

State Water Resources Control Board

REVIEW SUMMARY REPORT – CONCUR PRELIMINARY REVIEW – FEBRUARY 2014

Agency Information

Agency Name: San Mateo County Environmental Health (County)	Address: 2000 Alameda de las Pulgas San Mateo, CA 94403
Agency Caseworker: Marc Mullaney	Case No.: 880057

Case Information

USTCF Claim No.: 19162	GeoTracker Global ID: T0608182194
Site Name: Shell Service Station	Site Address: 1199 El Camino Real San Bruno, CA 94066
Responsible Party: Shell Oil Products Attn: Deborah Pryor	Address: 20945 S. Wilmington Avenue Carson, CA 90810
USTCF Expenditures to Date: \$0	Number of Years Case Open: 11

URL: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0608182194

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 does not meet 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:

This case is an active commercial petroleum fueling facility and currently has three 10,000-gallon gasoline USTs. An unauthorized release was reported in September 2002 following a monitoring well installation event at the Site. Product lines and dispensers were upgraded in 2004. Approximately 10 cubic yards of impacted soil were removed during the upgrade activities. Groundwater extraction was conducted between November 2005 and July 2010, removed approximately 4,511,421 gallons of groundwater and approximately 16 pounds of petroleum hydrocarbons as gasoline (TPHg). Since 2002, 19 groundwater monitoring wells have been installed and irregularly monitored. According to groundwater data, water quality objectives have been achieved or nearly achieved for all constituents except for benzene and methyl tert-butyl ether (MTBE).

The petroleum release is limited to the soil and shallow groundwater. According to data available in GeoTracker, there are no supply wells regulated by the California Department of Public Health or surface water bodies within 1,000 feet of the projected plume boundary. No other water supply wells have been identified within 1,000 feet of the projected plume boundary in files reviewed. Water is provided to water users near the Site by the City of San Bruno. 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.

Rationale for Closure under the Policy

- **General Criteria:** The case meets all eight Policy general criteria.
- **Groundwater Specific Criteria:** The case does not meet Policy Criteria. The MTBE plume that exceeds the water quality objective is greater than 250 feet in length. The maximum dissolved concentrations of benzene and MTBE are each greater than 1,000 µg/L.
- **Vapor Intrusion to Indoor Air:** The case meets the Policy Exclusion for Active Station. Soil vapor evaluation is not required because the Site is an active commercial petroleum fueling facility and the release characteristics do not pose an unacceptable health risk. Where the benzene plume exists off the Site, the case meets Policy Criterion 2a by Scenario 3b. The maximum benzene concentration in groundwater is less than 1,000 µg/L. The minimum depth to groundwater is greater than 10 feet, overlain by soil containing less than 100 mg/kg of TPH.
- **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 Commercial/Industrial use, and the concentration limits for a Utility Worker are not exceeded. 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 used as surrogate 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

The County objects to UST case closure (June 5, 2013 letter) because:

- The MTBE plume is not stable as defined by the recent increases in concentration in MW-16 and MW-18 along the plume center line.
RESPONSE: The Fund concurs with the County. Additional groundwater monitoring is necessary to determine plume stability. The Fund will reevaluate this case for closure in one year.

Update

In a letter dated February 18, 2014, the County provided the following comments to the original Review Summary Report (Report), and the Fund responses follow:

- The County believes that since the extent of the groundwater plume is undefined, the Policy checklist in the Report "should recognize that the San Mateo County Environmental Health, Groundwater Protection Program (GPP) believes a water well is located less than 1,000 feet from the plume boundary".
RESPONSE: The Policy checklist included in this Report (Attachment 1) does not include distance information or a comment section. Therefore, the GPP belief is noted here and in the Recommendation section in the Report.
- The County believes a mean benzene concentration greater than 3,000 µg/L should be used in the Report under the Groundwater Specific Criteria evaluation.
RESPONSE: The Conceptual Site Model (Attachment 2) in this Report is developed using the most recent groundwater concentrations of petroleum constituents in groundwater rather than

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?</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.

http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0016atta.pdf

<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 <input type="checkbox"/> NA</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 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 type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA</p> <p><input type="checkbox"/> Yes <input checked="" 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><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>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>

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

Site Location/History

- This case is located on the south corner of the intersection of El Camino Real and Sneath Lane, and is an active commercial petroleum fueling facility.
- The Site is bounded on the northwest by the Golden Gate National Cemetery across Sneath Lane, on the northeast by a large parking lot, on the southeast by a pet hospital, and on the southwest by a navy equipment yard.
- Site map showing the location of the USTs, monitoring wells, groundwater level contours, and petroleum constituents concentrations is provided at the end of this document (CRA, June 2013).
- Nature of Contaminants of Concern: Petroleum hydrocarbons only.
- Source: UST system.
- Date reported: September 2002.
- Status of Release: Product lines and dispensers upgraded in 2004.

Tank Information

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

Receptors

- GW Basin: Westside.
- Beneficial Uses: San Francisco Bay Regional Water Quality Control Board (Regional Water Board) Basin Plan lists municipal and domestic, industrial process, industrial service and agriculture supplies.
- Land Use Designation: Aerial photograph available on GeoTracker indicates commercial land use in the vicinity of the Site.
- Public Water System: City of San Bruno.
- Distance to Nearest Supply Well: According to data available in GeoTracker, there are no public supply wells regulated by the California Department of Public Health within 1,000 feet of the projected plume boundary. No other water supply wells were identified within 1,000 feet of the projected plume boundary in the files reviewed.
- Distance to Nearest Surface Water: There is no identified surface water within 1,000 feet of the projected plume boundary.

Geology/Hydrogeology

- Stratigraphy: The Site is underlain by interbedded and intermixed fine and coarse grained clays, silty clays, sandy and clayey silts, silty sands and sands.
- Maximum Sample Depth: 44.5 feet below ground surface (bgs).
- Minimum Groundwater Depth: 12.93 feet bgs at monitoring well MW-15.
- Maximum Groundwater Depth: 40.48 feet bgs at monitoring well MW-11.
- Current Average Depth to Groundwater: Approximately 28 feet bgs.
- Saturated Zones(s) Studied: Approximately 13 to 45 feet bgs.
- Appropriate Screen Interval: Yes.

- Groundwater Flow Direction: Northeast with an average gradient of between 0.006 and 0.02 feet/foot (June 2013).

Monitoring Well Information

Well Designation	Date Installed	Screen Interval (feet bgs)	Depth to Water (feet bgs) (12/31/2013)
MW-2	August 2002	25 – 40	31.32
MW-3	August 2002	25 – 40	34.36
MW-4	August 2002	30 – 45	31.23
MW-5	August 2003	25 – 45	30.54
MW-6	August 2003	25 – 40	32.50
MW-7	August 2003	25 – 40	Not measured
MW-8	August 2003	25 – 40	Not measured
MW-9	January 2004	25 – 40	27.41
MW-10	January 2004	25 – 40	26.96
MW-11	December 2004	25 – 45	31.46
MW-12	December 2004	25 – 45	29.58
MW-13	December 2004	25 – 45	29.80
MW-14	May 2005	25 – 40	22.98
MW-15	May 2005	30 – 40	21.98
MW-15A	May 2005	10 – 20	19.74
MW-16	May 2005	30 – 40	24.79
MW-17	January 2006	37.5 – 42.5	26.72
MW-18	January 2006	35 – 45	23.18

Remediation Summary

- Free Product: Free product was detected between 2007 and 2009. The groundwater extraction system was modified to remove the free product. No free product has been detected since June 2009.
- Soil Excavation: Approximately 10 cubic yards of impacted soil were removed during the dispenser and piping upgrade activities in October 2004.
- In-Situ Soil Remediation: None reported.
- Groundwater Remediation: Groundwater extraction was conducted between November 2005 and July 2010, removed approximately 4,511,421 gallons of groundwater and approximately 16 pounds of TPHg.

Most Recent Concentrations of Petroleum Constituents in Soil

Constituent	Maximum 0-5 feet bgs [mg/kg (date) sample-depth]	Maximum 5-10 feet bgs [mg/kg (date) sample-depth]
Benzene	0.04 (10/06/04) D-1-2'	<0.005
Ethylbenzene	0.011 (10/06/04) D-1-2'	<0.005
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-2	06/24/13	41,000	2,900	530	200	1,500	1,400*	<250*
MW-3	06/24/13	52	<0.5	<0.5	<0.5	<1	24	<10
MW-4	06/24/13	68	<0.5	<0.5	<0.5	<1	40	<10
MW-5	06/24/13	570	8.8	0.76	0.54	<1	12*	170*
MW-6	06/24/13	<50	<0.5	<0.5	<0.5	<1	1.3	<10
MW-7	06/14/10	52	<0.5	<1	<1	<1	<1	NA
MW-8	06/14/10	<50	<0.5	<1	<1	<1	<1	NA
MW-9	06/14/10	<50	<0.5	<1	<1	<1	2.5	NA
MW-10	06/24/13	110	<1	<1	<1	<2	140*	<20*
MW-11	06/24/13	67	<0.5	<0.5	<0.5	<1	1.2	<10
MW-12	06/24/13	3,000	170	43	9.8	55	170	260
MW-13	06/24/13	940	86	1.7	1.9	6.4	3.4	36
MW-14	06/14/10	51	<0.5	<1	<1	<1	<1	NA
MW-15	06/24/13	75	<0.5	<0.5	<0.5	<1	160*	<10*
MW-15A	06/14/10	64	<0.5	<1	<1	<1	<1	NA
MW-16	06/24/13	390	<2	<2	<2	<4	690*	<50*
MW-17	12/08/10	<50	<0.5	<1	<1	<1	<1	<10
MW-18	06/24/13	240	<0.5	<0.5	<0.5	<1	640*	<10*
WQOs		--	1	150	700	1,750	5^a	1,200^b

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, Regional Water Board Basin Plan

--: Regional Water Board Basin Plan does not have a numeric water quality objective for TPHg

^a: Secondary maximum contaminant level (MCL)

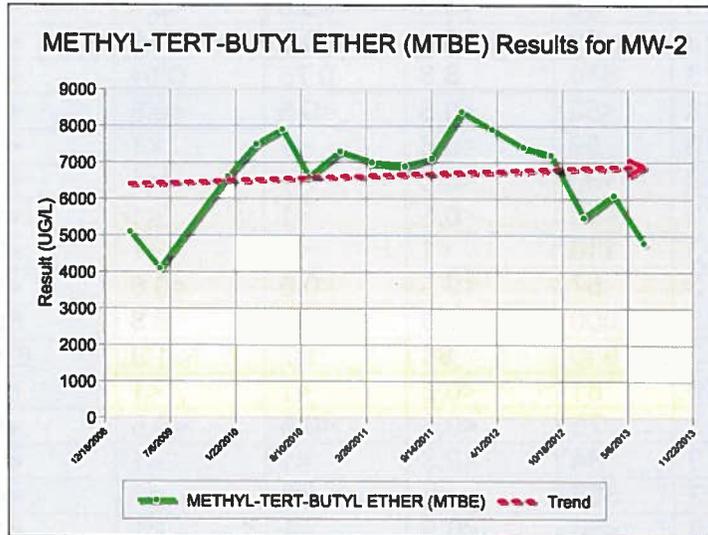
^b: California Department of Public Health, Response Level

*: Sampled on December 31, 2013.

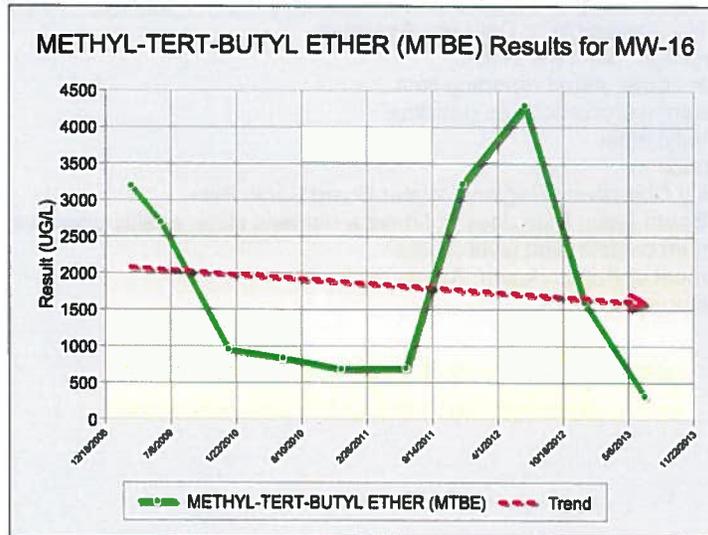
Groundwater Trends

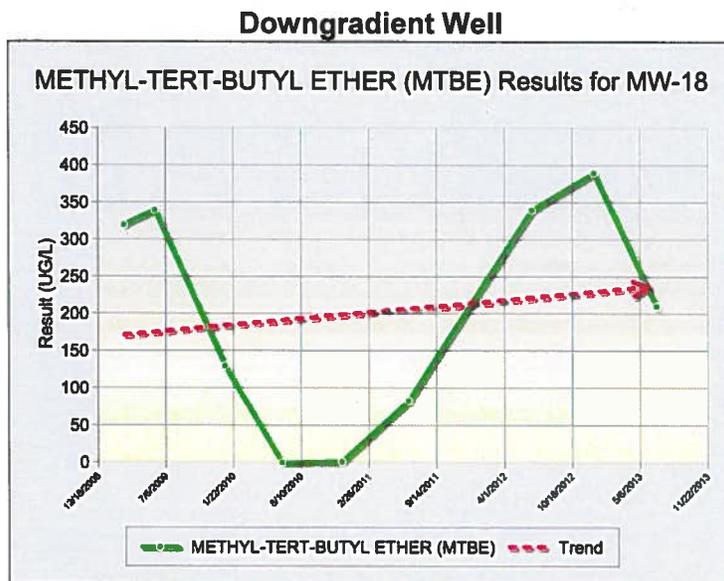
Since 2002, 19 groundwater monitoring wells have been installed and regularly monitored. One monitoring well (MW-1) has been abandoned. MTBE trends are shown below in the source area well MW-2, intermediate well MW-16 and the most downgradient well MW-18:

Source Area Well



Intermediate Well





Evaluation of Current Risk

- Estimate of Hydrocarbon Mass in Soil: None reported.
- Soil/Groundwater tested for methyl tert-butyl ether (MTBE): Yes.
- Oxygen Concentrations in Soil Vapor: None reported.
- Plume Length: <1,000 feet.
- Plume Stable or Decreasing: No.
- Contaminated Zone(s) Used for Drinking Water: No.
- Groundwater Risk from Residual Petroleum Hydrocarbons: The case does not meet Policy Criteria. The MTBE plume that exceeds the water quality objective is greater than 250 feet in length. The maximum dissolved concentrations of benzene and MTBE are each greater than 1,000 µg/L.
- Indoor Vapor Risk from Residual Petroleum Hydrocarbons: The case meets the Policy Exclusion for Active Station. Soil vapor evaluation is not required because the Site is an active commercial petroleum fueling facility and the release characteristics do not pose an unacceptable health risk. Where the benzene plume exists off the Site, the case meets Policy Criterion 2a by Scenario 3b. The maximum benzene concentration in groundwater is less than 1,000 µg/L. The minimum depth to groundwater is greater than 10 feet, overlain by soil containing less than 100 mg/kg of TPH.
- 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 Commercial/Industrial use, and the concentration limits for a Utility Worker are not exceeded. 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 used as surrogate 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.

