UST CASE CLOSURE SUMMARY

Agency Information

Agency Name: Alameda County Health Care Services Agency	Address: 1131 Harbor Bay Parkway, Suite 250, Alameda, CA 94502-6577
Agency Caseworker: Mr. Keith Nowell	Case No.: RO0000139

Case Information

USTCF Claim No.: 3406	Global ID: TO600100882
Site Name: Mehdizadeh Property	Site Address: 5175 Broadway Oakland, CA94611 (Site)
Responsible Parties: Mr. Gary Feiner Rockridge Heights, LLC. Mr. Mojdeh Mehdizadeh C/O Mohammed H. Mehidizadeh	Address: 6100 Pinewood Road Oakland, CA 94611 678 La Corso Drive Walnut Creek, CA 94598
USTCF Expenditures to Date: $734,225	Number of Years Case Open: 22

URL: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0600100882

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 Low-Threat 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 at the Site was discovered when the former underground storage tanks (UST) were removed from the Site in January 1990. During the 1990 UST removal, approximately 700 tons of impacted soil were excavated, remediated, and reused for backfill. Free product existed in two monitoring wells (MW) STMW-4 from October 2006 through January 2007, and MW-3C in June 2007. Remediation activities included operation of Dual Phase Extraction (DPE) and Air-Sparge (AS) systems between December 2010 and January 2012. The DPE and AS systems were terminated in January 2012 after removal rates for petroleum hydrocarbons reached asymptotic conditions. In November 2012 rebound test verified asymptotic conditions. Since termination of the DPE and AS systems, petroleum hydrocarbons in groundwater concentrations remain lower than pre-remediation concentrations. Minimal residual mass remains beneath the site. Down-gradient wells remain below Water Quality Objectives (WQOs) and the groundwater plume is stable to decreasing in aerial extent.

The petroleum release is limited to the shallow soil, low permeable fractures in bedrock, and shallow groundwater. 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. A potential receptor survey identified an unnamed lake within 1,000 feet east of the groundwater plume boundary. The closest supply well is greater than four miles to the north in the City of Berkeley, California. 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.

The Site is proposed for residential development and may include construction of senior living facility in the southern portion of the Site and a parking lot in the northern portion of the Site. Proposed structures will include slab-on-grade foundations.

Any remaining petroleum constituents do not pose significant risk to human health, safety or the environment under current conditions or if the site is developed as proposed.

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 WQOs will be achieved within a reasonable time frame.

- Petroleum Vapor Intrusion to Indoor Air – Site meets **CRITERIA (2) a, Scenario 4**. Direct soil gas sampling was conducted on site for both soil gas and subslab soil gas for neighboring residences. Concentrations of benzene, ethylbenzene, and naphthalene in soil gas samples collected at five feet are below residential soil gas screening levels. Oxygen in the bioattenuation zone is greater than 4 percent.

- Direct Contact and Outdoor Air Exposure – Site meets **CRITERIA (3) a**. Maximum concentrations of benzene and ethylbenzene in soil are less than or equal to those listed in Table 1. The estimated naphthalene concentrations in soil meet the thresholds in Table 1 and the Policy criteria for direct contact by a factor of ten. It is highly unlikely that naphthalene concentrations in the soil, if any, exceed the threshold.

Objections to Closure

Alameda County Health Care Services Agency (Alameda County) staff objects to UST case closure because:

1. Conceptual Site Model is not complete – hydrogeology is not adequately defined.
   RESPONSE: The existing monitoring well network at the Site is sufficient to delineate the vertical and horizontal extent of the groundwater plume. The monitoring well network is screened in both unconfined alluvium (shallow zone) and in semi-confined fractured bedrock (deep zone). It is likely there is sufficient interconnection of the fractures that the deep zone monitoring wells accurately define the deeper groundwater zone.

2. Residual free product (separate phase hydrocarbons) may reside in bedrock fractures.
   RESPONSE: Boring log data identify that the majority of the petroleum hydrocarbons in soil and bedrock are approximately between 10 and 15 feet below ground surface (bgs) near the former gasoline USTs. Free product, totaling 0.02 feet, existed in bedrock well MW-3C in only June 2007 and not subsequent sampling events. The DPE and AS remediation systems at the Site successfully removed petroleum hydrocarbons from the soil/bedrock and groundwater to the maximum extent practical. Additionally, groundwater concentrations after remediation are significantly lower than those prior to remediation indicating that if residual free product remains, it has not affected groundwater nor be a threat to human health, safety, and the environment.

3. Secondary source is not removed to the extent practical – areas have responded poorly to remedial methods.
   RESPONSE: The DPE and AS remediation systems have removed over 1,300 pounds of hydrocarbons from the subsurface and have demonstrated successful cleanup of the site. Groundwater and soil vapor concentrations have significantly reduced. It is likely that there is a residual secondary source area in the bedrock fractures; however, the areas are minimal and additional remedial efforts are not warranted.

4. Groundwater concentrations show rebound following DPE system shutdown.
   RESPONSE: Groundwater concentrations have exhibited rebound since the DPE and AS systems were shutdown, which is a typical characteristic for any remediation system. However, groundwater concentrations are significantly reduced and have not returned to pre-remediation concentrations. Recent groundwater concentrations from December 2012, suggest that the rebound has peeked and natural, declining trends, like those observed prior to DPE and AS remediation, have returned.

5. Soil vapor samples were not collected correctly and total petroleum hydrocarbons (TPH) in bioattenuation zone is unknown.
   RESPONSE: Over 10 direct soil gas samples were collected on site for both soil gas and subslab soil gas for neighboring residences in September 2012. Concentrations of benzene, ethylbenzene, and naphthalene in soil gas samples collected at five feet are below residential soil gas screening levels identified in Scenario 4 of the Policy. Oxygen in the bioattenuation zone is greater than 4 percent.

6. Petroleum Constituents in soil are unknown for analysis of Direct Contact; naphthalene is unknown in soil.
   RESPONSE: There are sufficient soil samples from 0 to 10 feet in the case record to demonstrate the Site is low-risk and meets Criteria 3 (a) of the Policy. Four soil samples from the 5 to 10 foot interval had TPH concentrations that slightly exceed 100 milligrams per kilogram (mg/kg). However, these samples were collected in 2006, DPE and AS remediation has been conducted at the Site since that date, and natural attenuation has likely reduced the concentrations even further. Soil vapor data collected from the Site in September 2012 did not identify any naphthalene in the soil vapor phase. See Attachment 2 – Evaluation of Risk Criteria for explanation of sites without naphthalene values.

7. A revised corrective action plan (CAP) is requested for the new proposed senior living development with slab-on-grade buildings.
   RESPONSE: The Site demonstrates that it meets the closure requirements of the Policy and a CAP for further remediation at the Site is not warranted.

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: _____ 3/21/2013
Steve McMasters, PG No. 8054 — Date
Engineering Geologist

Reviewed By: _____ 3/21/13
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
Media-Specific Criteria 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 southwest corner of the intersection of Broadway and Coronado Avenue in Oakland, California.
- The Site is currently vacant. The former service station foundation and one dispenser island foundation remains on Site.
- The Site is bounded by residential to the west and northwest; and commercial to the northeast, east, and south.
- Nature of Contaminants of Concern: Petroleum hydrocarbons only.
- Primary Source of Release: UST system
- Discovery Date: 1987
- Release Type: Petroleum[2]
- Free Product: From 2006 to 2007, groundwater well STMW-4 contained free product and was destroyed in 2007. Replacement well MW-4A has not contained free product since construction in 2007. Groundwater well MW-3C contained 0.02 feet of free product in June 2007, but not in subsequent sampling events.

Table A. USTs:

Tank No.	Size	Contents	Status	Date
1	8,000 gallon	Gasoline	Removed	1990
2	8,000 gallon	Gasoline	Removed	1990
3	8,000 gallon	Gasoline	Removed	1990
4	500 gallon	Waste Oil	Removed	1990

Receptors

- Groundwater Basin: Santa Clara Valley (East Bay Plain subbasin).
- Groundwater Beneficial Uses: Municipal and domestic supply (MUN); agricultural supply (AGR); industrial service supply (IND); and industrial process supply (PRO).
- Designated Land Use: Residential.
- Public Water System: East Bay Municipal Utility District.
- Distance to Nearest Surface Waters: An unnamed lake is located approximately 900 feet east of the Site. The lake is cross-gradient from the groundwater plume and hydraulically upgradient of the Site.
- Distance to Nearest Supply Wells: No supply wells exist within 1,000 feet of the Site.

Geology/ Hydrogeology

- Average Groundwater Depth: ~11 feet bgs
- Minimum Groundwater Depth: ~5 feet bgs
- Groundwater Flow Direction: South to Southwest
- Geology: Site overlies alluvial and fill deposits and the Franciscan Complex bedrock. The alluvial and fill consists of clay, silt, sand and gravel ranging from 2 to 20 feet in thickness. The Franciscan

[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.)

Complex bedrock; consisting of sandstone, siltstone, and serpentinite; underlies the alluvial and fill deposits.

- Hydrogeology: Groundwater beneath the site is unconfined to semi-confined and exists in both the fill and alluvium and within low permeable fractures in the underlining bedrock.

Corrective Actions

- Four USTs removed from the site in 1990.
- During the 1990 UST system removal, approximately 700 tons of impacted soil were removed, treated onsite, and used for backfill.
- DPE and AS remediation systems were operated at the site from 2010 to 2012.
- The systems were terminated once asymptotic conditions were achieved.
- A November 2012 rebound test verified asymptotic conditions.

Table B. Concentrations of Petroleum Constituents in Soil

Constituent	Maximum 0-5 feet bgs (mg/kg)	Maximum 5-10 feet bgs (mg/kg)
Benzene	0.0061	0.24
Ethylbenzene	0.0057	13
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	Date	DTW (ft.)	TPHg (µg/L)	TPHd (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)
Shallow Wells									
MW-3A	12/31/2012	10.10	640	180	**27**	1.3	5.7	7.4	**<15**
MW-4A	12/31/2012	8.96	<50	<50	**1.1**	<0.5	<0.5	<0.5	<5.0
MW-5A	7/13/2012	11.12	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
MW-6A	7/13/2012	8.23	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
MW-8A	12/31/2012	8.65	<50	<50	**8.2**	<0.5	<0.5	<0.5	<5.0
MW-9A	7/12/2012	12.31	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
MW-10A	7/12/2012	10.08	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
Deep Wells									
MW-1	12/31/2012	7.28	330	96	**3.5**	<0.5	0.95	1.2	<5.0
MW-2C	7/13/2012	10.26	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
MW-3C	12/31/2012	11.15	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
MW-5B	7/13/2012	13.70	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
MW-5C	7/13/2012	13.90	<50	<50	**2.3**	<0.5	<0.5	<0.5	<5.0
MW-7B	12/31/2012	11.01	74	120	<0.5	<0.5	<0.5	<0.5	<5.0
MW-7C	12/31/2012	11.42	140	<50	0.88	<0.5	<0.5	<0.5	<5.0
MW-8C	7/13/2012	12.05	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
MW-9C	7/12/2012	11.95	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0

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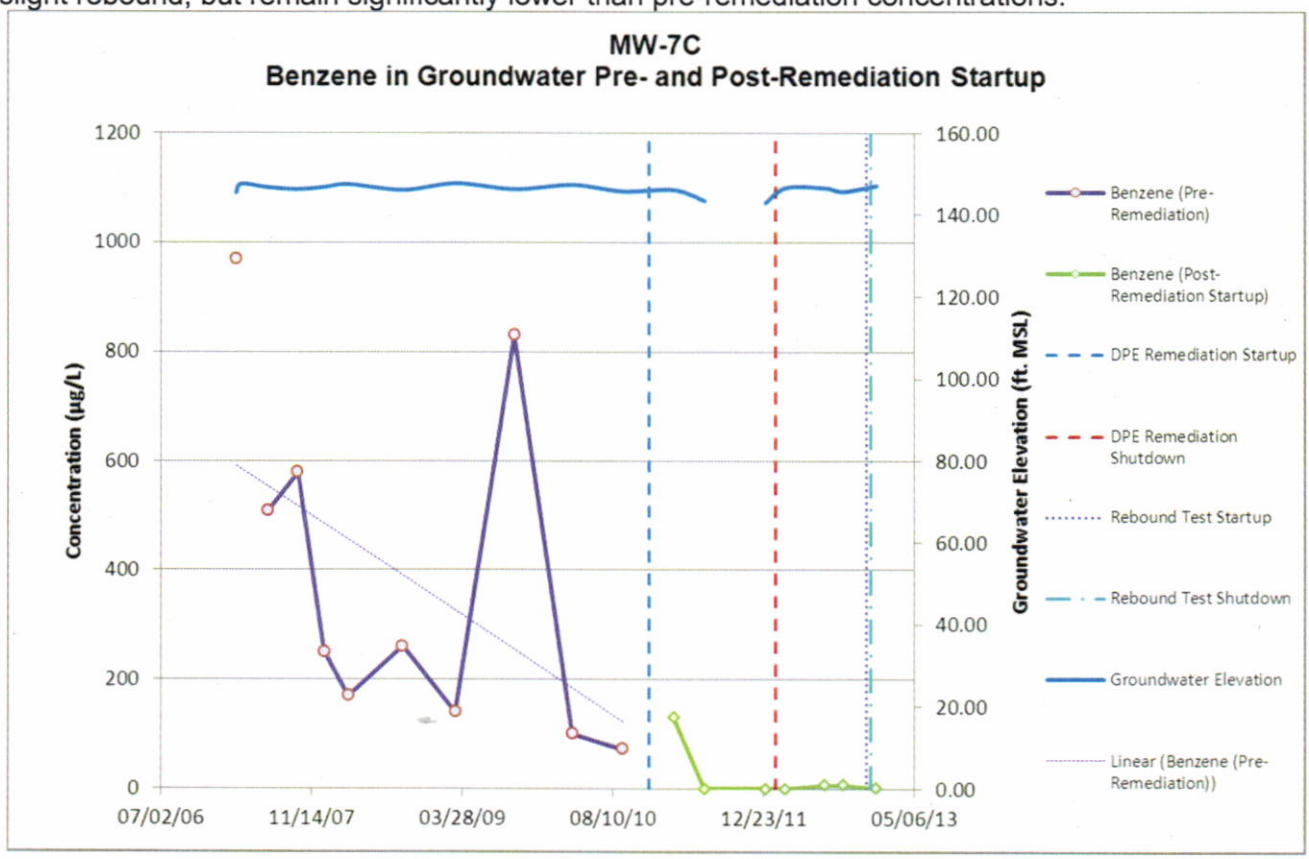
Table C. Concentrations of Petroleum Constituents in Groundwater (cont.)

Well ID	Date	DTW (ft.)	TPHg (µg/L)	TPHd (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)
Remediation Wells (Deep Zone)									
AS-1	7/13/2012	11.38	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
DPE-1	12/31/2012	8.41	190	150	**1.4**	<0.5	<0.5	<0.5	<5.0
DPE-2	12/31/2012	8.80	170	83	**16**	0.71	0.72	5.2	<5.0
DPE-3	12/31/2012	9.46	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
DPE-4	12/31/2012	9.83	190	<50	0.72	0.86	0.62	11	<5.0
DPE-5	12/31/2012	9.42	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
DPE-6	12/31/2012	8.25	1,600	540	**2.1**	2.4	4.6	2.5	**<15**
WQOs			**3,000**	**3,000**	**1**	**150**	**700**	**1,750**	**5**

Notes:
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 Trends:

Benzene reported in groundwater at the Site demonstrates stable or decreasing trends over time. Since termination of the DPE and AS systems in January 2012, benzene concentrations have shown a slight rebound, but remain significantly lower than pre-remediation concentrations.



Evaluation of Risk Criteria

- Maximum Petroleum Constituent Plume Length above WQOs: The groundwater plume is approximately 160 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 remediation. Site conditions demonstrate that the residual petroleum constituents in soil, bedrock, 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. Site-specific conditions satisfy all of the applicable characteristics and criteria for petroleum vapor intrusion to indoor-air under class a. scenario 4.
- 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).

Mehdizadeh Property
5175 Broadway, Oakland