at approximately 0.0016 feet/foot (July 2012).

Monitoring Well Information

Well Designation	Date Installed	Screen Interval (feet bgs)	Depth to Water (feet bgs) (06/07/2012)
MW-1	Feb 92	9-24	14.97
MW-3	Feb 92	9-24	14.64
MW-4	Nov 92	13-23	14.51
MW-5	Nov 92	12-24	15.09
MW-6	Mar 93	?-25	14.85
MW-7	Mar 93	?-23	13.40
MW-8	Mar 93	?-23	14.88
MW-10	Dec 93	?-25	14.90
MW-11	Sep 06	10-25	15.12

Remediation Summary

- Free Product: No free product was documented in GeoTracker.
- Soil Excavation: Unknown.
- In-Situ Soil/Groundwater Remediation: Soil vapor extraction, ozone injection, and dual phase extraction have all been conducted at the Site. Ozone injection is on-going. Dual phase extraction efforts removed only 0.4 pounds/day of petroleum hydrocarbons and the technology was determined to be ineffective (Apex, 2012). The effectiveness of the other utilized remedial approaches at removing significant petroleum hydrocarbon contamination at the Site is unclear.

Most Recent Concentrations of Petroleum Constituents in Soil

Constituent	Maximum 0-5 feet bgs [mg/kg and (date)]	Maximum 5-10 feet bgs [mg/kg and (date)]
Benzene	<0.005 (04/06/11)	<0.005 (01/18/08)
Ethylbenzene	<0.005 (04/06/11)	<0.005 (01/18/08)
Naphthalene	NA	NA
PAHs	NA	NA

NA: Not Analyzed, Not Applicable or Data Not Available

mg/kg: milligrams per kilogram, parts per million

<: Not detected at or above stated reporting limit

PAHs: Polycyclic aromatic hydrocarbons

Most Recent Concentrations of Petroleum Constituents in Groundwater

Sample	Sample Date	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-Benzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)
MW-1	06/07/2012	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5
MW-3	06/07/2012	2,600	34	2.1	190	7.7	<2	<20
MW-4	06/07/2012	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5
MW-5	06/07/2012	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5
MW-6	06/07/2012	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5
MW-7	06/07/2012	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5
MW-8	06/07/2012	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5
MW-10	06/07/2012	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5
MW-11	06/07/2012	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5
WQOs	-	5	0.15	42	29	17	5	1,200^a

NA: Not Analyzed, Not Applicable or Data Not Available

µg/L: micrograms per liter, parts per billion

<: Not detected at or above stated reporting limit

TPHg: Total petroleum hydrocarbons as gasoline

MTBE: Methyl tert-butyl ether

TBA: Tert-butyl alcohol

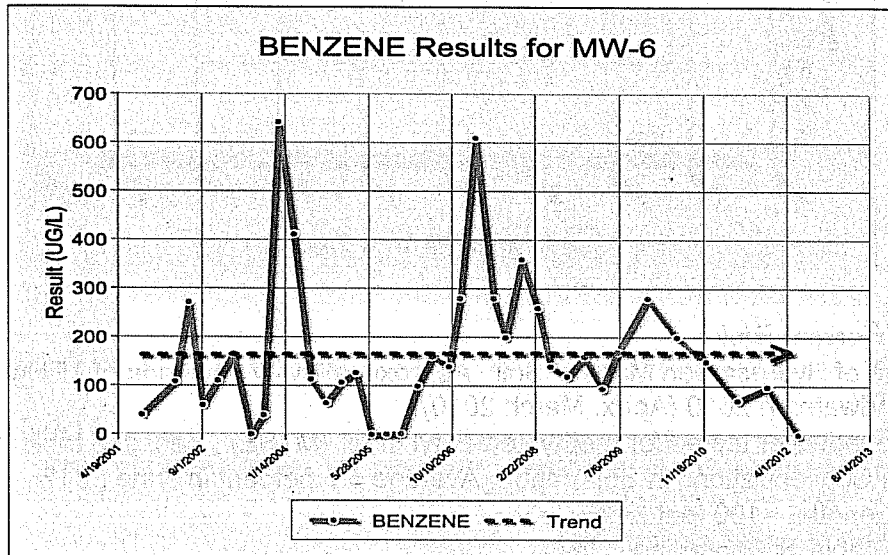
WQOs: Water Quality Objectives, Region 5 Basin Plan

^a: California Department of Public Health, Response Level

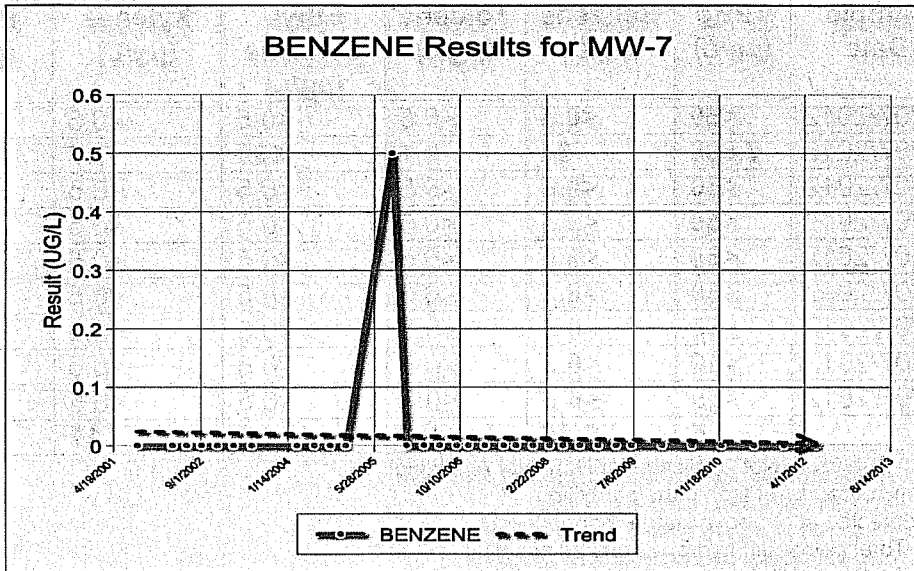
Groundwater Trends:

- There are more than 20 years of groundwater monitoring data for this Site. Benzene trends are shown below: Near Source Area (MW-6), Near Downgradient (MW-7), and Far Downgradient (MW-5).

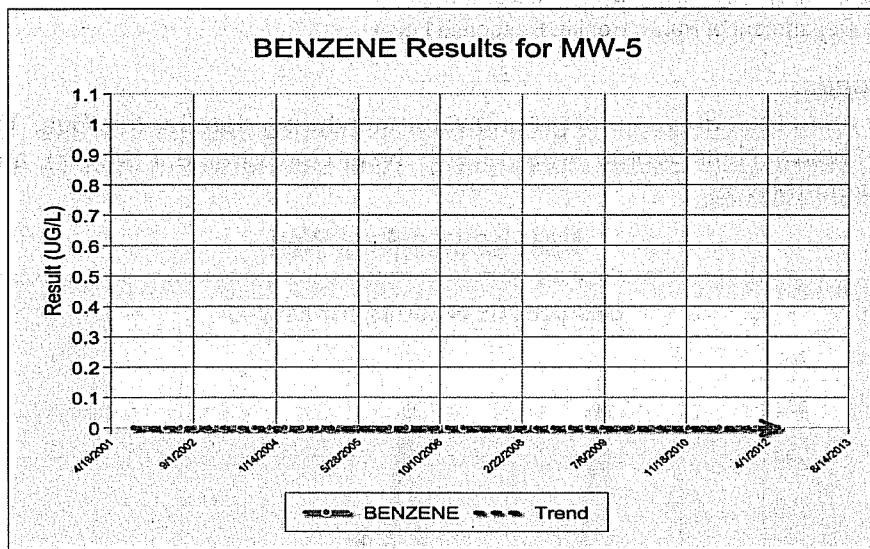
Near Source Area Well



Near Downgradient Well



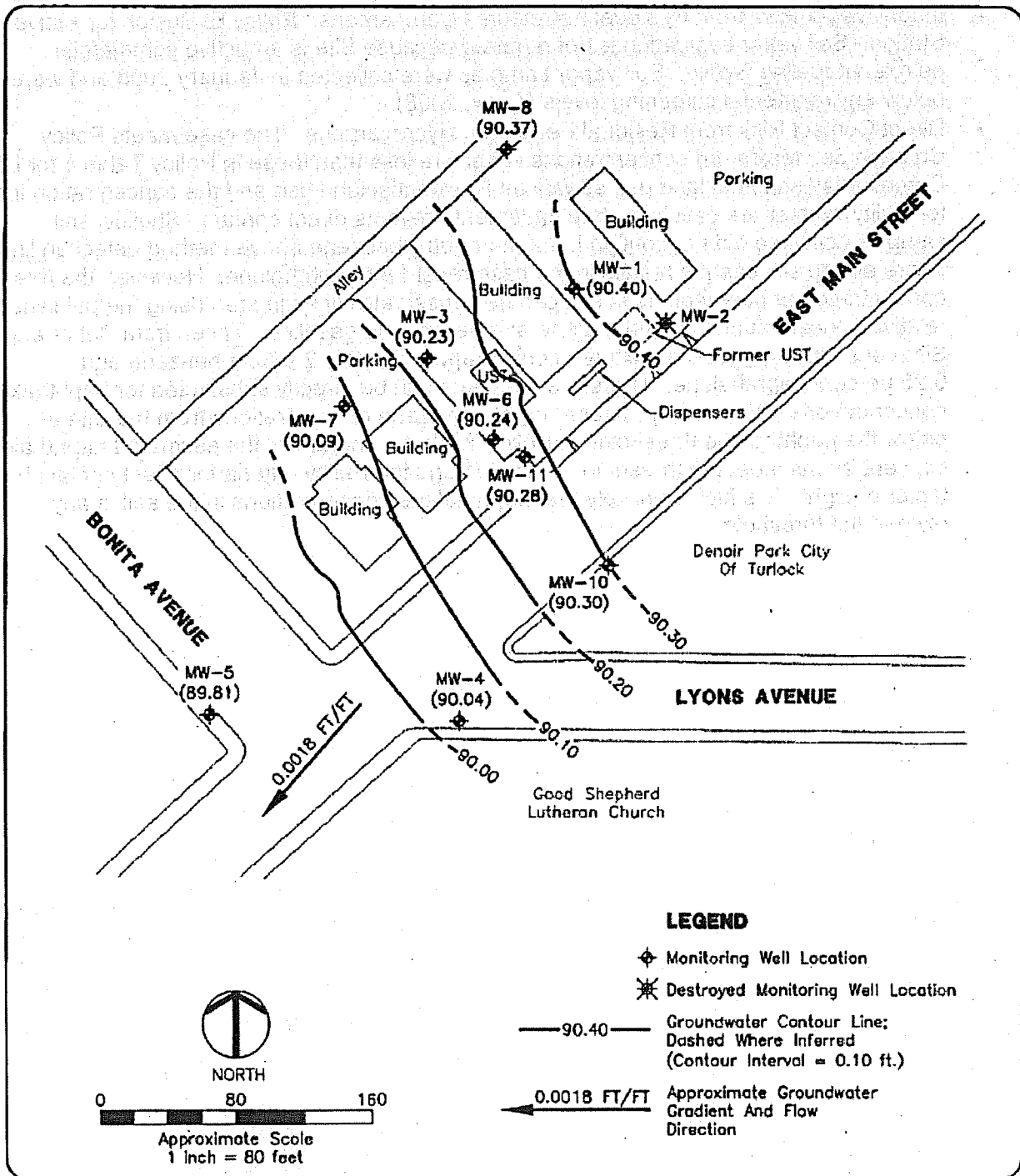
Far Downgradient Well



Evaluation of Current Risk

- Estimate of Hydrocarbon Mass in Soil: Approximately 475 pounds of TPHg was dissolved in groundwater in 2010 (Apex, March 2010).
- Soil/Groundwater tested for methyl tert-butyl ether (MTBE): Yes, see table above.
- Oxygen Concentrations in Soil Vapor: Average 5.7 percent in June 2012.
- Plume Length: <100 feet long.
- Plume Stable or Degrading: Yes.
- Contaminated Zone(s) Used for Drinking Water: No.
- Groundwater Risk from Residual Petroleum Hydrocarbons: The case meets Policy Groundwater-Specific Criterion 1 by Class 1. The contaminant plume that exceeds WQO is less than 100 feet in length. No free product is present. The nearest water supply well or surface water body is greater than 250 feet from the defined plume boundary.

- Indoor Vapor Risk from Residual Petroleum Hydrocarbons: Policy Exclusion for Active Station - Soil vapor evaluation is not required because Site is an active commercial petroleum fueling facility. Soil vapor samples were collected in January 2008 and were below environmental screening levels (Apex, 2008).
- Direct Contact Risk from Residual Petroleum Hydrocarbons: The case meets Policy Criterion 3a. Maximum concentrations in soil are less than those in Policy Table 1 for both Commercial/Industrial land use as well as Residential land use and the concentration limits for Utility Worker are satisfied. Site pavement prevents direct contact. Shallow soil samples collected did not contain benzene or ethylbenzene above method detection limits. There are no soil sample 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 percent benzene and 0.25 percent naphthalene. Therefore, benzene can be directly substituted for naphthalene concentrations with a safety factor of eight. Benzene concentrations from the Site are below the naphthalene thresholds in Policy Table 1. Therefore, the 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.



	DRAWN BY: N. Rouillard	GROUNDWATER CONTOUR MAP: DECEMBER 2, 2011	FIGURE 3
	DATE: 1/10/12		
	REVISIONS	Stop & Save #4 825 East Main Street Turlock, California	PROJECT NUMBER: CW58.002

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

The case complies with the 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 case 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 site 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 case?</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? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Does the unauthorized release consist only of petroleum? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Has the unauthorized (“primary”) release from the UST system been stopped? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Has free product been removed to the maximum extent practicable? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</p> <p>Has a conceptual site model that assesses the nature, extent, and mobility <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.
http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0016atta.pdf

<p>of the release been developed?</p> <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>Nuisance as defined by Water Code section 13050 does not 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 checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
<p>Media-Specific Criteria 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?</p> <p>If YES, check applicable class: <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input 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?</p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</p>

<p>If YES, check applicable scenarios: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input 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>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><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>