CALIFORNIA
Water Boards

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SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board

UST CASE CLOSURE SUMMARY

Agency Information

Agency Name: County of Orange Health Care Agency Public Health Services Environmental Health (County)	Address: 1241 E. Dyer Rd. #120, Santa Ana, CA 92705
Agency Caseworker: Mr. Denamarie Baker	Case No.: 98UT012

Case Information

USTCF Claim No.: 16036	Global ID: T0605901353
Site Name: Shell Service Station	Site Address: 4035 Chapman Avenue, Orange, CA 92869 (Site)
Petitioner: Shell Oil Products US Attention: Mr. Marvin Katz	Address: 20945 South Wilmington Avenue, Carson, CA 90810
USTCF Expenditures to Date: $0	Number of Years Case Open: 22

URL: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0605901353

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 of petroleum constituents were discovered during a soil investigation in July 1991. The Site is an active Shell service station. Data from multiple soil borings and groundwater wells have been used to estimate the extent of contamination.

Results from soil vapor extraction (SVE) system operations indicate that most of the release was absorbed into silt layers at least 25 feet above the water table. Approximately 1,648 pounds of total petroleum hydrocarbons (TPH) were removed during SVE activities. Influent soil vapor extraction concentrations indicate remediation has been completed to the extent practicable.

Soil boring data indicate that petroleum constituents in soil are limited in lateral extent to the area located southwest of the former UST cavity and east of the southernmost pump island. The soil data sampled from boring B16, near the water table, and groundwater data from monitoring well MW-2 both indicate that the petroleum constituent plume above water quality objectives (WQOs) is limited in extent. The June 2011, groundwater sample from VW-5D indicates that the groundwater contamination plume is stable.

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 2**. Based on an analysis of Site-specific conditions a conservative estimate of plume length that exceeds WQOs is less than 200 feet. There is no free product. The nearest existing water supply well or surface water body is greater than 1,000 feet from the estimated plume boundary. The dissolved concentration of benzene is less than 3,000 micrograms per liter (µg/l), and the dissolved concentration of MTBE is less than 1,000 µg/L.

- Petroleum Vapor Intrusion to Indoor Air – Site meets the **EXCEPTION.** Exposures to petroleum vapors associated with historical fuel system releases are comparatively insignificant relative to exposures from small surface spills and fugitive vapor releases that typically occur at active fueling facilities.

- 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 for commercial property. 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

Orange County staff objected to UST case closure because:

1. During March 2006, the groundwater sample from well VW-5D had detectable concentrations of total petroleum hydrocarbons as gasoline, benzene, toluene, ethylbenzene, total xylene and TBA (3,900 ug/l, 2.7 ug/l, 1.8 ug/l, 12 ug/l, 29 ug/l and 43 ug/l, respectively). Although these concentrations were relatively low, there has not been sufficient water in any of the wells to collect a second round of groundwater samples to confirm the concentrations or evaluate any trend.

   <u>RESPONSE:</u> Well VW-5D was sampled in June 2011. Results from the June 2011 sampling event indicate that the petroleum constituent plume is stable. The extent of the groundwater plume is estimated to be less than 200 feet. Additional assessment will not likely change conceptual model.

2. Active production wells in the vicinity of the site, combined with the site being in a groundwater recharge basin area and course grained soils provide hydraulic communication between the shallow groundwater and deeper zones used for production.

   RESPONSE: The nearest supply well is over 2,000 feet southwest of the Site. Residual petroleum constituents in soil and groundwater are stable. It is unlikely that the plume exceeds 200 feet in lateral extent.

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: Russell Hansen
Russell Hansen, PE No. 77684
Water Resource Control Engineer

7/23/2013
Date

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

7/23/2013
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]

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.	☒ Yes ☐ No
Have waste discharge requirements or any other orders issued pursuant to Division 7 of the Water Code been issued at this Site?	☐ Yes ☒ No
If so, was the corrective action performed consistent with any order?	☐ Yes ☐ No ☒ NA
<u>**General Criteria**</u> General criteria that must be satisfied by all candidate sites: **Is the unauthorized release located within the service area of a public water system?** **Does the unauthorized release consist only of petroleum?** **Has the unauthorized ("primary") release from the UST system been stopped?** **Has free product been removed to the maximum extent practicable?** **Has a conceptual site model that assesses the nature, extent, and mobility of the release been developed?**	 ☒ Yes ☐ No ☒ Yes ☐ No ☒ Yes ☐ No ☒ Yes ☐ No ☐ NA ☒ Yes ☐ No

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

Has secondary source been removed to the extent practicable?	☒ Yes ☐ No
Has soil or groundwater been tested for MTBE and results reported in accordance with Health and Safety Code, Section 25296.15?	☒ Yes ☐ No
Does nuisance as defined by Water Code, section 13050 exist at the Site?	☐ Yes ☒ No
Are there unique Site attributes or Site-specific conditions that demonstrably increase the risk associated with residual petroleum constituents?	☐ Yes ☒ No
<u>Media-Specific Criteria</u> Candidate sites must satisfy all three of these media-specific criteria: **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:	
Is the contaminant plume that exceeds water quality objectives stable or decreasing in areal extent?	☒ Yes ☐ No ☐ NA
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: ☐ **1** ☒ **2** ☐ **3** ☐ **4** ☐ **5**	☒ Yes ☐ No ☐ NA
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?	☐ Yes ☐ No ☒ NA
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.	
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.	☒ Yes ☐ No
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: ☐ **1** ☐ **2** ☐ **3** ☐ **4**	☐Yes ☐ No ☒ NA
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?	☐ Yes ☐ No ☒ NA

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?	☐ Yes ☐ No ☒ NA
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).	
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)?	☒ Yes ☐ No ☐ NA
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?	☐ Yes ☐ No ☒ NA
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?	☐ Yes ☐ No ☒ NA

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

Site Location/ History

- The Site is located at the intersection of Chapman Avenue and Esplanade Street in Orange, CA.
- The Site is an operating petroleum fueling facility.
- The Site is bounded by commercial and residential properties
- Nature of Contaminants of Concern: Petroleum hydrocarbons only.
- Primary Source of Release: UST system
- Discovery Date: July 1991
- Release Type: Petroleum[2]
- Free Product: None reported

Table A. USTs:

Tank No.	Size	Contents	Status	Date
1	10,000 gallon	Petroleum	Replaced	2003
2	10,000 gallon	Petroleum	Removed	2003
3	10,000 gallon	Petroleum	Removed	2003
4	10,000 gallon	Petroleum	Removed	2003

Receptors

- Groundwater Basin: Coastal Plain of Orange County (8-1)
- Groundwater Beneficial Uses: Groundwater recharge (GWR); Municipal and domestic supply (MUN); agricultural supply (AGR); industrial service supply (IND); and industrial process supply (PRO).
- Designated Land Use: Commercial and Residential
- Public Water System: City of Orange, Public Works Water Division
- Distance to Nearest Surface Waters: Approximately 2,200 feet (west).
- Distance to Nearest Supply Wells: El Modena Park has a pond which is located approximately 2,000 feet southeast. Santiago Creek is located approximately 2,500 feet northwest.

Geology/ Hydrogeology

- Average Groundwater Depth: Depth to water varies from 120 feet to over 140 feet below grade surface (bgs).
- Minimum Groundwater Depth: Approximately 132 feet bgs, (2011)
- Groundwater Flow Direction: Southwest
- Geology: Primarily sandy gravel and fine to course grained silty sand. Clay, and silty clay layers exists on-Site at distinct depth intervals.
- Hydrogeology: Groundwater is unconfined.

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[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

- September 1995: SVE pilot test
- April 2002: 2nd SVE pilot test
- April 2003: USTs and Conveyance system replaced.
- July 2005 through October 2005: SVE system was operated using vapor extraction wells VW-4S, VW-4M, VW-5S, VW-5M, and VW-5D for remediation. Approximately 1,648 pounds of total petroleum hydrocarbons were removed during the 58 day extraction event. The SVE system was shut down after low influent concentrations were detected.

Table B. Concentrations of Petroleum Constituents in Soil

Constituent	Maximum 0-5 feet bgs (mg/kg)	Maximum 5-10 feet bgs (mg/kg)
Benzene	<1.0	3.8
Ethylbenzene	<1.0	24.1
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

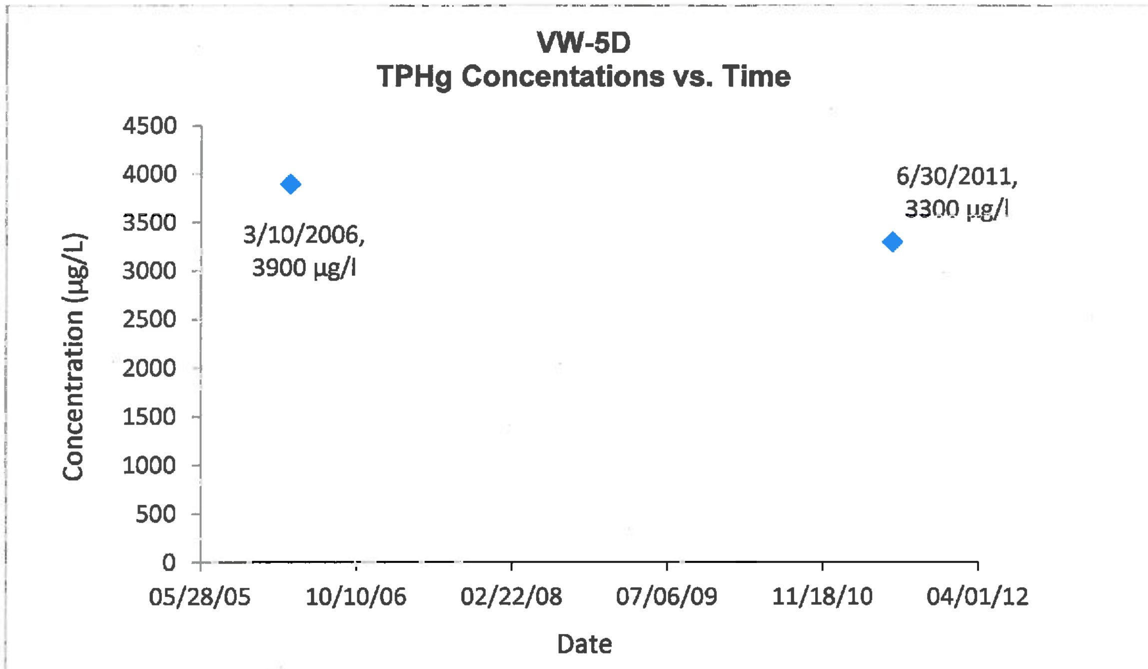
Well ID	Sample Date	DTW	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
		(ft)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
MW-1	10/3/11	131.55	<50	<0.5	<0.5	<0.5	<1.0	<1.0
MW-2	6/14/12	132.65	<50	<0.5	<0.5	<0.5	<1.0	<1.0
MW-4	6/14/12	131.85	<50	<0.5	<0.5	<0.5	<1.0	<1.0
VW-5D	6/30/11	119.25	**3300**	**53**	**48**	**310**	**290**	**5**
WQOs			**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

Groundwater Concentrations

Petroleum constituents in groundwater near well VW-5D have shown stable concentrations. Data from adjácent well MW-2 support the conceptual model that groundwater impact is minimal in extent.

Figure 1. TPHg Concentrations in Well VW-5D



Evaluation of Risk Criteria

- Maximum Petroleum Constituent Plume Length above WQOs: Plume length is estimated to be less than 200 feet. Results from soil boring investigation and vapor extraction support the plume is limited in lateral extent.
- 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 Nuisance[3] at the Site: No
- Residual Petroleum Constituents in Soil Pose Significant Risk of Adversely Affecting Human Health: No.
- 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

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

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.

Figure 2. Site Map