

State Water Resources Control Board

UST CASE CLOSURE SUMMARY

Agency Information

Agency Name: County of Sonoma	Address: 475 Aviation Blvd., Suite 220 Santa Rosa, CA 95403
Agency Caseworker: Ms. Becky Vermeer	Case No.: 00002445

Case Information

USTCF Claim No.: 336	Global ID: T0609700947
Site Name: BP Gas Station	Site Address: 18017 Sonoma Highway, Sonoma, CA 95476 (Site)
Petitioner: Mr. Jeffrey Freiberg Care of: INCORE Corp.	Address: P.O. Box 254, Sonoma, CA 95476
USTCF Expenditures to Date: \$571,875	Number of Years Case Open: 23

URL: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0609700947

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 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 follow:

The release at 18017 Sonoma Highway, Sonoma, CA, was discovered when four underground storage tanks (UST) were removed in 1989 and 1999 and replaced with two USTs that were removed in 2003. No known USTs remain at the Site. During the 2003 UST removal, approximately 1,818 tons of soil was excavated, over-excavated, and disposed. An additional approximately 348 tons of soil was removed in 2005. In 2001, air sparge/soil vapor extraction was determined not to be a feasible method for remediation. A pump and treat system operated from 2005 to 2008; approximately 867,000 gallons of impacted water was treated. The system was shut down because of diminishing influent concentrations.

The petroleum release is limited to the shallow soil and groundwater. The nearest public supply well regulated by the California Department of Public Health is located approximately 975 feet southwest (generally downgradient) of the Site. A domestic well is located approximately 500 feet southwest (apparently used for filling swimming facilities.) Water is provided to water users near the Site by the Valley of the Moon Water District. The affected groundwater 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 Criteria – Site meets the criterion in **CLASS a. SCENARIO 3.** Site-specific conditions satisfy Scenario 3 as applicable.
- Direct Contact and Outdoor Air Exposure Criteria – Site meets the criterion in **CLASS a.** Maximum concentrations of petroleum constants in soil are less than or equal to those listed in Table 1. The estimated naphthalene concentrations in soil are less than the thresholds in Table 1 of the Policy for direct contact. It is unlikely that naphthalene concentrations in soil, if any, exceed the threshold.

Objections to Closure

Sonoma County staff objected to UST case closure because:

1. Additional work is needed to fully characterize the Site.

Response: The Site has been sufficiently assessed/monitored and additional assessment/monitoring won't likely change the conceptual model. Remedial actions have been implemented and further remediation would be ineffective and expensive. Remaining petroleum constituents are limited, stable and declining. To the extent limited areas of groundwater may exceed water quality objectives for certain petroleum constituents, the impact will not unreasonably impair beneficial uses even if the period of impairment is decades to hundreds of years. Shallow affected groundwater is not currently being used as a source of drinking water or for any other designated beneficial use and it is highly unlikely, in part due to standard supply well construction practices, that the affected groundwater will be used as a source of drinking water or for any other beneficial use in the foreseeable future.

2. Residual soil and groundwater contamination persist at the Site.

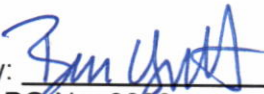
Response: Site conditions demonstrate that the residual petroleum constituents in soil and groundwater are protective of human health. (See Attachments 1 and Attachment 2 for further discussion.)

3. Risk of vapor intrusion needs to be determined for the adjacent apartment building located to the north and for workers at the onsite auto repair facility.

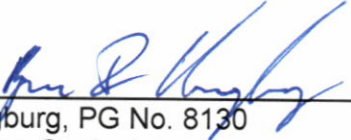
Response: Site-specific conditions satisfy the Policy criteria for vapor intrusion to indoor air. Total petroleum hydrocarbons (TPH) as gasoline, benzene, ethylbenzene, xylenes, and methyl tert-butyl ether (MTBE) currently exist in groundwater at the Site above WQOs. However, based on an analysis of Site-specific conditions that under current and reasonably anticipated near-term future scenarios, the residual contaminant plume beneath the onsite auto repair facility and northern property boundary poses a low-threat to human health, safety and the environment and WQOs will be achieved within a reasonable time frame.

Recommendation for Closure

Based on available information, 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: 
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4/10/2013
Date

Reviewed By: 
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Senior Engineering Geologist

4/10/2013
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? There was an order issued for this site. The corrective action performed in the past is consistent with that order. Since this case meets applicable case-closure requirements, further corrective action under the order that is not necessary, unless the activity is necessary for case closure.</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</p>
<p>General Criteria 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><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>

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

<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>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 type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA</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</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?</p> <p>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><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</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>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 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>
<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 at the intersection of Boyes Boulevard and Sonoma Highway in Sonoma. The Site is an operating Auto repair facility.
- The Site is bounded by an apartment complex to the northwest and commercial properties in all other directions.
- Nature of Contaminants of Concern: Petroleum hydrocarbons only.
- Primary Source of Release: UST system
- Discovery Date: 1989
- Release Type: Petroleum²
- Twelve monitoring wells and five remediation wells have been installed.
- Free Product: None reported

Table A: USTs

Tank No.	Size	Contents	Status	Date
1	4,000-gallon	Gasoline	Removed	1989
2	4,000-gallon	Gasoline	Removed	1989
3	4,000-gallon	Gasoline	Removed	1989
4	250-gallon	Waste Oil	Removed	1999
5	6,000-gallon	Gasoline	Removed	2003
6	6,000-gallon	Gasoline	Removed	2003

Receptors

- Groundwater Basin: Sonoma Valley
- Groundwater Beneficial Uses: Municipal and domestic water supply (MUN), industrial service water supply (IND), industrial process water supply (PRO), and agricultural water supply (AGR)
- Designated Land Use: General Commercial (GC)
- Public Water System: Valley of the Moon Water District
- Distance to Nearest Supply Wells: Domestic well ~500 feet southwest (apparently used for filling swimming facilities); Public supply well ~975 feet southwest
- Distance to Nearest Surface Waters: Sonoma Creek ~ 1,600 feet west

Geology/ Hydrogeology

- Average Groundwater Depth: ~15.5 feet (unconfined)
- Minimum Groundwater Depth: ~7.5 feet (unconfined)
- Groundwater Flow Direction: Westerly (unconfined)
- Geology: Weathered, clayey, ash-flow tuffs and lithic tuff to ~28 to ~30 feet bgs. From ~30 to ~36 feet bgs, tuff and gravelly tuff units that contain basalt fragments

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 & Safety Code, § 25299.2)

- Hydrology: Confined to semi-confined at ~30 to ~35 feet bgs. Monitoring wells at the Site may be the mechanism for creating a zone of unconfined groundwater above the confined to semi-confined zone.

Corrective Actions

- Four USTs were removed in 1989 and 1999 and replaced with two USTs that were removed in 2003. No known USTs remain at the Site.
- During the 2003 UST removal, approximately 1,818 tons of soil was excavated, over-excavated, and disposed. An additional approximately 348 tons of soil was removed in 2005.
- In 2001, air sparge/soil vapor extraction was determined not to be a feasible method for remediation.
- A pump and treat system operated from 2005 to 2008; approximately 867,000 gallons of impacted water was treated. The system was shut down because of diminishing influent concentrations.

Table B: Concentrations of Petroleum Constituents in Soil

Constituent	Maximum 0-5 ft. bgs (mg/kg)	Maximum 5-10 ft. bgs (mg/kg)
Benzene	<0.005	0.17
Ethylbenzene	<0.005	5.8
Naphthalene	Not Analyzed	Not Analyzed
Polyaromatic Hydrocarbons (PAHs)	Not Analyzed	Not Analyzed

mg/kg – milligram per kilogram

Table C: Concentrations of Petroleum Constituents of Concern in Groundwater

Sample	Sample Date	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Xylenes (ppb)	MTBE (ppb)	TBA (ppb)
P1	4/16/08	6,900	6.3	46	200	850	<120	19
P2	4/16/08	<50	<0.5	<0.5	<0.5	0.68	<5	<2.5
P3	4/16/08	<50	<0.5	<0.5	<0.5	<0.5	<5	<2.5
P4	6/27/11	2,600	3.7	1.9	69	47	42	25
P5	4/16/08	1,000	44	21	640	950	280	39
MW-1	6/27/11	<50	<0.5	<0.5	<0.5	<0.5	120	<10
MW-4	6/27/11	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0
MW-5	4/15/08	<50	<0.5	<0.5	<0.5	<0.5	7.5	11
MW-6	6/27/11	<50	<0.5	<0.5	<0.5	<0.5	8.3	<2.0
MW-7	6/27/11	350	<0.5	5.2	<0.5	<0.5	16	4.9
MW-8	4/16/09	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5
MW-9	4/16/09	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5
MW-10	4/16/09	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5
MW-11	4/16/09	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5
WQO	-	50	1	42	29	17	5	12*

* - California Notification Level
WQO - water quality objective
ppb - parts per billion

TPHg - total petroleum hydrocarbons as gasoline
MTBE - methyl tert-butyl ether
TBA - tert-butyl alcohol

Evaluation of Risk Criteria

- Maximum Petroleum Constituent Plume Length above WQOs: MTBE plume is ~225 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 – Site-specific conditions satisfy the Policy criteria for vapor intrusion to indoor air. 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
- Residual Petroleum Constituents in Soil Pose Significant Risk of Adversely Affecting Human Health: No – A Site-specific risk assessment from exposure shows that maximum concentrations of petroleum constituents in soil will have no significant risk of adversely affecting human health.
- Residual Petroleum Constituents Pose Significant Direct Contact and Outdoor Air Exposure to Human Health: No – Maximum concentrations of petroleum constituents in soil are less than or equal to those listed in Table 1 of the Policy. 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 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.

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

