UST CASE CLOSURE SUMMARY

Agency Information

Current Agency Name: State Water Resources Control Board (State Water Board)	Address: 1001 I Street, P.O. Box 2231 Sacramento, CA 95812
Current Agency Caseworker: Mr. Matthew Cohen	Case No.: N/A

Former Agency Name: City of Berkeley (Prior to 7/1/2013)	Address: 2118 Milvia Street, Suite 300 Berkeley, CA 94704
Former Agency Caseworker: Mr. Geoff Fiedler	Case No.: 01-1444

Case Information

USTCF Claim Nos.: 14930,15984,1637	Global ID: T060101333
Site Name: Super 7 (76 Service Station No. 7331)	Site Address: 901 Ashby Avenue Berkeley, CA 94704 (Site)
Petitioner: ConocoPhillips Company Attention: Ms. Shelby Lathrop	Address: 76 Broadway Street Sacramento, CA 95818
USTCF Expenditures to Date: $1,045,930	Number of Years Case Open: 27

URL: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T060101333

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 (CSM) upon which the evaluation of the Case has been made is described in **Attachment 2: Summary of Basic Site Information.** Highlights of the CSM of the Case are as follows:

The release at the Site was discovered when the underground storage tanks (UST) product delivery system failed a precision test in 1986. Free product from the on-Site release existed in monitoring wells from 1986 to 1994. Between 1986 and 2005, soil and groundwater remediation activities included: operation of groundwater extraction (GWE) and excavation of soil, air sparging (AS); and dual-phase extraction (DPE) systems. During 2006, AS and DPE systems were terminated due to low influent concentrations and operational issues. A sensitive receptor survey identified one water supply well located within 2,000 feet of the Site. The water supply well is located 1,360 feet southwest (crossgradient) from the Site. The petroleum constituent plume has been stable or decreasing since 2008.

The petroleum release is limited to the shallow soil and groundwater. 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 is not necessary. 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 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 of the Policy. Naphthalene was not tested. The estimated naphthalene concentrations in soil meet the thresholds in Table 1 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

City of Berkeley staff objected to UST case closure because:

1. The City of Berkeley staff believes the case may be suitable for closure when the CSM is amended to reflect appropriate beneficial use designation, groundwater flow and quality, and demonstrated mitigation of vapor intrusion to indoor air.

   RESPONSES: Amending the CSM to include a description of designated beneficial uses for affected and unaffected groundwater beneath the Site would result in a more accurate CSM, however supporting data and analysis used to develop the CSM are not required to be contained in a single report and may be contained in multiple reports submitted to the regulatory agency over a period of time.

   Information pertaining to groundwater flow and quality has been reported for over 25 years. Groundwater flow direction beneath the Site is west-northwest and the quality of groundwater affected by the on-Site release has greatly improved as a result of active remediation.

Mitigation of petroleum vapors related to the on-Site release is unnecessary. The Site meets the Policy exception for active fueling facilities. Additionally, soil and groundwater conditions beneath the commercial building located west of the Site meets CRITERIA (2) a, Scenario 3 in the Policy.

2. Ground water flow representations are somewhat subjective. Fuel impacts in monitoring well MW-5 may have increased due to migration toward extraction wells. Confirmation sampling from the extraction wells would provide appropriate information regarding rebound or residual product as may be present after discontinuing treatment at these locations.

   RESPONSE: Samples from secondary source area wells MW-1 and MW-2 contained the highest concentrations of petroleum constituents (primarily total petroleum hydrocarbons (TPH) as gasoline and methyl tertiary butyl ether (MTBE)) during 1998 and 1999. Concentrations of TPH as gasoline and MTBE have been near or below WQOs in both of these wells since 2009. Since the secondary source area has been remediated and the plume is stable or decreasing, it is highly unlikely that petroleum constituents in well MW-5 would increase.

3. Vapor intrusion, suspected from groundwater migration from the Site, has been identified in off-Site buildings west of the Site. There has been no evaluation that remedial measures have corrected the vapor migration concern.

   RESPONSE: Soil and groundwater conditions beneath the commercial building located west of the Site meets the Media-Specific Criteria for Petroleum Vapor Intrusion to Indoor Air CRITERIA (2) a, Scenario 3, in the Policy.

4. In the event the State Water Resources Control Board approves the closure petition, Toxics Management Division requests providing clear language or instruction regarding future restrictions for anticipated uses.

   RESPONSE: A Site-specific analysis is used to form the basis of a CSM for a case that meets criteria of the Policy. This analysis includes assessments of potential future risks associated with residential and commercial uses of the property. If the use of the property changes, the Site may be re-evaluated using criteria contained in the Policy.

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: Sheena Dhillon — 8/28/13
Sheena Dhillon — Date
Engineering Student Assistant

Reviewed By: Benjamin R. Heningburg — 8/28/13
Benjamin Heningburg, PG No. 8130 — Date
Senior Engineering Geologist

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?	☒ Yes ☐ No
Does the unauthorized release consist only of petroleum?	☒ Yes ☐ No
Has the unauthorized ("primary") release from the UST system been stopped?	☒ Yes ☐ No
Has free product been removed to the maximum extent practicable?	☒ Yes ☐ No ☐ NA
Has a conceptual site model that assesses the nature, extent, and mobility of the release been developed?	☒ 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 Ashby Avenue, 7th Street and Potter Street in Berkeley.
- The Site is an operating petroleum fueling facility.
- The Site is bounded by commercial properties. A closed UST site is located to the southwest.
- Nature of Contaminants of Concern: Petroleum hydrocarbons only.
- Primary Source of Release: UST system
- Discovery Date: 1986
- Release Type: Petroleum[2]
- Free Product: Last observation was in well MW-6 during August 1998

Table A. USTs:

Tank No.	Size	Contents	Status	Date
1	12,000-gallon	Gasoline	Installed	1983
2	12,000-gallon	Gasoline	Installed	1983
3	12,000-gallon	Gasoline	Installed	1983
4	12,000-gallon	Diesel	Installed	1983
5	550-gallon	Remediation groundwater	Removed	1999

Receptors

- Groundwater Basin: Santa Clara Valley Basin, East Bay Plain (2-9.04)
- Groundwater Beneficial Uses: Municipal and domestic water supply (MUN), agricultural supply (AGR), industrial service supply (IND), and industrial process supply (PRO).
- Designated Land Use: General commercial (GC)
- Public Water System: East Bay Municipal Utility District
- Distance to Nearest Surface Waters: Berkeley Aquatic Park is located greater than 1,000 feet west
- Distance to Nearest Supply Wells: Well is located greater than 1,000 feet southwest (cross gradient)

Geology/ Hydrogeology

- Average Groundwater Depth: approximately 14 feet below grade surface (bgs)
- Minimum Groundwater Depth: approximately 13 feet bgs
- Groundwater Flow Direction: west-northwest
- Geology: Asphalt and concrete cap. Upper seven feet composed of coarse grained sands and gravels underlain by clayey with sand to approximately 12 feet bgs. Silty clay exists between approximately 12 feet and 16 feet bgs. Gravelly and poorly graded sands exists between approximately 16 feet and 27 feet bgs. Silty clay exists between approximately 27 feet and 32 feet bgs (total depth explored).
- 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

- November 1986 – Water table depression pump (GW extraction), a separate phase product recovery pump, and an air stripper were installed prior to groundwater discharge to storm drain.
- December 1994 – Remediation system expanded to include a vapor extraction system including a catalytic oxidizer and activated carbon. Approximately 591 gallons of gasoline removed between November 1994 and December 1995.
- November 1998 – 59 tons of soil removed from product line trenches.
- January 1999 – 5,000 gallons of impacted groundwater were extracted from dual-phase extraction test.
- January 1999 – AS and DPE test removed approximately 110 pounds of petroleum hydrocarbons.
- October 2000 – AS/DPE system started. System was shut down in 2006.

Table B. Concentrations of Petroleum Constituents in Soil

Constituent	Maximum 0-5 feet bgs (mg/kg)	Maximum 5-10 feet bgs (mg/kg)
Benzene	<0.0052	0.021
Ethylbenzene	<0.0038	0.11
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	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	TBA
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
MW-1	9/6/11	<50	<0.5	<0.5	<0.5	<1.5	<0.5	<5.0
MW-2	3/7/11	<50	<0.5	<0.5	<0.5	<1.5	1.5	<5.0
MW-3	3/7/11	<50	<0.5	<0.5	<0.5	<1.5	0.57	<5.0
MW-4	9/6/11	**2060**	<0.5	<0.5	1.1	<1.5	**13.1**	5.7
MW-5	9/6/11	**755**	<0.5	<0.5	<0.5	<1.5	**1730**	**109**
MW-7	3/7/11	<50	<0.5	<0.5	<0.5	<1.5	<0.5	<5.0
MW-8	3/2/09	<50	<0.5	<0.5	<0.5	<1.0	<0.50	<10
MW-9	3/2/09	<50	<0.5	<0.5	<0.5	<1.0	<0.50	<10
W-11	3/7/11	<50	<0.5	<0.5	<0.5	<1.5	4.4	<5.0
W-12	9/6/11	<50	<0.5	<0.5	<0.5	<1.5	**24.7**	**98.9**
WQOs		**50**	**1**	**42**	**3.2**	**17**	**5**	**12**

Notes:
bold indicates that sample result exceeds WQOs
TPHg – Total petroleum hydrocarbons as gasoline
TPHd – Total petroleum hydrocarbons as diesel
MTBE- Methyl tert-butyl ether
TbTBA – Tertiary butyl alcohol
µg/L – micrograms per liter
"<" – indicates result is below the laboratory reporting limit
1 – Sampled 12/18/1998

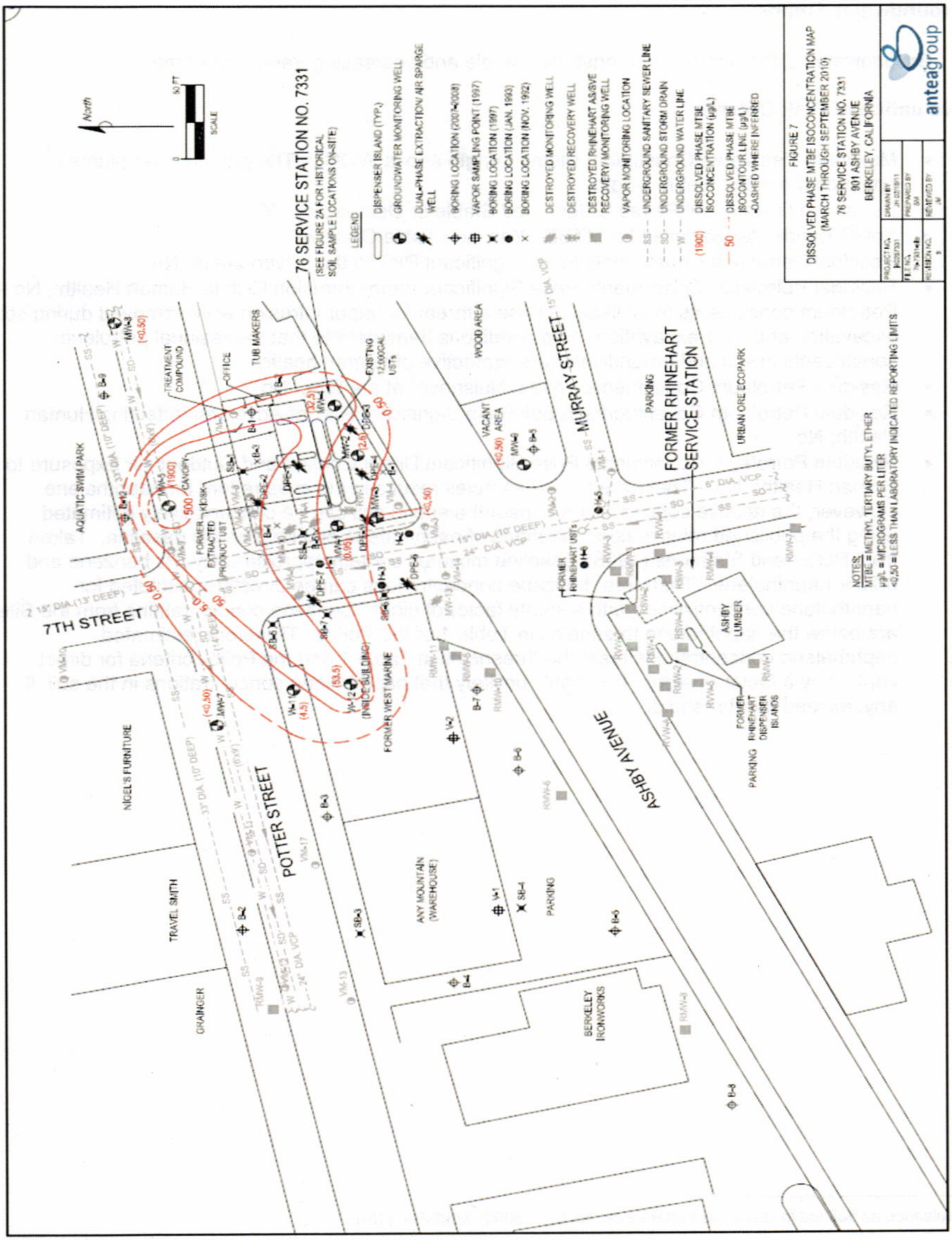
Groundwater Trends

- Groundwater at the Site has demonstrated stable and decreasing trends over time.

Evaluation of Risk Criteria

- Maximum Petroleum Constituent Plume Length above WQOs: The groundwater plume is approximately 200 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 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 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.

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


North
SCALE
76 SERVICE STATION NO. 7331
(SEE FIGURE 2A FOR HISTORICAL SOIL SAMPLE LOCATIONS ON-SITE)
LEGEND
DISPENSER ISLAND (TYP.)
GROUNDWATER MONITORING WELL
DUAL-PHASE EXTRACTION/ AIR SPARGE WELL
BORING LOCATION (2007-2008)
VAPOR SAMPLING POINT (1997)
BORING LOCATION (1997)
BORING LOCATION (JAN. 1993)
BORING LOCATION (NOV. 1992)
DESTROYED MONITORING WELL
DESTROYED RECOVERY WELL
DESTROYED RHINEHART AS/SVE RECOVERY/ MONITORING WELL
VAPOR MONITORING LOCATION
UNDERGROUND SANITARY SEWER LINE
UNDERGROUND STORM DRAIN
UNDERGROUND WATER LINE
DISSOLVED PHASE MTBE ISOCONCENTRATION (µg/L)
DISSOLVED PHASE MTBE ISOCONTOUR LINE (µg/L) -DASHED WHERE INFERRED
NOTES:
MTBE = METHYL TERTIARY BUTYL ETHER
µg/L = MICROGRAMS PER LITER
<0.50 = LESS THAN LABORATORY INDICATED REPORTING LIMITS
FIGURE 7
DISSOLVED PHASE MTBE ISOCONCENTRATION MAP
(MARCH THROUGH SEPTEMBER 2010)
76 SERVICE STATION NO. 7331
901 ASHBY AVENUE
BERKELEY, CALIFORNIA
anteagroup
7TH STREET
POTTER STREET
MURRAY STREET
ASHBY AVENUE
FORMER RHINEHART SERVICE STATION
AQUATIC SWIM PARK
TREATMENT COMPOUND
OFFICE
TUB MAKERS
EXISTING 12,000GAL USTs
CANOPY
KIOSK
FORMER EXTRACTED PRODUCT UST
VACANT AREA
WOOD AREA
PARKING
URBAN ORE ECOPARK
ASHBY LUMBER
FORMER RHINEHART USTs
FORMER RHINEHART DISPENSER ISLANDS
FORMER WEST MARINE
(INSIDE BUILDING)
NIGEL'S FURNITURE
TRAVEL SMITH
GRANGER
ANY MOUNTAIN (WAREHOUSE)
BERKELEY IRONWORKS
15" DIA.(10' DEEP)
24" DIA. VCP
6" DIA. VCP
33" DIA (10' DEEP)