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November 5, 2012

Ms. Jeanine Townsend
Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor (95814)
P.O. Box 100
Sacramento, CA 95812-0100
(*Sent via E-mail to: commentletters@waterboards.ca.gov*)

Subject: **Comment Letter - Chevron #9-0329 Case Closure Summary**, Revised Notice of Opportunity for Public Comment; Underground Storage Tank Cleanup Fund Case Closure Recommendation; Claim Number 6001; Fuel Leak Case No. RO0000269; Global ID # T0600101885; Chevron #9-0329, 340 Highland Avenue, Piedmont, CA 94611

Dear Ms. Townsend:

Alameda County Environmental Health (ACEH) staff has received the *Notice of Opportunity for Public Comment* dated August 31, 2012, and the *Revised Notice of Opportunity for Public Comment,* dated September 5, 2012, signed by Lisa Babcock, Fund Manager of the Underground Storage Tank Cleanup Fund (USTCF or Fund). The purpose of these notifications is to inform interested parties of 1) the USTCF's intent to recommend closure of the subject site to the California State Water Resources Control Board (SWRCB) at a future Board meeting, and 2) the sixty day public comment period on the Fund's *UST Case Closure Summary*, dated August 31, 2012, and signed by Lisa Babcock. According to the *Revised Notice of Opportunity for Public Comment*, written comments to the SWRCB on the Fund's *Case Closure Summary* must be received by 12:00 noon on November 5, 2012. This letter herein transmits ACEH's comments.

Requirements for Investigation and Cleanup of Unauthorized Releases from USTs

ACEH reviewed the USTCF's *UST Case Closure Summary*, including *Attachment 1: Compliance with State Water Board Policies and State Law* (i.e., the SWRCB's Low-Threat UST Case Closure Policy Paper Check List), and *Attachment 2: Summary of Basic Site Information (Conceptual Site Model)* in conjunction with the case files for the above-referenced site. A complete record of the case files (i.e., regulatory directives and correspondence, reports, data submitted in electronic deliverable format, etc.) can be obtained through review of both the SWRCB's Geotracker database, and the ACEH website at http://www.acgov.org/aceh/index.htm.

ACEH has additionally reviewed the requirements for investigation and cleanup of unauthorized releases from USTs contained in the following resolutions, policies, codes, and regulations:

- SWRCB Draft Resolution 2012-xx, *Additional Actions to Improve the UST Cleanup Program*, to be considered for adoption by the SWRCB at their November 6th, 2012 meeting;
- SWRCB Draft *Plan for Implementation of Low-Threat UST Case Closure Policy and Additional Program Improvements*, to be considered for adoption by the SWRCB at their November 6th, 2012 meeting;
- SWRCB Resolution 2012-0016, *Approve a Substitute Environmental Document and Adopt a Proposed Water Quality Control Policy for Low-Threat Underground Storage Tank Case Closure*, adopted on May 1, 2012; and effective August 17, 2012;

- California Code of Regulations (CCR) Title 23, Article 5 and Article 11, UST Regulations, as amended and effective July 1, 2011;
- California Health & Safety Code (HS&C) Sections 25280-15299.8, Underground Storage of Hazardous Substances, as amended on January 1, 2011;
- SWRCB Resolution 2009-0081, *Directing Additional Actions to Improve Administration of the UST Cleanup Fund and UST Cleanup Program*, adopted November 17, 2009;
- SWRCB Resolution 2009-0042, *Actions to Improve Administration of the UST Cleanup Fund and UST Cleanup Program*, adopted May 19, 2009;
- SWRCB Resolution 1992-0049, *Policies and Procedures for the Cleanup and Abatement of Discharges under California Water Code Section 13304*, as amended on April 21, 1994 and October 2, 1996.

Application of Case Review Tools

ACEH's case closure evaluation was also guided by the application of the principles and strategies presented in the *Leaking Underground Fuel Tank Guidance Manual* (CA LUFT Manual), dated September 2012, developed by the SWRCB "…[t]o provide guidance for implementing the requirements established by the Case Closure Policy" (Low Threat Closure Policy or LTCP) and associated reference documents including but not limited to:

- *Technical Justification for Vapor Intrusion Media-Specific Criteria*, SWRCB dated March 21, 2012;
- *Technical Justification for Groundwater Media-Specific Criteria*, SWRCB dated April 24, 2012;
- *Technical Justification for Soil Screening Levels for Direct Contact and Outdoor Air Exposure Pathways*, SWRCB dated March 15, 2012;
- *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air, Final* DTSC, dated October, 2011.

ACEH also utilized other case review tools developed by the SWRCB to aid in determining compliance of the subject fuel leak site with LTCP criteria, including both paper and electronic policy checklists. While ACEH has found the CA LUFT Manual to be a valuable tool, we are concerned that the over simplicity of the SWRCB checklists can result in erroneous conclusions regarding recommendations for case closure and a lack of transparency regarding the decision making process. Therefore, to attempt to address this issue, ACEH staff have enhanced the LTCP checklist by integrating the requisite level of questioning to enable consistent application of the LTCP, ensure that decisions are founded in appropriate technical basis, identify impediments to closure, improve the efficiency of the UST cleanup program, and document the decision making process as transparently as possible for all interested parties. This enhanced checklist, entitled the *Low Threat UST Case Closure Policy Compliance and Identification of Impediments to Case Closure Checklist,* was utilized by ACEH staff during our evaluation of the USTCF's *Case Closure Summary* and the Fund's recommendation for case closure of the subject site, and is included as an attachment to this response letter. ACEH is committed to implementing the LTCP and continuing to develop this tool to facilitate case review and identification of impediments to closure, and thereby make the cleanup and closure process more efficient.

Summary of ACEH's Review of the USTCF's UST Case Closure Summary

The results of ACEH's case closure review, indicates the USTCF closure recommendation under the LTCP to be lacking an appropriate technical basis. ACEH does not agree with the USTCF's technical analysis presented in their *UST Case Closure Summary.* ACEH's review indicates that the Conceptual Site Model (CSM) is deficient and that the site is uncharacterized in a number of elements. Our concerns include but are not limited to potential impacts to a local creek and public park due to the mismanagement and resultant discharge of highly contaminated groundwater (observed sheen or light non-aqueous phase liquid [LNAPL]) that daylights (or surfaces) at the site; potential and known impacts to existing domestic and irrigation wells downgradient of the site; lack of identification of an apparent diesel source; lack of characterization of secondary sources and shallow soil including analysis for the analytical suite of

chemicals associated with unauthorized releases of waste oil and diesel fuel including PAHs and napthalene. Details of our analysis are provided in the narrative section below and in the accompanying attachments including the *Low-Threat UST Case Closure Policy Compliance and Identification of Impediments to Case Closure Checklist*.

ACEH presented our analysis of site data and our concerns about the appropriateness of recommending the site for closure under the LTCP to the USTCF prior to their issuance of the *UST Case Closure Summary* for the subject site. Although we were told that our objections would be incorporated into the *UST Case Closure Summary* for the subject site, our review of the document indicates that the USTCF staff has inappropriately oversimplified our technical evaluation.

ACEH's Review of the USTCF's Compliance with Public Notification Requirements

While the USTCF has made the *UST Case Closure Summary* available for public comment on the SWRCB's website, it appears to have failed to notify in a timely basis all interested parties, *including the actual site property owner,* as required by the LTCP, CCR Chapter 16, and Chapter 6.7 of the H&SC*.*

According to the LTCP Notification Requirements "municipal and county water districts, water replenishment districts, special act districts with groundwater management authority, agencies with authority to issue building permits for land affected by the petroleum release, and owners and occupants of all parcels adjacent to the impacted property shall be notified of the proposed case closure and provided a 60 day period to comment."

Further, it appears the USTCF has not conducted public notification requirements in accordance with the SWRCB and Regional Water Quality Control Board's April 2005 guidance document entitled *Final Draft Public Participation at Cleanup Sites*. According to this document "…[t]he level of public participation effort at a particular site should be based on the site's threat (to human health, water quality, and the environment), the degree of public concern or interest in site cleanup, and any environmental justice factors associated with the site. There may be more public concern or interest about a site when: contaminants have migrated or are likely to migrate off-site…".

The USTCF's *Revised Notice of Opportunity for Public Comment*, dated September 5, 2012, states that "a copy of the *Case Closure Summary* has been provided to the owner/operator, environmental consultant of record, the local agency that has been overseeing corrective action, the local water purveyor, and the water district specified by H&SC section 25299.39.2 subdivision (a)(1)." Concerned by this limited list of parties, ACEH contacted the USTCF and requested the list of recipients that the *Revised Notice of Opportunity for Public Comment* was sent to. Our review of this list of recipients indicates a lack of notification of the *actual site property owner, several downgradient public schools and multiple well owners*.

Case Closure Analysis Using the LTCP General and Media Specific Criteria

ACEH's case closure analysis is provided in the narrative section below and in the following attachments, including the *Low-Threat UST Case Closure Policy Compliance and Identification of Impediments to Closure Checklist*.

General Criteria a: The unauthorized release is located within the service area of a public water system.
The water provider is the East Bay Municipal Utility District; however, the City of Piedmont Park (Piedmont Park) located immediately across Highland Avenue from the subject site, has a fully functioning irrigation well. The park well is located approximately 580 feet from the subject site's groundwater monitoring well C-2 in a down- to cross-gradient position. At least four groundwater sampling events of the park well have occurred since 2007. In January 17, 2007 260 micrograms per liter (µg/l) of total petroleum hydrocarbons as diesel (TPHd), 0.7 µg/l of toluene, and 0.5 µg/l of total xylenes were detected in groundwater samples collected from the park well. During two subsequent sampling events conducted on March 25, 2011 and May 4, 2011, no contaminants were detected above laboratory reporting limits. However, on May 22, 2012 the well was resampled in connection with the City of

Piedmont site (Fuel Leak Case No. RO0003047), and 52 µg/l of total petroleum hydrocarbons as gasoline (TPHg) was detected. The source location of this contamination has not been determined. This well is not screened in a shallow zone, consequently the well documents hydrocarbon impacts at depth.

Based on a 1998 well survey a minimum of three additional wells appear to be present downgradient within 1,000 feet of the release, including two classified as domestic. Groundwater from these wells has not been tested to determine if they have been impacted by the petroleum release at the subject site. Additional water supply wells are understood to have been installed since 1998 in the general vicinity, but they have not been considered in an updated CSM to determine if they are located within a 1,000 foot distance.

General Criteria b: The unauthorized release consists only of petroleum.

The unauthorized release consists of petroleum hydrocarbons originating from gasoline USTs and waste oil USTs. An apparent diesel source remains unidentified at the site.

General Criteria c: The unauthorized ("primary") release from the UST system has been stopped.

The primary source has not been identified; however, three releases have been identified from soil and groundwater analytical concentration trends collected from the site's groundwater monitoring wells, including:

- A pre-1983 non-oxygenated fuel release (LNAPL discovered in well C-2 during well installation and development);
- Increasing TPHg and benzene trends in well C-2 that peaked in 1993 – 1995; and
- Increasing methyl tertiary butyl ether (MTBE) concentration trends that peaked in 1997.

A fourth release to soil is documented from soil samples collected during the waste oil UST removal conducted in 1999; however, required analysis for waste oil constituents including motor oil and related compounds (chlorinated volatile organic compounds [VOCs], semi-volatile organic compounds [SVOCs], metals, polychlorinated biphenyl [PCB], creosote, etc.) do not appear to have been included in analytical testing. The source of recently discovered diesel contamination has not been located, investigated, or characterized.

Based on concentrations of contaminants in groundwater, the gasoline release has been stopped. Residual soil contamination appears to be the source of on-going groundwater contamination; however the gasoline soil source has not been characterized.

General Criteria d: Free product has been removed to the maximum extent practicable.

LNAPL was reported at a thickness of ¾-inch (0.06 feet) at the time of development of well C-2. However, as onsite wells appear to be submerged by between 4 to nearly 7 feet (see discussion in General Criteria e), potentially up to 7 feet of product may have been present at that date, and not been detected. Analytical data indicates that contaminant concentrations are on a declining trend at the site; however, technical literature, including that cited in the SWRCB's CA LUFT Manual, suggest that submerged wells do not produce representative groundwater concentrations or determine the thickness of LNAPL.

The *UST Case Closure Summary* notes the November 16, 2006 Cambria CSM update hypothesizing that the UST tank pit is filled with ponded groundwater as a result of the excavation of the pit into bedrock (i.e., creating a bathtub effect). This interpretation, which is not validated by available soil bore lithologic data, would also indicate that well C-2 is submerged by up to 7 feet. A well in this condition would not be capable of collecting required representative groundwater or LNAPL characterization data. In submerged well conditions LNAPL may be excluded from well entry by the refilling from the most productive (permeable) water zone (see cited technical literature, including that cited in the CA LUFT Manual). The presence of sheen and odor observed in groundwater monitoring wells during the May 2012 groundwater sampling event indicate substantial residual impact to soil. ACEH notes that the shallow source zone remains uncharacterized in multiple source areas as required by the policy and therefore does not meet the LTCP requirements.

The *Case Closure Summary* also indicates that well C-2 dewaters with purging on a *regular basis*. Data indicates that the well has been dry during that the last three sampling events (September 2011 to March 2012). These conditions represent a change in groundwater conditions not previously captured at the site. A complete review of past groundwater monitoring events indicates that the well has dewatered four times out of the 39 events that have been conducted since January 1995 (The majority of groundwater events conducted prior to the January 1995 date do not provide well purging details).

Please refer to Attachment 1, *Technical References Table* for a list of relevant state-of-the-practice technical references for appropriate well screen selection for LNAPL determination, and the significance of the absence of LNAPL in a well (and other relevant reference topics).

General Criteria e: A conceptual site model has been developed.

While a CSM was produced in 2003 and updated slightly in 2006, the CSM does not identify or address the following inconsistencies or data gaps that have been identified in more recent data as per the guidance presented in the CA LUFT Manual:

- Identification of and discussion of well conditions. As discussed above, submerged wells are incapable of collecting representative groundwater or LNAPL thickness measurements. Data documenting submerged conditions in wells at the site did not become available until February 2008, and thus this condition was not evaluated in the 2003 CSM and 2006 CSM update. Available generic (non-specific) well construction details indicate wells C-1 to C-4 were installed to depths of 15 feet below ground surface (bgs), with well screens installed between 5 and 15 feet bgs; however, field well depth measurements indicate these wells were installed to 17 feet bgs, thus the screen may be installed between 7 to 17 feet bgs, (implied by selection of a standard screen section length). Although no well construction details are available for wells C-1, C-2, and C-3. Given that depth to water at the site ranges from 0.25_ to 1.4 feet bgs, the site wells may consequently be submerged 6 to 7 feet. The exception to these apparently submerged water-table wells, is well MW-6 which was artesian shortly after installation and was therefore decommissioned; no other site wells have been artesian. The November 16, 2006 Cambria CSM update report states that there appears to be no hydraulic connection between well MW-6 and other site wells. This further suggests that well C-2 acts more as a submerged water-table well. Well C-2 is also currently measured to be 11.12 feet in depth and therefore contains up to approximately 6 feet of sediment. See Attachments 2, 3, and 4 for well construction details.
- Source area characterization. The upper five feet in a source area remains uncharacterized. Inherent inconsistency between soil bores C-A and C-E, which describe contaminated fill sand with a moderate to strong chemical odor between the depths of 2 and 12 feet and the presence of brick and shell fragments, and the 2012 geophysical survey which did not identify any fill soil or USTs in the same location of the site. Concentrations up to 1,600 milligrams per kilogram (mg/kg) TPHg, and 0.11 mg/kg benzene were detected in soil samples collected from the contaminated fill sand source area at depths of 5.5 feet bgs and deeper. A concentration of 220 mg/kg TPHg and 0.051 mg/kg benzene were detected in soil samples collected from gore C-E at 11.5 feet bgs. This is a data gap that affects the appropriate categorization of the site within the LTCP and is an impediment to implementation of the LTCP.
- Removal and off-site disposal of impacted soil. The *UST Case Closure Summary* acknowledges that an unknown number of USTs of unknown size appear to have been removed from the site, based on the July 2012 geophysical survey report. The removal and offsite disposal of soil associated with these USTs is not documented, would not be expected in the pre-environmental era, and the backfilled soil (a source area) is uncharacterized. This is a data gap that affects the appropriate categorization of the site within the LTCP and is an impediment to implementation of the LTCP. The *UST Case Closure Summary* states that impacted soil was removed from the site; this is not documented in the case file, and is contrary to standard practices in the pre-environmental era.
- Diesel source. Diesel has not previously been associated with the site, however, has been detected in well C-2, even with the use of silica gel cleanup, at elevated concentrations (recently at 5,700 µg/l). The USTCF misstates that the City of Piedmont site is upgradient of the subject site and is the source of the diesel contamination. The City of Piedmont site is not up-gradient of the site, but is down-gradient to cross-gradient and thus cannot be the source of the diesel

contamination. Well C-5 is positioned between the two source areas of the two sites, is not submerged to the extent of well C-2, and is nondetectable for TPHd. The source of the TPHd has not been located, nor has the extent of soil contamination been characterized. The discovery of a debris pit at the upgradient edge of the subject site by the geophysical survey may be a potential source for this contamination and remains uncharacterized.

- Waste oil USTs. The presence of analytes known to be associated with waste oil USTs do not appear to have been previously investigated in soil or groundwater. Concentrations up to 1,600 mg/kg of total petroleum hydrocarbons as motor oil (TPHmo), 190 mg/kg TPHd, 4.2 mg/kg TPHg, 4.0 mg/kg MTBE; and non-detect for benzene, toluene, ethylbenzene, and xylenes (BTEX) (collected at unknown depths) have been detected in soil samples; however, chlorinated VOCs, SVOCs, metals, PCB, creosote, etc. have not been included in the analytical suite. This is a LTCP data gap.
- Napthalene concentrations. The *Risk Criteria* section of the *UST Case Closure Summary* dismisses the lack of naphthalene data as relevant due to the belief that the release is entirely gasoline, and thereby fails to recognize the presence of TPHd and TPHmo detections and their likely effect on naphthalene concentrations. This is a LTCP data gap.
- Disposal of contaminated groundwater. The disposal method associated with the onsite surfacing of potentially significantly contaminated groundwater or disposal of "Grease Interceptor" drain liquids has not been addressed. Discharge to both sanitary sewers and storm drains has been suggested. Disposal of the liquids to the storm drain appears to be present based on photos in Attachments 5 & 6. Discharge to Piedmont Creek directly downgradient at an approximate distance of 336 feet has not been eliminated and would be characterized as either a nuisance or an ecologic concern under the LTCP. ACEH notes the interceptor trench is not called a French Drain, for control of nuisance waters, but a Grease Interceptor drain, implying "Grease" (assumed to be sheen or thick LNAPL, etc.) was observed in the discharging waters as of late 2006. At a minimum this site will require an institutional control for this condition potentially with periodic regulatory review, if case closure is considered for this site.

General Criteria f: Secondary source removal has been addressed. The secondary source is the petroleum-impacted soil, free product, or groundwater that acts as a long-term source releasing contamination to the surrounding area. Unless site conditions prevent secondary source removal (e.g. physical or infrastructural constraints exist whose removal or relocation would be technically or economically infeasible), petroleum-release sites are required to undergo secondary source removal to the extent practicable.

Secondary source zone removal has not been conducted nor addressed at the site. The USTCF states in the *UST Case Closure Summary* that impacted soil has been removed from the site. To date the removal of contaminated soil from the site has not been documented. The disposal of soil excavated during the removal of the waste oil UST remains undocumented. The disposal of liquids associated with this action is documented and manifested. Reuse of contaminated soil is presumed without required documentation and is considered a data gap.

In the *UST Case Closure Summary* the USTCF acknowledges that an unknown number of USTs of unknown size appear to have been removed from the site, based on the July 2012 geophysical survey report. The removal and offsite disposal of soil associated with these USTs is not documented, and would not be expected in the pre-environmental era. The backfilled soil (in a source area) remains uncharacterized. This is a data gap that can affect the appropriate implementation of the LTCP.

General Criteria g: Soil or groundwater has been tested for MTBE and results reported in accordance with Health and Safety Code section 25296.15.

Soil and groundwater has been tested for MTBE.

General Criteria h: Nuisance as defined by Water Code section 13050 does not exist at the site.

Based on surfacing of potentially significantly contaminated groundwater as documented in the attached photographs (previously discussed in General Criteria e, Attachments 5 & 6), public nuisance factors can and appear to still be present at the site. Pavement at this location has been repaired; however, discharge to the storm drain system and the local creek appear to be present. Without functioning

engineering and institutional controls, and based on the definition of nuisance contained in Water Code section 13050, nuisance issues appear to be present at the site.

Media-Specific Criteria 1. Groundwater: If groundwater with a designated beneficial use is affected by an unauthorized release, to satisfy the media-specific criteria for groundwater, the contaminant plume that exceeds water quality objectives must be stable or decreasing in areal (sic) extent, and meet all of the additional characteristics of one of the five classes of sites listed in the Policy. A plume that is "stable or decreasing" is a contaminant mass that has expanded to its maximum extent: the distance from the release where attenuation exceeds migration.

While contaminant concentrations in groundwater appear to suggest a declining trend at the site, submerged wells cannot produce representative groundwater concentrations or determine the thickness of LNAPL (See Attachment 1; *Technical References Table*, and the CA LUFT Manual). In the *UST Case Closure Summary*, the USTCF staff selected Class 5 of the groundwater-specific criteria to demonstrate compliance with the LTCP. This consists of a review of site-specific conditions coupled with a finding that the contaminant plume poses a low threat to human health and safety, and safety to the environment. The USTCF's review and selection of this criteria is based on an incomplete data set (uncharacterized soil in the upper 5 feet as required by the policy), and was generated from wells with screens incapable of answering the requisite question (LNAPL or valid groundwater concentrations due to inappropriately screened wells as discussed in multiple technical references, including the CA LUFT Manual). Existing characterization of the site does not support this conclusion.

Media-Specific Criteria 2. Petroleum Vapor Intrusion to Indoor Air: The low-threat vapor-intrusion criteria in the Policy apply to release sites and impacted or potentially impacted adjacent parcels when: (1) existing buildings are occupied or may be reasonably expected to be occupied in the future, or (2) buildings for human occupancy are reasonably expected to be constructed in the near future.

The site is an active gasoline service station, and the groundwater flow path does not suggest impacts to adjacent parcels by vapor concentrations derived from groundwater.

Media-Specific Criteria 3. Direct Contact and Outdoor Air Exposure. Release sites where human exposure may occur satisfy the media-specific criteria for direct contact and outdoor air exposure and shall be considered low-threat if they meet any of the following:

a. Maximum concentrations of petroleum constituents in soil are less than or equal to those listed in Table 1 for the specified depth below ground surface (bgs). The concentration limits for 0 to 5 feet bgs protect from ingestion of soil, dermal contact with soil, inhalation of volatile soil emissions and inhalation of particulate emissions, and the 5 to 10 feet bgs concentration limits protect from inhalation of volatile soil emissions. Both the 0 to 5 feet bgs concentration limits and the 5 to 10 feet bgs concentration limits for the appropriate site classification (Residential or Commercial/Industrial) shall be satisfied. In addition, if exposure to construction workers or utility trench workers are reasonably anticipated, the concentration limits for Utility Worker shall also be satisfied; or

b. Maximum concentrations of petroleum constituents in soil are less than levels that a site specific risk assessment demonstrates will have no significant risk of adversely affecting human health; or

c. As a result of controlling exposure through the use of mitigation measures or through the use of institutional or engineering controls, the regulatory agency determines that the concentrations of petroleum constituents in soil will have no significant risk of adversely affecting human health.

The lack of source area characterization between 0 to 5 feet in depth in source areas indicates sufficient data does not exist yet to demonstrate that site characterization is complete. The *UST Case Closure Review* specifically utilizes option b above to satisfy the LTCP criteria; comparison of maximum concentrations in soil to a site specific risk assessment. However, the risk assessment does not appear to have utilized maximum concentrations due to insufficient characterization in the shallow soil and therefore a data gap in USTCF's implementation of the LTCP for this site exists.

The *Risk Criteria* section of the *UST Case Closure Review* indicates that soil vapor has been sampled. ACEH is not aware of any soil vapor data for the site. The data referenced by USTCF appears to be for another site; therefore any conclusions about health risks at the site drawn from this data are invalid. Availability of soil vapor data would be insightful in determining the extent of shallow soil impacts at the

site and would provide multiple lines of evidence that all technical references indicate are appropriate, including the CA LUFT Manual ("Risk Evaluation and Risk Management" section).

The *Risk Criteria* section of the *UST Case Closure Review* also dismisses the lack of naphthalene concentrations as relevant believing the release to be limited to gasoline, and therefore fails to recognize the presence of TPHd and TPHmo detections and their likely effect on naphthalene concentrations.

Low-Threat Case Closure: If a case has been determined by the regulatory agency to meet the criteria in this policy, the regulatory agency shall notify responsible parties that they are eligible for case closure and that the following items, if applicable, shall be completed prior to the issuance of a uniform closure letter specified in Health and Safety Code section 25296.10:

a. **Notification Requirements:** Municipal and county water districts, water replenishment districts, special acts districts with groundwater management authority, agencies with authority to issue building permits for land affected by the petroleum release, and the owners and occupants of all parcels adjacent to the impacted property shall be notified of the proposed case closure and provided a 60 day period to comment.

b. **Monitoring Well Destruction:** All wells and borings installed for the purpose of investigating, remediating, or monitoring the unauthorized release shall be properly destroyed prior to case closure unless a property owner certifies that they will keep and maintain the wells or borings in accordance with applicable local or state requirements.

c. **Waste Removal:** All waste piles, drums, debris and other investigation or remediation derived materials shall be removed from the site and property managed in accordance with regulatory agency requirements.

A review of the *Notice of Opportunity for Public Comment* dated August 31, 2012*,* and the *Revised Notice of Opportunity for Public Comment,* dated September 5, 2012 appears to indicate that only the Responsible Party causing the release has been provided the opportunity to comment; neglecting the current property owner and other RPs of record. While ACEH has received (October 22, 2012) a list of immediately adjacent property owners, there is no indication that these interested parties were included in the original mailing. In fact the actual property owners of the site were not included in the list received from the USTCF. Interested parties that would be notified (RPs of record, immediately adjacent neighbors, owners of all adjacent potentially impacted property above a plume, and property tenants when appropriate) do not appear to have been included in USTCF's list. Notification of each of these potentially interested parties is required by California H&SC and the SWRCB and Regional Water Quality Control Board's April 2005 guidance document entitled *Final Draft Public Participation at Cleanup Sites*. The lack of clarity or transparency is contrary to the intent of the *Low Threat Closure Policy*. Please be aware that as standard ACEH procedure, notified individuals are and remain publically available in the electronic case record. ACEH has attached a copy of an appropriate public notification area map and a list of owners and tenants (Attachment 7), which for this site this includes several downgradient public schools and multiple documented well owners.

Path to Closure Plan

ACEH believes that the data gaps identified above and in the attached *Low-Threat UST Case Closure Policy Compliance and Identification of Impediments to Closure Tool* can be largely addressed in a single comprehensive effort. ACEH anticipates requisite activities would include a search and submittal of overlooked site records and documents, a multiple pronged targeted site investigation, and a well survey and door-to-door canvas, and supply well sampling. This data would either support closure of the site under the LTCP or identify additional impediments to closure.

In accordance with the SWRCB's *Draft Plan for Implementation of Low-Threat UST Case Closure Policy and Additional Program Improvements*, ACEH recommends that a Path to Closure Plan be developed to include specific milestones and timelines for resolution of these impediments to closure and a goal date for closure.

Conclusions

The USTCF's evaluation fails to demonstrate that this site meets the criteria for the Low-Threat Closure Policy. As conducted, the USTCF's review conflicts with multiple technical resources, including the CA LUFT Manual which has been revised in part to provide support for the LTCP. The site has not been characterized to the extent required by the policy. While ACEH recognizes that the policy allows for exceptions, the preponderance of exceptions required for this site indicates that the review is insufficient. The recommended closure does not protect existing users of groundwater in the vicinity, may not protect a local creek and park, does not require maintenance of potentially existing engineering controls, and has not notified all appropriate interested parties of potential closure, including the current landowner, as required by regulations and policies. Consequently ACEH recommends that SWRCB not concur with closure at this time, the CSM be updated, that data gaps be addressed as identified in the attached ACEH *Low-Threat UST Case Closure Policy Compliance Checklist and Identification of Impediments to Case Closure Checklist,* a data gap work plan be prepared and submitted to ACEH for review and approval, and the work be conducted in order to progress the site towards closure under the LTCP.

Thank you for providing ACEH with the opportunity to comment on the subject site. Should you have any questions regarding the responses above, please contact me at (510) 567-6876 or send me an electronic mail message at mark.detterman@acgov.org.

Sincerely,

Digitally signed by Donna L. Drogos
DN: cn=Donna L. Drogos, o=Alameda County Environmental Health, ou, email=donna.drogos@acgov.org, c=US
Date: 2012.11.05 11:19:09 -08'00'

Donna L. Drogos, P.E.
Division Chief

Digitally signed by Mark E. Detterman
DN: cn=Mark E. Detterman, o, ou, email, c=US
Date: 2012.11.05 11:33:26 -08'00'

Mark E. Detterman, PG, CEG
Senior Hazardous Materials Specialist

Attachments:
Attachment 1 – Technical Reference Table
Attachment 2 – Well Construction Diagram
Attachment 3 – Well Construction Data Table
Attachment 4 – Well Gauging Data Sheet
Attachment 5 – City of Piedmont Site Drainage Photos
Attachment 6 – CRA Site Drainage Repair Photos (2 pages)
Attachment 7 – Public Notification Map and List of Owners and Tenants
Attachment 8 – ACEH LTCP and Impediment Identification Checklist

cc: Mr. John Randall, Chevron Products Co, 6101 Bollinger Canyon Road, #5244, San Ramon, CA 94583

Ms. Catalina Espino Devine, Chevron Environmental Management Co, 6101 Bollinger Canyon Road, San Ramon, CA; (sent via electronic mail to espino@chevron.com)

Nathan Lee, Conestoga-Rovers & Assoc., 5900 Hollis Street, Suite A, Emeryville, CA 94608 (sent via electronic mail to nlee@craworld.com)

Lisa Babcock, State Water Resources Control Board, Division of Financial Assistance, 1001 I Street, Sacramento, CA 95814; (Sent via E-mail to: LBabcock@waterboards.ca.gov)

Pat Cullen, State Water Resources Control Board, Division of Financial Assistance, 1001 I Street, Sacramento, CA 95814; (Sent via E-mail to: PCullen@waterboards.ca.gov)

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Mary Rose Cassa, San Francisco Regional Water Quality Control Board, 1515 Clay Street, Suite 1400, Oakland, CA 94612 (Sent via E-mail to: MCassa@waterboards.ca.gov)

Ariu Levi, (sent via electronic mail to ariu.levi@acgov.org)
Donna Drogos, (sent via electronic mail to donna.drogos@acgov.org)
Mark Detterman, (sent via electronic mail to mark.detterman@acgov.org)
Electronic File, GeoTracker

Technical References Table

TOPIC	KEY CONCEPT	QUOTATION	REFERENCE CITATION
Selection of Appropriate Screen Interval for LNAPL Detection	**Wells intended to monitor for LNAPL can have long (10 - 15 ft) well screens that MUST extend across the interface; shorter well screens are recommended as appropriate for depth specific sampling (see further below).**	For wells installed specifically to monitor the presence of LNAPLs, well screen length must be determined by the degree of water table fluctuation. ...the screen must be long enough to keep the water table within it during extreme highs as well as extreme lows, which means the...historical water-level data for the site or surrounding data [must be considered]. If the water table rises above the top of the screen, or falls below the bottom of the screen, it is not possible to use the well for LNAPL detection. Additionally, if a sediment sump is used on a well in which the bottom of the screen is above the water table, the sump may remain filled with water and the well may provide a false indication of the absence of LNAPL. Therefore, the well screen must be long enough to extend above the historical high (at least 3 feet), and below the historical low (at least 2 feet) and, if a sediment sump is used, it should have a drain hole to allow water to escape in the event the water level drops below the bottom of the screen. ...wells that are used for LNAPL detection, and in which LNAPLs are found, should not be used to collect groundwater samples for determination of dissolved-phase concentrations.	***Practical Handbook of Environmental Characterization and Groundwater Monitoring; David Nielson; 2006; 2nd ed.***
		(pg 643; paraphrasing) ... well screens that monitor groundwater quality at the top of the water table usually are 10 to 15 ft long, depending on anticipated long-term changes in groundwater elevation, and that some of the screen remains above the water table in the vadose zone. Wells with this design are used to monitor for the presence of LNAPLs (and well yield is sufficient to obtain a reliable water sample – e.g. is not a production well). This same paragraph also states that well screens (non-water table implied) are typically 5 to 10 ft in length because samples should come from specific depths (again because well yield is not the main objective).	***Groundwater & Wells; Robert J. Sterrett; 2007; 3rd ed. (The new Johnson Screen Book)***
		To avoid dilution, well screens should be kept to the minimum length appropriate for intercepting a contaminant plume, especially in a high-yielding aquifer. The screen length should generally not exceed 10 feet. If construction of a water table well is the objective, either for defining flow gradient or detecting the presence of floating non-aqueous phase liquid (NAPL), then a longer screen spanning the water table is acceptable, to account for NAPL's or seasonal water table fluctuations. The RP should not use screen lengths that create a conduit for contaminant transport across hydraulically separated geologic units.	***Monitoring Well Design and Construction for Hydrogeologic Characterization; CalEPA; July 1995***
		...the well screen must be designed to prevent clogging and intercept the water table at both high- and low-groundwater conditions....	***40 CFR Section 280.43(f) and Preamble***
		Section 8.2.7, Screen Length and Setting, pp 385 - 388, it states " To monitor the position of the water table or to detect the presence of LNAPLs, the screen must be set so that it intersects the water table. The screen must be long enough to intersect the water table over the range of annual fluctuation..." See Figure 8.6 for examples of screens set incorrectly and correctly.	***Contaminant Hydrogeology, C.W. Fetter; 2008, 2nd ed.***
The Absence of LNAPL in a Well	**LNAPL Myths (In-Well LNAPL Thickness Dilemmas)**	The absence of LNAPL in a monitoring well means that LNAPL is not present at that Location. *Not necessarily true* : The presence of LNAPL in a well in an LNAPL-affected area is highly dependent on the water table elevation, in relation to the LNAPL impacts, as well as many other factors relating to the characteristics of the LNAPL and soil. In an unconfined setting, in-well LNAPL thicknesses often vary inversely with water table elevation. Hence, an increase in water table elevation typically results in a decrease in in-well LNAPL thickness. Sometimes, during high water tables, the LNAPL becomes entirely submerged, and no LNAPL remains in the well. However, as the water table elevation decreases over time, the LNAPL reappears in the well. In a confined setting, in-well LNAPL thickness varies directly with potentiometric surface elevation. Hence, as the potentiometric surface elevation increases, in-well LNAPL thicknesses also tend to increase.	***Evaluating LNAPL Remedial Technologies for Achieving Project Goals; ITRC LNAPLs Team; December 2009; Appendix D***
		LNAPL showing up in a well(s) where it hasn't been detected in an extended period of time (months or years) suggests that the plume is migrating or that a new release has occurred. *Not necessarily true* : Water table elevations/fluctuations may precent LNAPL from appearing in a given well for months or years. The LNAPL has not necessarily moved away; it may simply be submerged and does not have the ability to displace water and flow into the well screen.	***Evaluating LNAPL Remedial Technologies for Achieving Project Goals; ITRC LNAPLs Team; December 2009; Appendix D***

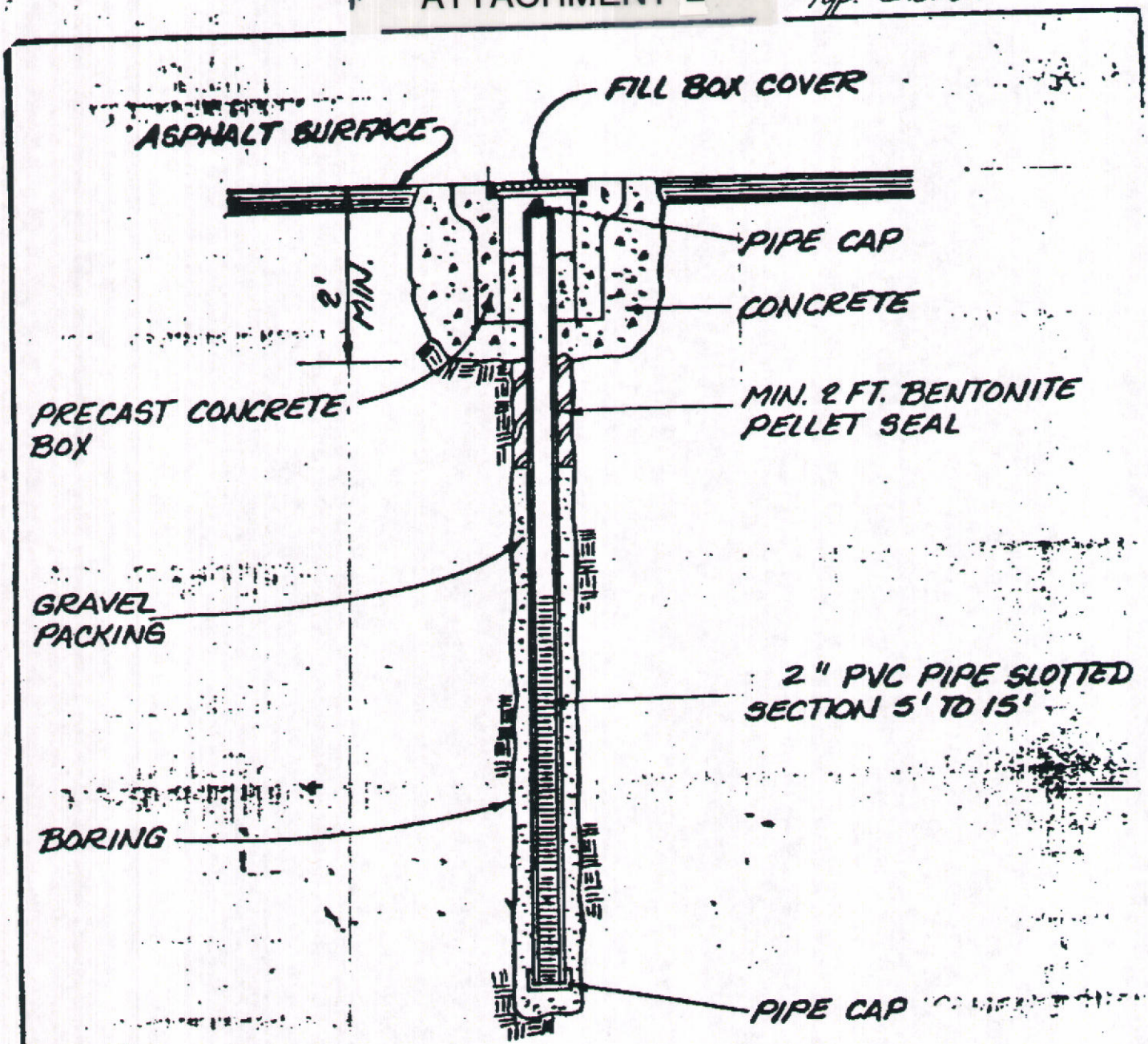
ATTACHMENT 1

Technical References Table

Contaminant Dilution	**Contaminant dilution is a factor of screen length**	If the objective of a monitoring program is to define the true nature and distribution of groundwater contamination and hydraulic heads at a site where complex geologic and hydraulic conditions and contaminant distribution patterns occur...multiple wells with short screens placed at close intervals, or multilevel monitoring systems are needed. Wells screens should generally be between 2 and 5 feet, rarely exceeding 10 feet in length. On the other hand if the objective of the well is to monitor for gross presence of contaminants in an aquifer, a longer screen might be selected. This type of well would provide both an integrated water sample and an integrated hydraulic head measurement, and would thus serve only as a screening tool.	***Groundwater & Wells; Robert J. Sterrett; 2007; 3rd ed. (The new Johnson Screen Book)***
		...concentration of chemical constituents in samples collected from wells are composited over the length of the screen, typically representing a weighted average of concentrations across the screen. Concentrations are normally skewed toward zones of highest hydraulic conductivity, which will yield more water to the well when it is purged and sampled. Because the highest hydraulic conductivity zones are the most important contaminant transport pathways, it may be rationalized that such samples are acceptable in terms of accurately representing conditions in the formation. However, significant dilution of samples, caused by screens penetrating zones in which contaminants may not be present (e.g., lower hydraulic conductivity zones) and by inappropriate purging and sampling practices (e.g., purging large volume of water prior to sampling) is bound to occur.....in fact concentrations in water table wells can vary by several orders of magnitude, depending on well screen placement and length.	***Groundwater & Wells; Robert J. Sterrett; 2007; 3rd ed. (The new Johnson Screen Book)***
		Seasonal variations in concentrations of dissolved-phase hydrocarbons can be extreme, because the vertical profiles of contamination below the water table essentially remain constant as the water table rises (when concentrations are typically more dilute) and falls (when concentrations are typically higher). Complicating this situation is the fact that in water table wells, samples represent a smaller interval of the saturated zone when the water table is lower, and a larger interval when the water table is higher. This makes accurate interpretation of sampling results, in terms of defining contaminant plumes, very difficult at best.	***Groundwater & Wells; Robert J. Sterrett; 2007; 3rd ed. (The new Johnson Screen Book)***
		...because of heterogeneities in geologic material that control contaminant transport, contaminant concentrations often vary by one to three orders of magnitude over vertical distances ranging from a few inches to a few feet.	***Groundwater & Wells; Robert J. Sterrett; 2007; 3rd ed. (The new Johnson Screen Book)***
		The length of the well screens in wells installed to define these conditions [groundwater chemistry, contaminant distribution, and hydraulic head] is the most important element in the success of a contaminant detection and monitoring program.	***Groundwater & Wells; Robert J. Sterrett; 2007; 3rd ed. (The new Johnson Screen Book)***
Conceptual Site Model	**The Official ASTM Definition: A CSM is not scattered**	ASTM Method 1689-95 describes development of an CSM. Section 1, Scope, states that this guide is intended to assist in the development of CSMs to be used for *integration* of technical information from various sources. Section 6.1, Assembling Information, under Procedure, calls for assembling information from numerous types of data. Per a dictionary "assembling" is an antonym for "scatter".	***ASTM 1689-95***
DTSC Vapor Guidance	**The State of the Practice - The collection of valid vapor data**	Quoting the DTSC Website: "DTSC's Vapor Intrusion Guidance provides a stepwise and sometimes iterative process for the investigation of vapor intrusion and describes procedures for screening and site-specific evaluation of potential risks associated with this exposure pathway. Indoor air concentrations estimated from soil gas or groundwater concentrations by fate and transport models for vapor intrusion and/or measured indoor air concentrations are used in the assessment. Models for estimating indoor air concentrations include default attenuation factors for vapor migration from soil gas or groundwater to indoor air, and default and site-specific inputs to the U.S. EPA version of the Johnson and Ettinger vapor intrusion model."	Final Guidance for the Evaluation & Mitigation of Subsurface Vapor Intrusion to Indoor Air (October 2011) http://www.dtsc.ca.gov/SiteCleanup/Vapor_Intrusion.cfm

ATTACHMENT 2

Typ. Detail



DEPTH OF HOLE: Varies

ATTACHMENT 3

Table 1 Well Construction Data, Former Chevron Station 9-0329, 340 Highland Avenue, Piedmont, California

Well	Top of Casing Elevation (ft msl)	Total Depth (ft)	Diameter (in)	Screen Interval (fbg)	Comments
C-1	Unknown	17.0	2	Unknown	This well was never sampled. It's status is unknown.
C-2	343.39	17.0	2	Unknown	Logs do not indicate screen interval
C-3	347.08	17.0	2	Unknown	Logs do not indicate screen interval
C-4	344.94	13.0	2	Unknown	Logs do not indicate screen interval
C-5	345.14	18.0	2	3-18	
C-6	338.61	17.5	2	2.5-17.5	
MW-6	Not Surveyed	20.0	2	5-20	Well abandoned

ft = feet
fbg = ft below grade
msl = mean sea level
in = inches

ATTACHMENT 4

WELL GAUGING DATA

Project # 120309-PC1 Date 3/9/12 Client Chevron

Site 340 Highland Ave, Piedmont

Well ID	Time	Well Size (in.)	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or ~~TOC~~	Notes
C-2	0835	2					0.90	11.12		
C-3	0800	2					1.42	13.30		
C-4	0752	2					2.42	9.72		
C-5	0845	2					2.45	17.00		
C-6	0915	2					0.72	17.31		
A	0808	6					1.37	8.13		
B	0816	6					3.60	9.00		

ATTACHMENT 5

340 Highland Ave.

1. Southern driveway showing continued seepage and pavement distortion.
2. Sewer drain inlet at end of driveway showing continued malfunctioning.
3. Small concrete patch of driveway at location of former barricades.

ATTACHMENT 6

CONESTOGA-ROVERS & ASSOCIATES

January 26, 2011 Reference No 311776

Repair of Grease Interceptor/Drain and Asphalt Paving

As shown in the photo below, it appears that the asphalt surrounding the interceptor drain has been repaired. CRA and Chevron have attempted to gather information related to the repair, but no one has replied to our inquiries. Chevron does not own this property or facility and is not able to control the repairs requested by the ACEH.

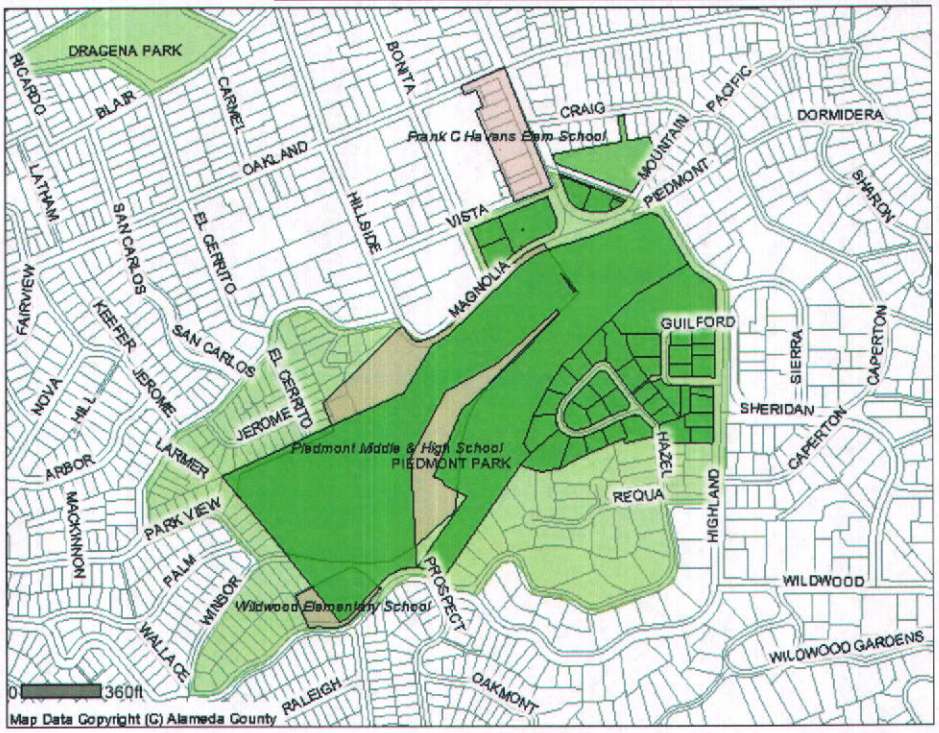
Utility Map

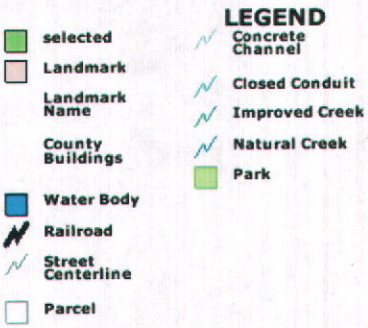
All utility locations and depths and diameters in the vicinity of the site are depicted on Figure 2. Based on CRA's site visit and Pacific Environmental Group's 1998 utility survey, the grease interceptor drain is connected to the sanitary sewer, not the storm water drains.[1] A sanitary

[1] Pacific Environmental Group, Inc., *Workplan for Groundwater Investigation* date September 9, 1998.

ATTACHMENT 7

RO269 Chevron #9-0329 Public Notification Map





Printed: 10/31/2012

BAINS TARVINDER TRUST
Parcel #: 50-4623-6-1
6111 TURNBERRY CT
DUBLIN CA 94568

BENSON JOHN E & DIANE C
Parcel #: 51-4676-36
140 HAZEL LN
PIEDMONT CA 94611

BERL STEVEN H & BLOCH
Parcel #: 51-4676-38
132 HAZEL LN
PIEDMONT CA 94611

BERLEKAMP ELWYN &
Parcel #: 51-4676-24-1
120 HAZEL LN
PIEDMONT CA 94611

BURGE R G & TERRI S
Parcel #: 51-4676-45
131 HAZEL LN
PIEDMONT CA 94611

CALVIN & JANE
Parcel #: 51-4676-3-1
777 HIGHLAND AVE
PIEDMONT CA 94611

CASTRO ROBERTO B &
Parcel #: 51-4676-5
137 GUILFORD RD
PIEDMONT CA 94611

CITY OF PIEDMONT
Parcel #: 50-4625-1-3
120 VISTA AVE
PIEDMONT CA 94611

CITY OF PIEDMONT
Parcel #: 51-4680-1-4
760 MAGNOLIA AVE
PIEDMONT CA 94611

CITY OF PIEDMONT
Parcel #: 51-4676-1
120 VISTA AVE
PIEDMONT CA 94611

CITY OF PIEDMONT
Parcel #: 50-4625-3-1
120 VISTA AVE
PIEDMONT CA 94611

CLARK FREDERIC H & NOLAN
Parcel #: 51-4676-25-1
114 HAZEL LN
PIEDMONT CA 94611

COLBY CHRISTOPHER P &
Parcel #: 51-4676-29
104 HAZEL LN
PIEDMONT CA 94611

COMBES GENEVIEVE &
Parcel #: 51-4676-31-3
160 HAZEL LN
PIEDMONT CA 94611

CORNELIUS JODY A TR
Parcel #: 51-4676-44
141 HAZEL LN
PIEDMONT CA 94611

CROWLEY THOMAS B JR &
Parcel #: 51-4676-43
151 HAZEL LN
OAKLAND CA 94611

DEUTSCHE RICHARD A &
Parcel #: 51-4676-41
121 HAZEL LN
PIEDMONT CA 94611

ESCOBOSA PAUL & LAURA
Parcel #: 51-4676-39
128 HAZEL LN
PIEDMONT CA 94611

GOLDMAN JAY M &
Parcel #: 51-4676-7
793 HIGHLAND AVE
PIEDMONT CA 94611

HOEFS WILLIAM F & M K TRS
Parcel #: 51-4676-32
156 HAZEL LN
PIEDMONT CA 94611

HOFFMAN INVESTMENT
Parcel #: 50-4623-6-2
1035 EDWARDS RD
BURLINGAME CA 94010

HOFFMAN INVESTMENT
Parcel #: 50-4623-5
1035 EDWARDS RD
BURLINGAME CA 94010

JEWELL NICHOLAS P &
Parcel #: 51-4676-28
108 HAZEL LN
PIEDMONT CA 94611

JOHN & ELIZABETH D
Parcel #: 51-4676-6
791 HIGHLAND AVE
PIEDMONT CA 94611

JOSEPH CATHERINE & TOM
Parcel #: 51-4676-20
124 GUILFORD RD
PIEDMONT CA 94611

KRUSI GEORGE S & BARBARA
Parcel #: 51-4676-42
111 HAZEL LN
PIEDMONT CA 94611

KWAN SIMON H & CHAN
Parcel #: 51-4676-40-2
124 HAZEL LN
PIEDMONT CA 94611

LEE CHARLES S & KIM YAERI
Parcel #: 50-4625-4
342 BONITA AVE
PIEDMONT CA 94611

MANOLIS PAUL G & ELENE Z
Parcel #: 51-4676-21
100 GUILFORD RD
PIEDMONT CA 94611

MULHOLLAND LESLIE D TR
Parcel #: 51-4676-19
132 GUILFORD RD
PIEDMONT CA 94611

NEWTON PAUL & DEBORAH K
Parcel #: 51-4676-17
131 GUILFORD RD
PIEDMONT CA 94611

RESIDENT
Parcel #: 51-4676-22
129 GUILFORD RD
PIEDMONT CA 94611

RESIDENT
Parcel #: 51-4676-1
711 HIGHLAND AVE
PIEDMONT CA 94611

RESIDENT
Parcel #: 50-4623-6-1
340 HIGHLAND AVE
PIEDMONT CA 94611

SEAVEY WILLIAM A & MARY
Parcel #: 51-4676-16
90 HAZEL LN
PIEDMONT CA 94611

STRAUCH ROGER A &
Parcel #: 51-4676-23
125 GUILFORD RD
PIEDMONT CA 94611

TAYLOR ROBERT O, ANN R &
Parcel #: 51-4676-34
152 HAZEL LN
PIEDMONT CA 94611

WIETELMANN ROLF T &
Parcel #: 51-4676-37
136 HAZEL LN
PIEDMONT CA 94611

NUGENT GEORGE J & DIANA
Parcel #: 51-4676-18
135 GUILFORD RD
PIEDMONT CA 94611

RESIDENT
Parcel #: 50-4623-6-2
356 HIGHLAND AVE
PIEDMONT CA 94611

RESIDENT
Parcel #: 51-4676-34
HAZEL LN
PIEDMONT CA 94610

RESIDENT
Parcel #: 50-4623-5
HIGHLAND AVE
PIEDMONT CA 94610

SHERRERD SUSAN M
Parcel #: 51-4676-35
144 HAZEL LN
PIEDMONT CA 94611

SULLIVAN WILLIAM J &
Parcel #: 51-4676-22
1530 LEIMERT BLVD
OAKLAND CA 94602

THEIS DAVID S & ROYCE
Parcel #: 51-4676-30
100 HAZEL LN
PIEDMONT CA 94611

PIEDMONT CHURCH CORP
Parcel #: 50-4623-4
400 HIGHLAND AVE
PIEDMONT CA 94611

RESIDENT
Parcel #: 51-4680-1-4
MAGNOLIA AVE
PIEDMONT CA 94611

RESIDENT
Parcel #: 50-4625-3-1
801 MAGNOLIA AVE
PIEDMONT CA 94611

SCHMIDT DAVID E & MARION
Parcel #: 51-4676-4-1
781 HIGHLAND AVE
PIEDMONT CA 94611

STOCK JOHN V & PEGGY M
Parcel #: 51-4676-2
50 GUILFORD RD
PIEDMONT CA 94611

TAYLOR ROBERT O, ANN R &
Parcel #: 51-4676-33
152 HAZEL LN
PIEDMONT CA 94611

VANDERBYL MICHAEL
Parcel #: 51-4676-8
795 HIGHLAND AVE
PIEDMONT CA 94611

LOW THREAT UST CASE CLOSURE POLICY COMPLIANCE AND IDENTIFICATION OF IMPEDIMENTS TO CASE CLOSURE CHECKLIST
ALAMEDA COUNTY ENVIRONMENTAL HEALTH LOCAL OVERSIGHT PROGRAM

Agency Name: Alameda County Environmental Health Local Oversight Program	Date: Nov. 2, 2012
Case Worker: Mark DeTerman	Fuel Leak Case No: RO0000269
Site Name: Chevron # 9-0329	GeoTracker Global ID: T0600101885
Site Address: 340 Highland Ave, Piedmont	USTCF Claim No: 6001

☐ PASS ☐ FAIL

The site does [complies/does not comply] with the requirements of the Low-Threat Underground Storage Tank Case Closure Policy (LTCP) as described below.

This site **[complies/does not comply]** with the State Water Resources Control Board (SWRCB) 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. The current conceptual site model based on information contained in the case file databases (Alameda County Environmental Health website and SWRCB GeoTracker website), is not adequate to determine that residual petroleum constituents at the site do not pose a significant risk to human health, safety, or the environment.

LTCP Introductory Statement

"The purpose of this policy is to establish consistent statewide case closure criteria for low-threat petroleum UST sites. The policy is consistent with existing statutes, regulations, State Water Board precedential decisions, policies and resolutions, and is intended to provide clear direction to responsible parties, their service providers, and regulatory agencies. The policy seeks to increase UST cleanup process efficiency. A benefit of improved efficiency is the preservation of limited resources for mitigation of releases posing a greater threat to human and environmental health.

This policy is a state policy for water quality control and applies to all petroleum UST sites subject to Chapter 6.7 of Division 20 of the Health and Safety Code and Chapter 16 of Division 3 of Title 23 of the California Code of Regulations. The term "regulatory agencies" in this policy means the State Water Board, Regional Water Quality Control Boards (Regional Water Boards) and local agencies authorized to implement Health and Safety Code section 25296.10. Unless expressly provided in this policy, the terms in this policy shall have the same definitions provided in Chapter 6.7 of Division 20 of the Health and Safety Code and Chapter 16 of Division 3 of Title 23 of the California Code of Regulations.

Criteria for Low-Threat Case Closure

In the absence of unique attributes of a case or site-specific conditions that demonstrably increase the risk associated with residual petroleum constituents, cases that meet the general and media-specific criteria described in this policy pose a low threat to human health, safety or the environment and are appropriate for closure pursuant to Health and Safety Code section 25296.10. Cases that meet the criteria in this policy do not require further corrective action and shall be issued a uniform closure letter consistent with Health and Safety Code section 25296.10. Annually, or at the request of the responsible party or party conducting the corrective action, the regulatory agency shall conduct a review to determine whether the site meets the criteria contained in this policy.

It is important to emphasize that the criteria described in this policy do not attempt to describe the conditions at all low-threat petroleum UST sites in the State. The regulatory agency shall issue a closure letter for a case that does not meet these criteria if the regulatory agency determines the site to be low-threat based upon a site specific analysis.

This policy recognizes that some petroleum-release sites may possess unique attributes and that some site specific conditions may make case closure under this policy inappropriate, despite the satisfaction of the stated criteria in this policy. It is impossible to completely capture those sets of attributes that may render a site ineligible for closure based on this low-threat policy. This policy relies on the regulatory

agency's use of the conceptual site model to identify the special attributes that would require specific attention prior to the application of low-threat criteria. In these cases, it is the regulatory agency's responsibility to identify the conditions that make closure under the policy inappropriate.

General Criteria

"General criteria that must be satisfied by all candidate sites are listed as follows:

a. The unauthorized release is located within the service area of a public water system;

b. The unauthorized release consists only of petroleum;

c. The unauthorized ("primary") release from the UST system has been stopped;

d. Free product has been removed to the maximum extent practicable;

e. A conceptual site model that assesses the nature, extent, and mobility of the release has been developed;

f. Secondary source has been removed to the extent practicable;

g. Soil or groundwater has been tested for methyl tert-butyl ether (MTBE) and results reported in accordance with Health and Safety Code section 25296.15; and

h. Nuisance as defined by Water Code section 13050 does not exist at the site."

Media-Specific Criteria

"Releases from USTs can impact human health and the environment through contact with any or all of the following contaminated media: groundwater, surface water, soil, and soil vapor. Although this contact can occur through ingestion, dermal contact, or inhalation of the various media, the most common drivers of health risk are ingestion of groundwater from drinking water wells, inhalation of vapors accumulated in buildings, contact with near surface contaminated soil, and inhalation of vapors in the outdoor environment. To simplify implementation, these media and pathways have been evaluated and the most common exposure scenarios have been combined into three media-specific criteria:

1. Groundwater

2. Vapor Intrusion to Indoor Air

3. Direct Contact and Outdoor Air Exposure

Candidate sites must satisfy all three of these media-specific criteria as described below."

LOW THREAT UST CASE CLOSURE POLICY COMPLIANCE AND IDENTIFICATION OF IMPEDIMENTS TO CASE CLOSURE CHECKLIST
ALAMEDA COUNTY ENVIRONMENTAL HEALTH LOCAL OVERSIGHT PROGRAM

CHECKLIST KEY:

☐ UND = Undetermined of Unknown ☐ NE = Not evaluated ☐ NA = Not applicable

General Criteria a: Is the unauthorized release located within the service area of a public water system? ☑ Yes ☐ No ☐ UND

LTCP Statement: "This policy is protective of existing water supply wells. New water supply wells are unlikely to be installed in the shallow groundwater near former UST release sites. However, it is difficult to predict, on a statewide basis, where new wells will be installed, particularly in rural areas that are undergoing new development. This policy is limited to areas with available public water systems to reduce the likelihood that new wells in developing areas will be inadvertently impacted by residual petroleum in groundwater. Case closure outside of areas with a public water system should be evaluated based upon the fundamental principles in this policy and a site specific evaluation of developing water supplies in the area. For purposes of this policy, a public water system is a system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year."

CA LUFT Manual Guidance Statement:

Approaches for evaluation of sites outside a public water supply system. "These sites should be evaluated based upon the fundamental principles in this policy and a site-specific evaluation of developing water supplies in the area. The following list includes additional characteristics to consider that might result in a low-threat designation even for a site outside a public water supply:

- Impacted groundwater that is shallower than the sanitary seal requirement for supply wells in the applicable county.
- Impacted perched water zones are not a viable potential water supply
- High salinity or low yield that negate the impacted groundwater from drinking water beneficial use per State Water Board Resolution 1988-0063, or de-designated areas in various Basin Plans.
- Groundwater plumes where WQOs will be attained through natural attenuation within a reasonable time, prior to the expected need for use of any affected groundwater."

Name of public water system:

☑ East Bay Municipal Utility District ☐ Zone 7 ☐ Hayward Water

Has pertinent information been provided in the CSM for compliance evaluation? (refer to General Criteria e for specific information) ☐ Yes ☑ No ☐ UND

End of General Criteria a Evaluation

General Criteria b: Does the unauthorized release consist only of petroleum? ☐ Yes ☐ No ☑ UND

LTCP Statement: "For purposes of this policy, petroleum is defined as crude oil, or any fraction thereof, which is liquid at standard conditions and temperature and pressure, which means 60 degrees Fahrenheit and 14.7 pounds per square inch absolute including the following substances: motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents and used oils, including any additives and blending agents such as oxygenates contained in the formulation of the substances."

CA LUFT Manual Guidance Statement:

Approaches for evaluation sites with petroleum releases that are not from a UST system. "This policy may still be used to evaluate whether a petroleum-only site that is not associated with USTs is low-threat as long as the exposure assumptions are equivalent to those in this policy, or are shown to be low-threat by a site-specific analysis. For example, site with petroleum releases form natural gas/oil field operations, pipelines, or aboveground storage tanks (ASTs) may be evaluated using this policy as long as these sites meet all of the criteria and the impacted soil is less than 82 feet by 82 feet in areal extent (to meet the direct contact CSM), or a site-specific risk assessment shows that the impacted soil is low-risk for direct contact pathway."

Approaches for evaluation of sites with crude oil releases. "Although this policy was developed for fuel releases, crude oil releases could also be evaluated using this policy, as long as data for BTEX, naphthalene, and PAHs have been collected. This is because the carbon range for crude oil overlaps the combined carbon ranges for gasoline, diesel, and bunker fuel."

Approaches for sites containing non-petroleum chemicals (e.g., solvents) in soil. "These sites should be evaluated using a traditional risk assessment. Risk can be evaluated in several ways, but is often evaluated using a tiered approach in which the complexity of the evaluation increases with each tier (or step) in the process."

Has pertinent information been provided in the CSM for compliance evaluation? (refer to General Criteria e for specific information) ☐ Yes ☑ No ☐ UND

End of General Criteria b Evaluation

General Criteria c: Has the unauthorized ("primary") release from the UST system been stopped?	☑ Yes ☐ No ☐ UND

LTCP Statement: "The tank, pipe, or other appurtenant structure that released petroleum into the environment (i.e. the primary source) has been removed, repaired or replaced. It is not the intent of this policy to allow sites with ongoing leaks from the UST system to qualify for low-threat closure."

CA LUFT Manual Guidance Statement:

Has pertinent information been provided in the CSM for compliance evaluation? (refer to General Criteria e for specific information) ☑ **Yes** ☐ **No** ☐ **UND**

End of General Criteria c Evaluation Section

General Criteria d: Has free product been removed to the maximum extent practicable?

☐ Yes ☐ No ☑ UND
☐ FP Not Encountered

LTCP Statement: "At petroleum unauthorized release sites where investigations indicate the presence of free product, free product shall be removed to the maximum extent practicable. In meeting the requirements of this section:

(a) Free product shall be removed in a manner that minimizes the spread of the unauthorized release into previously uncontaminated zones by using recovery and disposal techniques appropriate to the hydrogeologic conditions at the site, and that properly treats, discharges or disposes of recovery byproducts in compliance with applicable laws;

(b) Abatement of free product migration shall be used as a minimum objective for the design of any free product removal system; and

(c) Flammable products shall be stored for disposal in a safe and competent manner to prevent fires or explosions."

CA LUFT Manual Guidance Statement:

Has pertinent information been provided in the CSM for compliance evaluation? (refer to General Criteria e for specific information) ☐ Yes ☑ No ☐ UND

End of General Criteria d Evaluation

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? ☐ Yes ☑ No ☐ UND

LTCP Statement: "The Conceptual Site Model (CSM) is a fundamental element of a comprehensive site investigation. The CSM establishes the source and attributes of the unauthorized release, describes all affected media (including soil, groundwater, and soil vapor as appropriate), describes local geology, hydrogeology and other physical site characteristics that affect contaminant environmental transport and fate, and identifies all confirmed and potential contaminant receptors (including water supply wells, surface water bodies, structures and their inhabitants). The CSM is relied upon by practitioners as a guide for investigative design and data collection. Petroleum release sites in California occur in a wide variety of hydrogeologic settings. As a result, contaminant fate and transport and mechanisms by which receptors may be impacted by contaminants vary greatly from location to location. Therefore, the CSM is unique to each individual release site. All relevant site characteristics identified by the CSM shall be assessed and supported by data so that the nature, extent and mobility of the release have been established to determine conformance with applicable criteria in this policy. The 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."

CA LUFT Manual Guidance Statement:
"The objectives of a CSM are:

- To convey an understanding of the origin, nature, and lateral and vertical extent of contamination.
- To identify potential contaminant fate-and-transport processes and pathways. See the Fate and Transport chapter for further details.
- To identify potential human and environmental receptors that may be impacted by contamination associated with the site.
- To guide site investigation activities and identify additional data needed (if any) to draw reasonable conclusions regarding the source(s), pathways, and receptors.
- To frame the evaluation of risk to human health, safety, and the environment posed by releases at a LUFT site.

The objectives emphasize the need for an approach where a CSM is developed early and is iteratively refined through the project life cycle. Each piece of data that is collected should serve to refine the CSM. The Interstate Technology & Regulator Council (ITRC) Vapor Intrusion Pathway Guidance document (ITRC 2007) provides additional information on developing a CSM."

Has a CSM that adequately assesses the nature, extent and mobility of the release in affected media at in the vicinity of the site been developed? ☐ Yes ☑ No ☐ UND ☐ NE ☐ NA

Groundwater Assessment	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Surface Water Assessment	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Soil Assessment	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Soil Vapor Assessment	☐ Yes ☐ No ☑ UND ☐ NE ☐ NA
Indoor Air Assessment	☐ Yes ☐ No ☐ UND ☑ NE ☐ NA
Potential Receptors Identified	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Exposure Pathways Identified	☐ Yes ☐ No ☑ UND ☐ NE ☐ NA
Hydrogeology Defined	☐ Yes ☐ No ☑ UND ☐ NE ☐ NA
Contaminant Transport Assessment	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Source(s) Defined	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA

(General Criteria e evaluation continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued) — ☐ Yes ☑ No ☐ UND

Has the CSM been developed in accordance with industry standards? ☐ Yes ☑ No ☐ UND ☐ NE ☐ NA

SWRCB CA LUFT Manual, September 2012	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
ITRC Vapor Intrusion Pathway Guidance document (ITRC 2007)	☐ Yes ☐ No ☑ UND ☐ NE ☐ NA
ASTM Method 1689-95 - Standard Guide for Developing Conceptual Site Models for Contaminated Sites	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
ASTM Method 2531-6 - Standard Guide for Development of Conceptual Models for Light Nonaqueous-Phase Liquids Released to the Subsurface	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
DTSC Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (October 2011)	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA

Is the CSM presented in one comprehensive document? ☐ Yes ☑ No ☐ UND ☐ NE ☐ NA

If no, then has a summary document been submitted that identifies the documents where the requisite CSM elements are located?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA

Is the CSM current? ☐ Yes ☑ No ☐ UND ☐ NE ☐ NA

Is the CSM representative of current site conditions?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Does the final closure review validate the CSM?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA

Have the requisite components of the CSM been submitted? ☐ Yes ☐ No ☑ UND ☐ NE ☐ NA

Hydrogeologic Setting Evaluation	☐ Yes ☐ No ☑ UND ☐ NE ☐ NA
Source Evaluation	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Contaminant Transport and Exposure Pathways Evaluation	☐ Yes ☐ No ☑ UND ☐ NE ☐ NA
Receptors Evaluation	☐ Yes ☐ No ☑ UND ☐ NE ☐ NA
Have data gaps been identified that require further investigation during subsequent phases of work?	☑ Yes ☐ No ☐ UND ☐ NE ☐ NA

(General Criteria e evaluation continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Has the Hydrogeologic Setting Been Adequately Evaluated?	☐ Yes ☑ No ☐ UND

CA LUFT Manual Guidance Statement:

Hydrogeologic Setting – "The hydrogeology (geologic factors that affect groundwater flow) of a site generally controls contaminant migration. Gaining an understanding of the geologic setting will also help to determine the pathways of migration. Much of the geologic information for a LUFT site can be gathered from historical reports, state and federal environmental databases (including boring logs obtained from cases in the GeoTracker database), and electronic and paper files covering the site and adjacent properties from various federal, state, and local agencies. Geologic aspects to consider when conceptualizing the geology at a LUFT site include:

- Site topography.
- Regional and local geologic conditions, including key aquifer and aquitard units.
- Site-specific soil texture/lithology (e.g., identify the predominant types of soil at the site, such as clay, sand, gravel, fractured bedrock, sediments, etc.), stratigraphy, and structures (dipping strata, faults, etc.) that may affect contaminant transport.

An understanding of the regional hydrogeology is also important in developing the CSM, especially if groundwater could potentially become impacted or is already impacted. Hydrogeologic features to be considered when developing the CSM include:

- Depth to the water table and its seasonal and known historical fluctuation.
- Groundwater flow within the shallowest aquifer (gradient direction, hydraulic conductivity, flow velocity), vertical gradient and degree of interconnection between unconfined, semi-confined, and confined groundwater.
- Whether or not the source is beneath a low-permeability surface (such as asphalt or concrete).
- Designated beneficial uses of groundwater beneath the site.
- Location of proximal supply wells that may influence groundwater flow or be potential receptors.
- Location of nearby surface-water bodies (if any) and potential transport pathways to surface-water bodies."

A description of the monitoring well network at the site for collecting soil gas and groundwater data?	**GW:** ☑ **Yes** ☐ **No** ☐ **UND** ☐ **NE** ☐ **NA** **SG:** ☐ **Yes** ☐ **No** ☐ **UND** ☑ **NE** ☐ **NA**
Summary table listing all wells in the monitoring network and providing construction details including date installed, screen intervals, screen length, formations screened, type of wellhead (i.e., flush-mounted or stove top), date of last well development, and date of last survey and survey datum?	GW: ☑ Yes ☐ No ☐ UND ☐ NE ☐ NA SG: ☐ Yes ☐ No ☐ UND ☑ NE ☐ NA
An analysis of the quality and validity of data obtained by the monitoring well network including the appropriateness of field sampling protocols and use of appropriate laboratory reporting limits?	GW: ☐ Yes ☑ No ☐ UND ☐ NE ☐ NA SG: ☐ Yes ☐ No ☐ UND ☑ NE ☐ NA
Identification of submerged/dry well conditions and an analysis of the effects on sample bias due to dilution and ability to detect free product?	GW: ☐ Yes ☑ No ☐ UND ☐ NE ☐ NA SG: ☐ Yes ☐ No ☐ UND ☑ NE ☐ NA
Monitoring well construction logs?	GW: ☑ Yes ☐ No ☐ UND ☐ NE ☐ NA SG: ☐ Yes ☐ No ☐ UND ☑ NE ☐ NA

(Hydrogeologic Setting Evaluation continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Has the Hydrogeologic Setting Been Adequately Evaluated? (continued)	☐ Yes ☑ No ☐ UND

Analysis of anomalous water-level data?	☐ **Yes** ☑ **No** ☐ **UND** ☐ **NE** ☐ **NA**
Analysis of contours on a site plan showing groundwater elevations which do not make sense?	☐ **Yes** ☐ **No** ☐ **UND** ☐ **NE** ☐ **NA**
Analysis of operator error?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Inclusion of water-level elevations in nearby wells which are not consistent and from which there cannot be calculated any obvious flow direction or gradient?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Contouring water-level elevations using data obtained from multiple aquifers (perched, water table, confined)?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Contouring water-level elevations using data obtained from aquifers with larger vertical upward or downward gradients?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Collecting water-level data before wells have had time to equilibrate after opening the well cap?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Failing to measure depths to water with sufficient speed in areas with significant tidal influences?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Using measurements from wells which have filled with sediment or have become plugged in some manner?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Computer-generated contour maps that have not allowed for professional geologic interpretation of site specific features?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Analysis of hydrogeologic site conditions causing error?	☐ **Yes** ☑ **No** ☐ **UND** ☐ **NE** ☐ **NA**
Abrupt changes in stratigraphy across a site, such as a stream channel meandering with coarse material adjacent to and interlaced with fine-grained material?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Pods of low-permeability material creating a semi-confined condition in an otherwise water-table (unconfined) aquifer that cause water-level elevation to not track evenly across the site?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Wells located next to buried utilities where well perforations have hydraulic continuity with the utility backfill?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Wells located near and in continuity with a former or current UST pit resulting in anomalous high or low water levels?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Perched water zone on a portion of a site?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Wells perforated across two or more water-bearing zones with different hydraulic heads?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Well measurements taken immediately after a major rainfall event and before the aquifer system has time to equilibrate?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

(Hydrogeologic Setting Evaluation continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Has the Hydrogeologic Setting Been Adequately Evaluated? (continued)	☐ Yes ☑ No ☐ UND

Analysis of anomalous water-level data? (continued) ☐ Yes ☑ No ☐ UND ☐ NE ☐ NA

Analysis of consistent data points?

Depth-to-water-level measurements in a monitoring well or wells that is always the same, or varies very little when other wells at a site show variance, signaling that water levels have fallen below the screened interval of the monitoring well and that only residual water in the well's end cap is being measured.	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Have water level measurements been compared with the known total depth of the well, or has the bottom of the well been measured and compared to the water-level results.	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

Analysis of anomalous gradients?

Data from adjacent or nearby sites differs significantly from what the site data?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Have wells casings been cut?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Have well casings sank due to high traffic in the area?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Have well casings been accurately surveyed for top-of-casing elevations?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

Interpretation of Data

A statement about data validation	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Conformance with quality assurance/quality control (QA/QC) limits	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Conformance with data quality objectives (DQOs)	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
If DQOs have not been met than a statement regarding whether the data are still valid and useable, and the underlying rationale for the conclusion	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

Analysis of the hydraulic flow system in the vicinity of the site? ☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

Rose diagrams which depict groundwater flow direction on groundwater elevation contour maps?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
An evaluation of changes in hydraulic flow system due to seasonal precipitation and groundwater pumping	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
An evaluation for potential interconnection between shallow and deep aquifers	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
An analysis of vertical hydraulic gradients, and effects of pumping rates on hydraulic head from nearby water supply wells	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Cross sections depicting the piezometric surface in different water bearing zones	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Hydrographs of all monitoring wells	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

(Hydrogeologic Setting Evaluation continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Has the Hydrogeologic Setting Been Adequately Evaluated? (continued)	☐ Yes ☑ No ☐ UND

Plume (soil gas and groundwater) development and dynamics? ☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

Evaluation of aging of source(s)	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Evaluation of phase distribution (NAPL, dissolved, vapor, residual)	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Evaluation of diving plumes	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Evaluation of attenuation mechanisms	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Evaluation of migration routes	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Presentation of magnitude of COCs	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Evaluation of spatial and temporal changes in concentrations	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Two-dimensional plan view maps of the source distribution and of groundwater and soil vapor plumes depicting the contaminant distribution of each COC	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Cross sections depicting the vertical delineation of groundwater plumes and source distribution	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Summary tables of chemical concentrations in different media (i.e., soil, groundwater, and soil vapor)?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Environmental screening levels on all tables	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Graphs of contaminant concentrations versus time	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Current and historic facility structures (e.g., buildings, drain systems, sewer systems, underground utilities, etc.) and physical features including topographical features (e.g., hills, gradients, surface vegetation, or pavement) and surface water features (e.g. routes of drainage ditches, links to water bodies).	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Current site maps	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Current and historic site operations/ (e.g., parts cleaning, chemical storage areas, manufacturing, etc.)?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Historic site maps	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Other contaminant release sites in the vicinity of the site?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Summary of work and technical findings from nearby release sites?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

End of Hydrogeologic Setting Evaluation section

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Has the Source(s) Been Adequately Evaluated?	☐ Yes ☑ No ☐ UND

CA LUFT Manual Guidance Statement:

Source – "A "source" is/are the environmental medium/media containing elevated contaminant concentrations associated with a release. Some risk-based corrective action (RBCA) programs define the source to be the original cause of the contamination; however, it is possible that, by the time a site becomes a LUFT site, the original source has been eliminated and the current source of contamination is soil and/or groundwater. Items to consider when determining the source are included in the list below. Some of the specifics may be determined based on historical information; others will need to be determined during site assessment.

- The origin(s) of the release (e.g., a leaking UST, dispenser, product piping, and/or surface spill).
- The number of USTs, the capacity of the tanks (e.g., 12,000 gallons), the products stored, the date of installation, and the removal date(s) (if applicable).
- The location of historical and active USTs, dispensers, and product piping.
- Details about the specific release location(s) (e.g., spill locations and time frame/dates if known).
- The type of fuel released and the constituents of concern (COCs) associated with the fuel. The Fate and Transport chapter of this Manual presents guidance on identifying potential COCs associated with fuel.
- The historical use of fuel additives (e.g., methyl tertiary butyl ether [MTBE] or other fuel oxygenates, lead, lead scavengers).
- The media that are impacted (e.g., soil, groundwater).
- Other potential sources such as surface spills, aboveground storage tank (AST) leakage, or pipeline leakage.

The information needed to define the source—to be obtained during the site assessment—includes the following:

- Lateral and vertical extent of:
  - light non-aqueous-phase liquid (LNAPL)
  - COCs in unsaturated-zone soil
  - COCs in saturated-zone soil and the smear zone
  - COCs in groundwater
- The distribution of the COCs in the impacted media.

After evaluating the information obtained during site characterization, the extent and magnitude of the contamination can be defined. This is not an exact science; usually some assumptions will need to be made. In these cases, it is important, from a risk-evaluation perspective, to be conservative."

Free Product Evaluation

Has the presence of free product been evaluated?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Has a preferential pathway study been conducted to determine the probability of free product encountering geologic and anthropogenic preferential pathways and conduits that can act as contaminant migration pathways to or from the site?	☐ Yes ☐ No ☐ UND ☑ NE ☐ NA
Is monitoring well construction adequate to detect the presence of free product?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA

(Free product evaluation section continued on next page)

(Source Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Has the Source(s) Been Adequately Evaluated? (continued)	☐ Yes ☐ No ☐ UND

Free Product Evaluation (continued)

Has free product removal been implemented?	☐ Yes ☐ No ☐ UND ☑ NE ☐ NA
If yes, removal method tried? ☐ Absorbent Materials ☐ Bailing ☐ Skimmer ☐ HVDPE ☐ Other	
Is free product removal still being conducted?	☐ Yes ☐ No ☐ **UND** ☐ NE ☐ NA
Does data indicate rebound of free product subsequent to product removal?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

Has MTBE soil and groundwater contamination been adequately characterized?	
Sufficient data including tables and figures to assess whether MTBE is or was present in soil at the site	☐ Yes ☐ No ☐ UND ☑ NE ☐ NA
Sufficient data including tables and figures to assess whether MTBE is or was present in groundwater at the site	☐ Yes ☐ No ☐ UND ☑ NE ☐ NA

Has Pertinent Information Been Provided?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Description of investigation and monitoring activities that have been undertaken to assess whether free product is present?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Data including tables and figures showing any observation and measurements of free product?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Preferential pathway study results and conclusions?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Description of corrective action(s) that were taken to remove product, dates of removal actions, and volumes removed?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
An evaluation of whether free product removal is practicable, or if not practicable, a description of the conditions that prevent free product removal?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Discussion for monitoring well network and appropriateness of screen interval to detect free product?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Tabulation and evaluation of historic groundwater levels and flow direction and identification of smear zone?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

(Source Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued) — ☐ Yes ☑ No ☐ UND

Has the Source(s) Been Adequately Evaluated? (continued) — ☐ Yes ☑ No ☐ UND

Has groundwater contamination been fully characterized? ☐ Yes ☑ No ☐ UND ☐ NE ☐ NA

Have petroleum hydrocarbons been detected in groundwater? ☑ Yes ☐ No ☐ UND ☐ NE ☐ NA

Motor Fuels: ☑ Yes ☐ No ☐ NE ☐ NA	☐ Leaded Gasoline ☐ Unleaded Gasoline	☑ Undifferentiated
TPH Middle Distillates: ☑ Yes ☐ No ☐ NE ☐ NA	☑ Diesel ☐ Stoddard Solvent ☐ Jet Fuel	☐ Kerosene ☐ Home Heating Fuel ☐ Others
Residual Fuels: ☐ Yes ☐ No ☑ NE ☐ NA	☐ Bunker C ☐ Waste Oils ☐ Hydraulic Oil	☐ Lubricating Oil ☐ Oil and Grease ☐ Others
Fuel Oxygenates: ☑ Yes ☐ No ☐ NE ☐ NA	☐ MTBE ☐ ETBE ☐ TAME	☐ TBA ☐ DIPE ☐ Others
Lead Scavengers: ☑ Yes ☐ No ☐ NE ☐ NA	☐ EDB ☐ EDC	
Aromatic Compounds: ☑ Yes ☐ No ☐ NE ☐ NA	☐ Benzene ☐ Toluene ☐ Ethylbenzene	☐ Xylenes ☐ Others
PAHs: ☐ Yes ☐ No ☑ NE ☐ NA	☐ Naphthalene ☐ Others	

Have other contaminants been detected in in groundwater? ☐ Yes ☐ No ☐ UND ☑ NE ☐ NA

VOCs: ☐ Yes ☐ No ☑ NE ☐ NA	☐ PCE ☐ TCE ☐ VC	☐ Chloroform ☐ Chlorobenzene ☐ Others
SVOCs: ☐ Yes ☐ No ☑ NE ☐ NA	List:	
Dioxans & Furans: ☐ Yes ☐ No ☑ NE ☐ NA	List:	
Other PAHs: ☐ Yes ☐ No ☑ NE ☐ NA	☐ Creosote ☐ PNAs	
PCBs: ☐ Yes ☐ No ☑ NA ☐ NE	List:	
Phenols: ☐ Yes ☐ No ☑ NE ☐ NA	☐ Phenol ☐ Others	
Metals: ☐ Yes ☐ No ☑ NE ☐ NA	☐ Lead ☐ Cadmium ☐ Chromium	☐ Zinc ☐ Nickel ☐ Other
Organo Chlorine Herbicides and Pesticides: ☐ Yes ☐ No ☐ NE ☑ NA	List:	

(Source Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued) — ☐ Yes ☑ No ☐ UND

Has the Source(s) Been Adequately Evaluated? (continued) — ☐ Yes ☐ No ☐ UND

Has soil contamination been fully characterized? ☐ Yes ☑ No ☐ UND ☐ NE ☐ NA

Have petroleum hydrocarbons been detected in soil? ☑ Yes ☐ No ☐ UND ☐ NE ☐ NA

Motor Fuels: ☑ Yes ☐ No ☐ NE ☐ NA	☐ Leaded Gasoline ☐ Unleaded Gasoline	☐ Undifferentiated
TPH Middle Distillates: ☐ Yes ☐ No ☑ NE ☐ NA	☐ Diesel ☐ Stoddard Solvent ☐ Jet Fuel	☐ Kerosene ☐ Home Heating Fuel ☐ Others
Residual Fuels: ☑ Yes ☐ No ☐ NE ☐ NA	☐ Bunker C ☐ Waste Oils ☐ Hydraulic Oil	☐ Lubricating Oil ☐ Oil and Grease ☐ Others
Fuel Oxygenates: ☐ Yes ☐ No ☐ NE ☐ NA	☐ MTBE ☐ ETBE ☐ TAME	☐ TBA ☐ DIPE ☐ Others
Lead Scavengers: ☐ Yes ☐ No ☐ NE ☐ NA	☐ EDB ☐ EDC	
Aromatic Compounds: ☑ Yes ☐ No ☐ NE ☐ NA	☐ Benzene ☐ Toluene ☐ Ethylbenzene	☐ Xylenes ☐ Others
PAHs: ☐ Yes ☐ No ☑ NE ☐ NA	☐ Naphthalene ☐ Others	

Have other contaminants been detected in soil? ☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

VOCs: ☐ Yes ☐ No ☑ NE ☐ NA	☐ PCE ☐ TCE ☐ VC	☐ Chloroform ☐ Chlorobenzene ☐ Others
SVOCs: ☐ Yes ☐ No ☑ NE ☐ NA	List:	
Dioxans & Furans: ☐ Yes ☐ No ☑ NE ☐ NA	List:	
Other PAHs: ☐ Yes ☐ No ☑ NE ☐ NA	☐ Creosote ☐ PNAs	
PCBs: ☐ Yes ☐ No ☐ NA ☑ NE	List:	
Phenols: ☐ Yes ☐ No ☑ NE ☐ NA	☐ Phenol ☐ Others	
Metals: ☐ Yes ☐ No ☑ NE ☐ NA	☐ Lead ☐ Cadmium ☐ Chromium	☐ Zinc ☐ Nickel ☐ Other
Organo Chlorine Herbicides and Pesticides: ☐ Yes ☐ No ☐ NE ☑ NA	List:	

(Source Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Has the Source(s) Been Adequately Evaluated? (continued)	☐ Yes ☑ No ☐ UND

Have the tank(s), piping, dispenser islands, or other appurtenant structures that released petroleum into the environment been removed, repaired or replaced? ☑ Yes ☐ No ☐ UND ☐ NE ☐ NA

Tanks	☑ Removed	☐ Repaired	☐ Replaced	☐ NA
Piping	☐ Removed	☐ Repaired	☐ Replaced	☐ NA
Dispenser Islands	☐ Removed	☐ Repaired	☐ Replaced	☐ NA
Other Structures	☐ Removed	☐ Repaired	☐ Replaced	☐ NA

Were/are the tanks permitted by a local regulatory agency having jurisdiction over USTs? ☑ Yes ☐ No ☐ UND ☐ NE ☐ NA

Have the operating records been reviewed (i.e., operating permit, types of products dispensed, tanks construction, tank capacity, tank tightness tests, etc)?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

Have the USTs been properly decommissioned ☑ Yes ☐ No ☐ UND ☐ NE ☐ NA

Was a tank removal permit issued by the local regulatory agency?	☑ Yes ☐ No ☐ UND ☐ NE ☐ NA
Was a tank removal report submitted and reviewed?	☑ Yes ☐ No ☐ UND ☐ NE ☐ NA

Were confirmation soil samples collected to confirm the presence or absence of an unauthorized release? ☑ Yes ☑ No ☐ UND ☐ NE ☐ NA

Were confirmation soil samples collected from the tank pit?	☑ Yes ☐ No ☐ UND ☐ NE ☐ NA
Were confirmation soil samples collected from beneath the tank piping?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Were confirmation soil samples collected from beneath the dispensers?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Were the confirmation soil samples collected in accordance with the recommendations presented in the CA LUFT Manual (Tables 12-1 and 12-2)	☑ Yes ☑ No ☐ UND ☐ NE ☐ NA
Were the confirmation soil samples analyzed for the recommended minimum verification analysis for USTs (Tri Regional, October 10, 2006)?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA

Was groundwater encountered in the excavation? ☑ Yes ☐ No ☐ UND ☐ NE ☐ NA

Was the tank pit purged and allowed to refill before sampling?	☐ Yes ☐ No ☑ UND ☐ NE ☐ NA
Was impacted groundwater extracted from the pit?	☐ Yes ☐ No ☑ UND ☐ NE ☐ NA
Were groundwater samples collected in accordance with the recommendations presented in the CA LUFT Manual?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Were the results evaluated for potentially negative bias in detected COCs due to aeration during excavation activities, or positive bias in detected COCs due to turbidity, sheen and product globules?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

(Source Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Has the Source(s) Been Adequately Evaluated? (continued)	☐ Yes ☑ No ☐ UND

Have the tank(s), piping, dispenser islands, or other appurtenant structures that released petroleum into the environment been removed, repaired or replaced? (continued) ☑ Yes ☐ No ☐ UND ☐ NE ☐ NA

Was stockpiled soil characterized and disposed of properly? ☐ Yes ☐ No ☑ NE ☐ NA

Were confirmation samples collected in accordance with the CA LUFT Manual? (i.e., one sample per 100 cubic yards of soil linearly and between 2 and 4 feet below the surface of the stockpile)?	☐ Yes ☐ No ☐ UND ☑ NE ☐ NA
Was the stockpiled soil disposed of at an off-site permitted disposal site?	☐ Yes ☐ No ☐ UND ☑ NE ☐ NA
Was the stockpiled soil used as backfill in the tank pit?	☐ Yes ☐ No ☐ UND ☑ NE ☐ NA
Was the stockpiled soil treated on-site?	☐ Yes ☐ No ☐ UND ☑ NE ☐ NA
Was the stockpiled soil characterized and reused on site in accordance with the technical reference document entitled Characterization and Reuse of Petroleum Hydrocarbon Impacted Soil and Inert Waste (RWQCB, October 2006)?	☐ Yes ☐ No ☐ UND ☑ NE ☐ NA

Was the tank pit and piping trench excavations backfilled with imported material? ☐ Yes ☐ No ☐ UND ☑ NE ☐ NA

Was the former tank pit backfilled with clean material with physical properties similar to the native material?	☐ Yes ☐ No ☐ UND ☑ NE ☐ NA
Was the former tank pit backfilled with clean material in accordance with the DTSC Information Advisory for Clean Imported Fill Material?	☐ Yes ☐ No ☐ UND ☑ NE ☐ NA
Is their evidence that a "bathtub" effect has been created in the former tank pit (i.e., groundwater mounding and dispersion)?	☐ Yes ☐ No ☐ UND ☑ NE ☐ NA

Has Pertinent Information Been Provided?

Calculated mass remain in situ and contaminant degradation rate	☐ Yes ☐ No ☐ UND ☑ NE ☐ NA
Tables showing the maximum soil and groundwater concentrations detected at the site, and highest soil and groundwater concentration levels and deepest soil and groundwater concentrations remaining at the site after remediation	☐ Yes ☐ No ☐ UND ☑ NE ☐ NA
Site maps showing maximum detected groundwater concentrations and current groundwater conditions in each well	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Site maps and cross section(s) showing lithology, boring and well locations and depths, sampling results, contaminant contours, and remediation locations	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Tables and graphs showing vapor concentrations as well as periodic and cumulative vapor hydrocarbon removal rates and volumes, if vapor extraction has been conducted	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Tables and graphs showing periodic and cumulative free product and groundwater removal rates and volumes, if free product and/or groundwater remediation has been conducted at the site	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Disposal information concerning any impacted materials generated at the site, such as manifests (when available)	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Has the Source(s) Been Adequately Evaluated? (continued)	☐ Yes ☑ No ☐ UND

Is there indication that a new release(s) have occurred subsequent to the initial release? ☑ Yes ☐ No ☐ UND ☐ NE ☐ NA

Soil	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Groundwater	☑ Yes ☐ No ☐ UND ☐ NE ☐ NA
Soil Vapor	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Surface Water	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

If yes, then,

Is the site currently an active commercial fueling station?	☑ Yes ☐ No ☐ UND ☐ NE ☐ NA
Have the tanks, piping, and/or dispenser islands moved to a different location at the site?	☐ Yes ☐ No ☐ UND ☑ NE ☐ NA
Are there spikes or increasing concentration trends in historic data subsequent to the initial release?	☑ Yes ☐ No ☐ UND ☐ NE ☐ NA
Are there new detections of free product subsequent to the initial release in historic data?	☐ Yes ☐ No ☐ UND ☑ NE ☐ NA
Have new contaminants been detected in historic data subsequent to the initial release?	☑ Yes ☐ No ☐ UND ☐ NE ☐ NA
Have new petroleum hydrocarbon or other hazardous products been dispensed of at the site since the initial release occurred?	☑ Yes ☐ No ☐ UND ☐ NE ☐ NA
For active commercial fueling facilities, have the tanks failed tank tightness tests?	☐ Yes ☐ No ☐ UND ☑ NE ☐ NA
Is there indication of new impacts from offsite sources?	☐ Yes ☐ No ☐ UND ☑ NE ☐ NA

A description of the release history, including potential source(s) of releases, potential COCs associated with each potential release, confirmed source locations, confirmed release locations, and existing delineation of release areas? ☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

Primary leak source(s) (e.g., a tank, sump, pipeline, etc.)	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Secondary sources (e.g., high-concentration contaminants in low-permeability lithologic soil units that sustain groundwater or vapor plumes)	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Local and regional plan view maps that illustrate the location of sources (former facilities, piping, tanks, etc.)	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

(Source Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Has the Source(s) Been Adequately Evaluated? (continued)	☐ Yes ☑ No ☐ UND

Has the petroleum-impacted groundwater, at or immediately beneath the point of release from the primary source, been removed to the extent practicable? ☐ Yes ☐ No ☐ UND ☑ NE ☐ NA

If yes, then describe remediation method(s):

☐ AS/SVE	☐ DPE	☐ Excavation	☐ SVE	☐ P&T
☐ In-situ Injection	☐ Ozone Sparge	☐ PRB	☐ Other	

Is site remediation in progress? ☐ Yes ☑ No ☐ NA

If yes, then describe remediation method(s)

☐ AS/SVE	☐ DPE	☐ Excavation	☐ SVE	☐ P&T
☐ In-situ Injection	☐ Ozone Sparge	☐ PRB	☐ Other	

Estimated time frame to complete remediation:

☐ ≤ 6 months ☐ > 6 months and ≤ 1 year ☐ > 1 year and ≤ 5 years ☐ > 5 years

Identify impediments to removing petroleum-impacted groundwater:

☐ Remediation Was Designed Incorrectly	☐ Poor Remediation O&M
☐ Remediation Was Shut Off Prematurely	☐ Other
☐ Site conditions prevent secondary source (e.g., physical or infrastructural constraints exist whose removal or relocation would be technically or economically infeasible)	

Are additional removal or active remedial actions Necessary to abate a demonstrated threat to human health? ☐ Yes ☐ No ☐ UND ☑ NE ☐ NA

If yes, then describe:

(Source Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Has the Source(s) Been Adequately Evaluated? (continued)	☐ Yes ☑ No ☐ UND

Has petroleum-impacted soil, at or immediately beneath the point of release from the primary source, been removed to the extent practicable? ☐ Yes ☐ No ☐ UND ☑ NE ☐ NA

If yes, then describe remediation method(s):

☐ AS/SVE	☐ DPE	☐ Excavation	☐ SVE	☐ P&T
☐ In-situ Injection	☐ Ozone Sparge	☐ PRB	☐ Other	

Is site remediation in progress? ☐ Yes ☑ No ☐ NA

If yes, then describe remediation method(s)

☐ AS/SVE	☐ DPE	☐ Excavation	☐ SVE	☐ P&T
☐ In-situ Injection	☐ Ozone Sparge	☐ PRB	☐ Other	

Estimated time frame to complete remediation:

☐ ≤ 6 months ☐ > 6 months and ≤ 1 year ☐ > 1 year and ≤ 5 years ☐ > 5 years

Identify impediments to removing petroleum-impacted groundwater:

☐ Remediation Was Designed Incorrectly	☐ Poor Remediation O&M
☐ Remediation Was Shut Off Prematurely	☐ Other
☐ Site conditions prevent secondary source (e.g., physical or infrastructural constraints exist whose removal or relocation would be technically or economically infeasible)	

Are additional removal or active remedial actions Necessary to abate a demonstrated threat to human health? ☐ Yes ☐ No ☐ UND ☑ NE ☐ NA

If yes, then describe:

(Source Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Has the Source(s) Been Adequately Evaluated? (continued)	☐ Yes ☑ No ☐ UND

Has sufficient data been presented to demonstrate that site characterization activities have defined the horizontal and vertical extent of the plume?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Has plume stability been demonstrated using a valid technical analysis that considers the following?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
The accuracy of data from the wells	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Placement within the plume	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Changes in areal extent of the plume	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Valid concentration trends within the plume (Note: plotting of decreasing concentrations using data from a single well is not likely to be sufficient)	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Have the following factors been considered?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Seasonal variability	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Water level changes	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Sampling methods	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Well construction	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Other factors that can affect data	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Has a recent well survey that uses all available wells from the following agencies been presented?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Department of Water Resources	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Zone 7 Water Agency	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Alameda County Public Works	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Is data on supply wells located within 2,000 feet of the site presented?	☐ Yes ☑ No ☑ UND ☐ NE ☐ NA
Figure (with rose diagram) identifying each well	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Table with the well construction details	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

(Source Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Has the Source(s) Been Adequately Evaluated? (continued)	☐ Yes ☑ No ☐ UND

Has the following pertinent information been provided?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
History of pilot tests conducted at the site including the types of tests conducted, dates of actions, and results?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
History of corrective actions for the site including the types of cleanup actions taken, dates of the actions, and mass removed?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Figures depicting the location of the removal action?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Confirmation sampling results which demonstrate the effectiveness of secondary source removal?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Narrative description of the actions and areas of success or infeasibility of actions?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Long-term monitoring data for in-situ corrective actions that demonstrate the concentrations have not rebounded following the cessation of corrective actions?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

Has pertinent information been provided to assess if contamination consists only of petroleum?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Phase I Reports identifying potential COCs?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Description of site history, types of products or chemical used at the site?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Historic site /facilities maps showing locations of chemical storage, releases, underground utilities, and storm drains?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Historic aerial photos?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Sanborn Maps?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
History of types of releases?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Hazardous Material Business Plans?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Figures and tabulation and discussion of sampling results for all chemicals other than petroleum?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Data including figures and, tables and discussion of off-site sources?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Discussion of whether detected COCs in soil, soil vapor and groundwater are consistent with reported site uses and documented facility COCs?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

(Source Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☐ No ☐ UND
Has the Source(s) Been Adequately Evaluated? (continued)	☐ Yes ☐ No ☐ UND

Has Pertinent Information Been Provided?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Description of the history of release(s) and the actions that were were taken to stop each release not provided or incomplete?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Evaluation and accounting for changing contaminant?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Tabulation and discussion of sampling results and evaluation of increasing/decreasing concentration trends over the full time period of site investigation?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Concentration graphs versus time?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Tank Removal Report?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Tank Tightness Tests?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Initial Unauthorized Release report?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
UST Permit (current)?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Hazardous Materials Business Plans (historic and current)?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Data from other sites in the vicinity with unauthorized releases of petroleum hydrocarbons or other hazardous materials?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

End of Source Evaluation Section

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Have Contaminant Transport and Exposure Pathways Been Adequately Evaluated?	☐ Yes ☑ No ☐ UND

CA LUFT Manual Guidance Statement:

Contaminant Transport and Exposure Pathways – "Pathways are the mechanisms by which a receptor may contact the COCs at a site. Exposure pathways consist of: (1) a source of contaminants (as described previously), (2) contaminant transport or the physical migration of the contaminants, (3) a point of exposure where the receptor may come into contact with contaminants, and (4) an exposure route (such as ingestion or inhalation).

The Fate and Transport chapter of this Manual provides guidance on the various phases of petroleum constituents and how they behave in the subsurface. This information is critical for evaluating migration pathways or indirect exposure pathways. Typical migration pathways for LUFT sites include:

- LNAPL migration from the source area through soil.
- Dissolved-phase migration of COCs in the groundwater zone.
- Vapor migration of COCs from soil, groundwater, or LNAPL.
- Migration of COCs with groundwater and discharging of COCs to surface water.

In the surface-water example, the receptors may include ecological receptors as well as human receptors."

Points of Exposure – "A "point of exposure" is where a receptor comes into contact with contamination. The exposure point may, or may not, be at the same location as the source. Exposure points should include potential future uses of the land, including adjacent land if there is a potential for exposure to off-site receptors (e.g., groundwater containing LNAPL moving downgradient, or volatilization into a future residence). Some examples of points of exposure include:

- Surface soil
- Water faucet used for drinking water
- Air inside a residence or commercial/industrial building
- Outdoor (ambient) air (from volatilization from surface soil to air)

For ecological receptors, the exposure point may be surface water or sediment that has been impacted (or could become impacted) from the source.

Exposure Route - Exposure routes are the mechanisms by which receptors may come into contact with contamination. Exposure routes at LUFT sites include:

- Dermal contact with contaminated soil
- Ingestion of contaminated soil
- Inhalation of outdoor air impacted by volatile emissions
- Ingestion of contaminated groundwater
- Inhalation of vapors (in indoor air at a residence or commercial building) from contaminated soil, groundwater, or LNAPL
- Dermal contact with impacted surface water and/or sediments

While developing the CSM, each of the elements of a pathway should be considered and investigated as necessary. For example, if groundwater at the site is not potable and the COCs in groundwater are not expected to migrate and impact a current or future potable water source above established limits, then the groundwater migration pathway may be eliminated."

(Contaminant Transport and Exposure Pathways Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued) ☐ Yes ☑ No ☐ UND

Have Contaminant Transport and Exposure Pathways Been Adequately Evaluated? (continued) ☐ Yes ☑ No ☐ UND

Has soil gas contamination been fully characterized? ☐ Yes ☐ No ☐ UND ☐ NE ☑ NA

Have petroleum hydrocarbons been detected in soil gas? ☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

Motor Fuels: ☐ Yes ☐ No ☐ NE ☐ NA	☐ Leaded Gasoline ☐ Unleaded Gasoline	☐ Undifferentiated
TPH Middle Distillates: ☐ Yes ☐ No ☐ NE ☐ NA	☐ Diesel ☐ Stoddard Solvent ☐ Jet Fuel	☐ Kerosene ☐ Home Heating Fuel ☐ Others
Residual Fuels: ☐ Yes ☐ No ☐ NE ☐ NA	☐ Bunker C ☐ Waste Oils ☐ Hydraulic Oil	☐ Lubricating Oil ☐ Oil and Grease ☐ Others
Fuel Oxygenates: ☐ Yes ☐ No ☐ NE ☐ NA	☐ MTBE ☐ ETBE ☐ TAME	☐ TBA ☐ DIPE ☐ Others
Lead Scavengers: ☐ Yes ☐ No ☐ NE ☐ NA	☐ EDB ☐ EDC	
Aromatic Compounds: ☐ Yes ☐ No ☐ NE ☐ NA	☐ Benzene ☐ Toluene ☐ Ethylbenzene	☐ Xylenes ☐ Others
PAHs: ☐ Yes ☐ No ☐ NE ☐ NA	☐ Naphthalene ☐ Others	

Have other contaminants been detected in soil gas? ☐ Yes ☐ No ☐ UND ☐ NE ☑ NA

VOCs: ☐ Yes ☐ No ☐ NE ☐ NA	☐ PCE ☐ TCE ☐ VC	☐ Chloroform ☐ Chlorobenzene ☐ Others
SVOCs: ☐ Yes ☐ No ☐ NE ☐ NA	List:	
Dioxans & Furans: ☐ Yes ☐ No ☐ NE ☐ NA	List:	
Other PAHs: ☐ Yes ☐ No ☐ NE ☐ NA	☐ Creosote ☐ PNAs	
PCBs: ☐ Yes ☐ No ☐ NA ☐ NE	List:	
Phenols: ☐ Yes ☐ No ☐ NE ☐ NA	☐ Phenol ☐ Others	
Metals: ☐ Yes ☐ No ☐ NE ☐ NA	☐ Lead ☐ Cadmium ☐ Chromium	☐ Zinc ☐ Nickel ☐ Other
Organo Chlorine Herbicides and Pesticides: ☐ Yes ☐ No ☐ NE ☐ NA	List:	

(Contaminant Transport and Exposure Pathways Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Have Contaminant Transport and Exposure Pathways Been Adequately Evaluated? (continued)	☐ Yes ☑ No ☐ UND

Has surface water contamination been fully characterized? ☐ Yes ☑ No ☐ UND ☐ NE ☐ NA

Have petroleum hydrocarbons been detected in surface water? ☑ Yes ☐ No ☐ UND ☐ NE ☐ NA

Motor Fuels: ☑ Yes ☐ No ☐ NE ☐ NA	☐ Leaded Gasoline ☐ Unleaded Gasoline	☐ Undifferentiated
TPH Middle Distillates: ☐ Yes ☐ No ☑ NE ☐ NA	☐ Diesel ☐ Stoddard Solvent ☐ Jet Fuel	☐ Kerosene ☐ Home Heating Fuel ☐ Others
Residual Fuels: ☐ Yes ☐ No ☑ NE ☐ NA	☐ Bunker C ☐ Waste Oils ☐ Hydraulic Oil	☐ Lubricating Oil ☐ Oil and Grease ☐ Others
Fuel Oxygenates: ☐ Yes ☐ No ☐ NE ☐ NA	☐ MTBE ☐ ETBE ☐ TAME	☐ TBA ☐ DIPE ☐ Others
Lead Scavengers: ☐ Yes ☐ No ☐ NE ☐ NA	☐ EDB ☐ EDC	
Aromatic Compounds: ☑ Yes ☐ No ☐ NE ☐ NA	☐ Benzene ☐ Toluene ☐ Ethylbenzene	☐ Xylenes ☐ Others
PAHs: ☐ Yes ☐ No ☐ NE ☐ NA	☐ Naphthalene ☐ Others	

Have other contaminants been detected in surface water? ☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

VOCs: ☐ Yes ☐ No ☑ NE ☐ NA	☐ PCE ☐ TCE ☐ VC	☐ Chloroform ☐ Chlorobenzene ☐ Others
SVOCs: ☐ Yes ☐ No ☑ NE ☐ NA	List:	
Dioxans & Furans: ☐ Yes ☐ No ☑ NE ☐ NA	List:	
Other PAHs: ☐ Yes ☐ No ☑ NE ☐ NA	☐ Creosote ☐ PNAs	
PCBs: ☐ Yes ☐ No ☑ NA ☐ NE	List:	
Phenols: ☐ Yes ☐ No ☑ NE ☐ NA	☐ Phenol ☐ Others	
Metals: ☐ Yes ☐ No ☑ NE ☐ NA	☐ Lead ☐ Cadmium ☐ Chromium	☐ Zinc ☐ Nickel ☐ Other
Organo Chlorine Herbicides and Pesticides: ☐ Yes ☐ No ☐ NE ☑ NA	List:	

(Contaminant Transport and Exposure Pathways Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Have Contaminant Transport and Exposure Pathways Been Adequately Evaluated? (continued)	☐ Yes ☐ No ☐ UND

Has the site been evaluated for vapor intrusion? ☐ Yes ☐ No ☐ UND ☐ NE ☑ NA

Guidance Statement: Analyte List. Indoor air should be analyzed for all known and potential subsurface contaminants so that contaminants in the subsurface and indoor air can be correlated in the evaluation of vapor intrusion and the cumulative health risks associated with vapor intrusion can be characterized. Limiting the indoor air testing to a few target analytes is not recommended, particularly for initial sampling events. Subsequent to the initial sampling event, limiting target analytes might be justified on a case-by-case basis for sites that are fully characterized and all contaminants are known with certainty. Analyzing air samples for a large suite of analytes may detect vapor intrusion-derived contaminants not previously detected in the subsurface. Contaminants may not have been detected in the subsurface for various reasons, including but not limited to, a) elevated detection limits resulting from high concentrations of co-contaminants, b) sampling and analytical errors, c) temporal and spatial variation, d) inappropriate sampling locations and depths, and e) generation of unanticipated degradation and transformation products. Multiple lines of evidence should be used to determine vapor intrusion-derived contaminants. Data for indoor sources may indicate a potential background risk that should be communicated to occupants and considered in risk management decisions concerning the subsurface contamination. It is generally desirable to conduct concurrent sampling of other media, such as sub-slab soil gas, and/or groundwater, when sampling indoor air. Sampling all media concurrently will give a more accurate representation of contaminant migration and reduce the uncertainty associated with the temporal variability in contaminant concentration data."

"The chemicals in Table 1 [see next page] are volatile and toxic enough to pose an indoor air risk. If a site contains any of the chemical listed in Table 1, the site should be evaluated for vapor intrusion."

(DTSC, October 2011)

Does the site contain any of the chemicals listed in Table 1 (see next page)?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

(Contaminant Transport and Exposure Pathways Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☐ No ☐ UND
Have Contaminant Transport and Exposure Pathways Been Adequately Evaluated? (continued)	☐ Yes ☐ No ☐ UND

Table 1 – List of Chemicals to be Considered for the Vapor Intrusion Pathway (DTSC, Vapor Intrusion Guidance Manual)

Chemical	Chemical	Chemical
☐ 1,1,1,2-Tetrachloroethane	☐ Benzylchloride	☐ Hexachlorobenzene
☐ 1,1,1-Trichloroethane	☐ beta-Chloronaphthalene	☐ Hexachlorocyclopentadiene
☐ 1,1,2,2-Tetrachloroethane	☐ Biphenyl	☐ Hexachloroethane
☐ 1,1,2-Trichloro-1,2,2-trifluoroethane	☐ Bis(2-chloroethyl)ether	☐ Hexane
☐ 1,1,2-Trichloroethane	☐ Bis(2-chloroisopropyl)ether	☐ Hydrogen cyanide
☐ 1,1-Dichloroethane	☐ Bis(chloromethyl)ether	☐ Isobutanol
☐ 1,1-Dichloroethylene	☐ Bromodichloromethane	☐ Mercury (elemental)
☐ 1,2,3-Trichloropropane	☐ Bromoform	☐ Methacrylonitrile
☐ 1,2,4-Trichlorobenzene	☐ Carbon disulfide	☐ Methoxychlor
☐ 1,2,4-Trimethylbenzene	☐ Carbon tetrachloride	☐ Methyl acetate
☐ 1,2-Dibromo-3-chloropropane	☐ Chlordane	☐ Methyl acrylate
☐ 1,2-Dibromoethane	☐ Chlorobenzene	☐ Methyl bromide (bromomethane)
☐ 1,2-Dichlorobenzene	☐ Chlorodibromomethane	☐ Methyl chloride (chloromethane)
☐ 1,2-Dichloroethane	☐ Chlorodifluoromethane	☐ Methyl tert-butyl ether (MTBE)
☐ 1,2-Dichloropropane	☐ Chloroethane (ethyl chloride)	☐ Methylcyclohexane
☐ 1,3,5-Trimethylbenzene	☐ Chloroform	☐ Methylene bromide
☐ 1,3-Butadiene	☐ Chrysene	☐ Methylene chloride
☐ 1,3-Dichlorobenzene	☐ cis-1,2-Dichloroethylene	☐ Methylethylketone (2-butanone)
☐ 1,3-Dichloropropene	☐ Crotonaldehyde (2-butenal)	☐ Methylisobutylketone
☐ 1,4-Dichlorobenzene	☐ Cumene (isopropylbenzene)	☐ Methylmethacrylate
☐ 1,4-Dioxane	☐ DDE	☐ Monochlorobiphenyl (PCB)
☐ 1-Chlorobutane	☐ Dibenzofuran	☐ m-Xylene
☐ 2-Chloro-1,3-butadiene (chloroprene)	☐ Dichlorobiphenyl (PCB)	☐ Naphthalene
☐ 2-Chlorophenol	☐ Dichlorodifluoromethane	☐ n-Butylbenzene
☐ 2-Chloropropane	☐ Dieldrin	☐ Nitrobenzene
☐ 2-Methylnaphthalene	☐ Diisopropyl ether (DIPE)	☐ N-Nitroso-di-n-butylamine
☐ 2-Nitropropane	☐ Endosulfan	☐ n-Propylbenzene
☐ Acenaphthene	☐ Epichlorohydrin	☐ o-Nitrotoluene
☐ Acetaldehyde	☐ Ethyl ether	☐ o-Xylene
☐ Acetone	☐ Ethyl tert-butyl ether (ETBE)	☐ p-Xylene
☐ Acetonitrile	☐ Ethylacetate	☐ Pyrene
☐ Acetophenone	☐ Ethylbenzene	☐ sec-Butylbenzene
☐ Acrolein (propenal)	☐ Ethylene oxide	☐ Styrene
☐ Acrylonitrile	☐ Ethylmethacrylate	☐ Tert-amyl methyl ether (TAME)
☐ Aldrin	☐ Fluorene	☐ Tert-butyl alcohol (TBA)
☐ alpha-HCH (alpha-BHC)	☐ Furan	☐ tert-Butylbenzene
☐ Benzaldehyde	☐ gamma-HCH (lindane)	☐ Tetrachloroethylene
☐ Benzene	☐ Heptachlor	☐ Toluene
☐ Benzo(b)fluoranthene	☐ Hexachloro-1,3-butadiene	☐ trans-1,2-Dichloroethylene

(Contaminant Transport and Exposure Pathways Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Have Contaminant Transport and Exposure Pathways Been Adequately Evaluated? (continued)	☐ Yes ☑ No ☐ UND

Mitigation Measures and Engineering Controls:

As a result of controlling exposure through the use of mitigation measures and/or engineering controls, has it been determined that the concentrations of petroleum constituents in soil will have no significant risk of adversely affecting human health? ☐ Yes ☐ No ☐ UND ☑ NE ☐ NA

Are there existing mitigation measures and engineering controls at the site? ☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

☐ Vapor Intrusion Barriers	☐ Subslab Ventilation	☑ Interceptor Trench
☐ Cap	☐ Permeable Reactive Barrier	☐ Other

If other, then describe:

Are there proposed mitigation measures and engineering controls at the site? ☑ No

☐ Vapor Intrusion Barriers	☐ Sub-slab Ventilation	☐ Interceptor Trench
☐ Cap	☐ Permeable Reactive Barrier	☐ Other

If other, then describe: None proposed

Has Pertinent Information Been Provided? ☐ Yes ☑ No ☐ UND ☐ NE ☐ NA

Financial assurance Requirements	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Soil Management Plan	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Mitigation or Engineering Control System Documentation	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA

- ☑ Design documents
- ☑ Construction documents
- ☑ As-built Documentation
- ☑ Operations & Maintenance Plans
- ☑ Monitoring and Reporting Plan
- ☑ Contingency Plans

(Contaminant Transport and Exposure Pathways Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☒ No ☐ UND
Have Contaminant Transport and Exposure Pathways Been Adequately Evaluated? (continued)	☐ Yes ☒ No ☐ UND

Institutional Controls:

As a result of controlling exposure through the use of Institutional controls (existing or proposed), has it been determined that the concentrations of petroleum constituents in soil will have no significant risk of adversely affecting human health? ☐ Yes ☐ No ☐ UND ☒ NE ☐ NA

Are proprietary controls in place or proposed:

☐ Easements ☐ Covenants ☐ Other

Are governmental controls in place or proposed?

☐ Zoning Ordinances	☐ Waste Discharge Requirements
☐ Building Modification Restrictions	☐ Financial Assurance Mechanisms
☐ Groundwater Use Restrictions	☐ Enforcement Mechanisms
☐ Air Permits	☐ Other
☐ Excavation Restrictions	

Are informational devices in place or proposed:

☐ Health Advisories	☐ SWRCB GeoTracker Website
☐ Deed Notices	☐ Other State Registries or Tracking Systems

(Contaminant Transport and Exposure Pathways Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☐ No ☐ UND
Have Contaminant Transport and Exposure Pathways Been Adequately Evaluated? (continued)	☐ Yes ☐ No ☐ UND

Has a utility corridor assessment been conducted to determine if utility corridors (sewer, electrical, fiber optic cable, cable, water, etc) are present?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Have facility and public records showing the spatial locations of existing utility corridors been reviewed?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Is there enough information for a CSM?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Do future development activities include new utility corridors or covering of large areas of the site with pavement that may significantly alter vapor migration and concentrations?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Do these conduits lead from subsurface contamination to occupied buildings	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Does a continuous low permeability surface (such as pavement or surface clay layers) cover the ground between the contamination and the building?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Does the vadose zone have very high gas permeability due to fracturing?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Has a field investigation been conducted of utility corridors (active and/or passive soil gas survey)?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Are vapors present in the utility corridors?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Do vapors pose and unacceptable risk to indoor occupants?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Have remedial actions been developed and implemented to mitigate vapors in the utility corridors?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

(Contaminant Transport and Exposure Pathways Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Have Contaminant Transport and Exposure Pathways Been Adequately Evaluated? (continued)	☐ Yes ☑ No ☐ UND

Vapor Intrusion Evaluation

Has the subsurface contamination reached steady state state conditions (i.e., have the subsurface soil gas and groundwater plumes reached the maximum migration potential)?	☑ Yes ☐ No ☐ UND ☐ NE ☐ NA
Has data been collected over a sufficient period of time to determine contaminant trends of groundwater monitoring plumes?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Do temporal contaminant trends of data collected from routine sampling of groundwater monitoring wells indicate stable or decreasing treads?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Has data been collected over a sufficient period of time to determine contaminant trends of soil gas plumes?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Do temporal contaminant trends of data collected from routine sampling of permanent or temporary soil gas sampling points indicate stable or decreasing treads?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
If there is minimal temporal soil gas data, has the length of time to reach steady-state conditions been estimated from the date that the chemical releases ceased at the site using the methods in Johnson and others (1999)	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

Have Existing and Future Buildings been Evaluated?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Have existing buildings within 100 feet of soil gas or groundwater plumes been evaluated for vapor intrusion?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Have existing buildings greater than 100 feet from a plume boundary, with a preferential pathway(either natural or anthropogenic) that link the buildings with the contaminant plume been evaluated for vapor intrusion been evaluated for vapor intrusion?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
For future buildings, do development activities include new utility corridors or covering of large areas of the site with pavement that may significantly alter vapor migration and concentrations?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
At sites where unacceptable contaminant levels are left in the subsurface, are engineering controls proposed for future buildings within 100 feet from contamination?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Does a continuous low permeability surface (such as pavement or surface clay layers) cover the ground between the contamination and the building?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Does the vadose zone have very high gas permeability due to fracturing?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

(Contaminant Transport and Exposure Pathways Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assessee the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Have Contaminant Transport and Exposure Pathways Been Adequately Evaluated? (continued)	☐ Yes ☑ No ☐ UND

Has a site specific risk assessment been conducted in accordance the risk assessment guidance documents referenced in the SWRCB Technical Justification for Soil Screening Levels for Direct Contact and Outdoor Air Exposure Pathways (SWRCB, 2012)?	☑ Yes ☑ No ☐ UND ☐ NE ☐ NA
USEPA "Risk Assessment Guide for Superfund (RAGS) Volume I Human Health Evaluation Manual (Part A)", EPA/540/1/89/002, December 1989	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
ASTM "Standard Guide to Risk-Based Corrective Action Applied at Petroleum Release Sites", E1739-95,1995	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
DTSC Office of Human and Ecological Risk (HERO) "Recommended DTSC Default Exposure Factors for Use in Risk Assessment at California Hazardous Waste Sites and Permitted Facilities", May 2011	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
USEPA "Integrated Risk Information System (on-line database of toxicity parameters (May 2011)	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

Was the risk assessment conducted in accordance with the DTSC Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (October 2011)?	☐ Yes ☐ No ☐ UND ☐ NE ☑ NA
Were the following DTSC Guidance recommendations followed?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Use of multiple lines of evidence (i.e., soil gas, soil matrix, and groundwater data) to reasonably estimate the level of risk posed by vapor intrusion?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Use of maximum contaminant concentrations (i.e., data collected above the source)?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Use of reasonable site-specific input parameters in the California version of the USEPA's Vapor Intrusion Model by Johnson and Ettinger, created by the DTSC to include California-specific chemical toxicity factors?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Calculation of cumulative health effects conducted?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Use of data representing seasonable variability before making a final risk determination as short term measurements rarely represent long-term conditions?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
No preferential pathways exist at the site?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Knowledge of adjacent building construction (e.g., slab-on-grade, crawl spaces, etc.)?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

(Contaminant Transport and Exposure Pathways Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Have Contaminant Transport and Exposure Pathways Been Adequately Evaluated? (continued)	☐ Yes ☑ No ☐ UND

Preferential pathway study to determine the potential probability of non-aqueous phase liquid (NAPL) and/or plumes (groundwater and/or soil vapor) encountering preferential pathways and conduits (geologic and anthropogenic) that can act as contaminant migration pathways to or from the site? ☐ Yes ☐ No ☐ UND ☑ NE ☐ NA

Evaluation of historic land uses at and in the vicinity of the site?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Identification of underground utility lines and trenches (e.g., sewers, storm drains, water, electric, gas, remediation piping, trench backfill, etc.) and wells that could act as preferential pathways within and near the site and plume area(s)?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Maps and cross-sections illustrating historic groundwater elevations at the site and location and depth of all utility lines and trenches within and near the site and plume areas(s)?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Identification of all active, inactive, standby, decommissioned (sealed with concrete), unrecorded, and abandoned (improperly decommissioned or lost) wells including monitoring, remediation, irrigation, water supply, dewatering, drainage, and cathodic protection wells within a one mile radius of the subject site?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Copies of historical maps, such as Sanborn maps, aerial photographs, etc.?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

*****End of Contaminant Transport and Exposure Pathways Evaluation Section*****

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Have Receptors Been Adequately Evaluated?	☐ Yes ☑ No ☐ UND

CA LUFT Manual Guidance Statement:

Receptors – "A receptor is a human or other living organism with the potential to be exposed to and adversely affected by contaminants as a result of contact with contaminated media either at the source or along a contaminant migration pathway. Potential receptors at LUFT sites may include:

- Adults and children in a residential scenario
- Adults in an occupational scenario
- Adults in a construction/utility worker scenario
- Adults and children using groundwater that has been contaminated by a release at the site as a potable water supply
- Aquatic receptors such as fish and benthic invertebrates

"Sensitive" human receptors are not evaluated separately, because the California Environmental Protection Agency (Cal/EPA) and the United States Environmental Protection Agency (EPA) toxicity values used in risk evaluations already consider sensitive subgroups.

Terrestrial ecological receptors may not be a very common type of receptor, considering that LUFT sites are typically small, paved, and located in largely urban and/or otherwise disturbed environments. Significant impacts to ecological receptors are unlikely to occur in most cases. However, if the potential to impact sensitive habitats or nearby surface water exists, these receptors should be included in the CSM. Situations in which potential impacts to ecological receptors may warrant evaluation include cases in which impacted groundwater may migrate and discharge to nearby surface-water bodies and cases in which the LUFT site is located in areas where special-status ecological receptors may reside.

It is important to consider the current and reasonably likely future uses of the site and adjacent properties when identifying receptors. Local zoning and planning agencies can generally assist in these determinations. Determining conditional uses at the LUFT site and adjacent properties is important, because changes in use may require consideration of different receptors. For example, a light-industrial park being re-developed for residential living needs to be evaluated for both adults and children who may live on the property.

Receptor Identification - The types of potential receptors located on adjacent properties should be identified if they could come onto the site or be exposed to the chemicals at the site. The extent of the area where receptors should be identified will vary based on the exposure pathways, as well as the extent and type of contamination.

In order to identify whether receptors may be drinking potentially impacted groundwater, a survey of water supply wells near the site may be conducted. (See the Fate and Transport chapter for more information on potential plume lengths.) This survey is generally based on reviewing Department of Water Resources (DWR) well records and asking local water district and applicable City and/or County staff if they are aware of any wells within the search radius. Areas with known multiple private wells nearby may require door-to-door contact of local residents to determine their source of water.

Information about water-supply wells can often be obtained from the well owner. Desired information includes:

- Current status of the well (operational or idle) and pumping rate.
- Purpose of the well, such as drinking water, irrigation, industrial, livestock, etc.
- Well construction details (i.e., the depth and length of the well screen and sand pack interval)."

(Receptors Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Have Receptors Been Adequately Evaluated? (continued)	☐ Yes ☑ No ☐ UND

Has the following pertinent information been provided?

Has sufficient data been presented to demonstrate that site characterization is complete for the prescribed depth ranges of 0 to 5 feet in order to assess protection from ingestion of soil, dermal contact with soil, and inhalation of volatile soil emissions and inhalation of particulate emissions?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Has sufficient data been presented to demonstrate that site characterization is complete for the prescribed depth ranges of 5 to 10 feet in order to assess protection from inhalation of volatile soil emissions?	☐ Yes ☐ No ☐ UND ☑ NE ☐ NA
Has analytical data for all chemicals of concern including total petroleum hydrocarbons been presented in order to assess whether unique conditions not considered in the Policy may exist at the site?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Have figures and tables showing the soil data for each of the prescribed depth ranges with a comparison to the screening levels for each exposure scenario been presented?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Has data representativeness, quality, and spatial distribution relative to current or potential receptors and sources, and temporal variability been considered in the evaluation?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Has a description of current and expected future land use, redevelopment, or construction for the site been presented?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

Sufficient data to evaluate whether site contamination is present in locations that currently exist or potentially could exist in the future to pose nuisance conditions during common or reasonably expected site activities?	☑ Yes ☐ No ☐ UND ☐ NE ☐ NA
Descriptions of the type and vertical and lateral extent of shallow soil?	☑ Yes ☐ No ☐ UND ☐ NE ☐ NA
Data on the lateral extent of surface soil contamination?	☑ Yes ☐ No ☐ UND ☐ NE ☐ NA
Discussion of odors or visual evidence of contamination?	☑ Yes ☐ No ☐ UND ☐ NE ☐ NA
Preferential pathway and utility conduit surveys?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Review of potential points for exposure such as groundwater seeps into basements?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Current use of the site?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Expected use of the site?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Description of surface water runoff from the property to storm drains or other sites?	

(Receptors Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Have Receptors Been Adequately Evaluated? (continued)	☐ Yes ☑ No ☐ UND

If Yes, then Describe Nuisance Condition:

Is injurious to health, indecent or offensive to the senses, or is an obstruction to the free use of property so as to interfere with the comfortable enjoyment of life or property?	☑ Yes ☐ No ☐ UND ☐ NE ☐ NA
Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal?	☑ Yes ☐ No ☐ UND ☐ NE ☐ NA
Occurs during, or as a result of, the treatment or disposal of wastes?	☑ Yes ☐ No ☐ UND ☐ NE ☐ NA

(Receptors Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Have Receptors Been Adequately Evaluated? (continued)	☐ Yes ☑ No ☐ UND

Are indoor air concentrations in existing buildings acceptable? ☐ Yes ☐ No ☐ UND ☐ NE ☑ NA

Is the site a candidate for vapor intrusion?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Has a site-specific evaluation of vapor intrusion been conducted in accordance with the USEPA Vapor Intrusion model?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Have the geotechnical parameters in the model been adequately determined to reduce uncertainty concerning human health exposure (i.e., have physical properties (i.e., bulk density, grain size distribution, total porosity, moisture content, fraction of organic carbon) of the vadose zone been determined)?	☐ Yes ☐ No
Has the average soil and groundwater temperature been used to correct Henry's law constant for the chemical of concern?	☐ Yes ☐ No
Is there an imminent hazard in existing buildings?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Has an emergency remedial action been conducted?	☐ Yes ☐ No
Does the site pass a screening evaluation?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Has a Building Survey been conducted?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Have indoor air samples been collected and data evaluated?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

(Receptors Evaluation section continued on next page)

General Criteria e: Has a conceptual site model that adequately assesses the nature, extent, and mobility of the release been developed? (continued)	☐ Yes ☑ No ☐ UND
Have Receptors Been Adequately Evaluated? (continued)	☐ Yes ☑ No ☐ UND

Has the following Pertinent Information been Provided? (continued)

Land uses and exposure scenarios on the facility and adjacent properties?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Beneficial resources (e.g., groundwater classification, wetlands, natural resources, etc.)?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Resource use locations (e.g., water supply wells, surface water intakes)?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Subpopulation types and locations (e.g., schools, hospitals, day care centers, etc.)?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Exposure scenarios (e.g. residential, industrial, recreational, farming)?	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Exposure pathways and potential threat to sensitive receptors	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Analysis of the contaminant volatilization from the subsurface to indoor/outdoor air exposure route (i.e., vapor pathway)?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Sanborn maps?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Aerial photographs?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Site development plans?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

Are there existing water supply wells or other sources of water in the vicinity of the site? ☑ Domestic Water Supply Wells ☑ Irrigation Wells ☐ Other Capture Systems	☑ Yes ☐ No ☐ UND ☐ NE ☐ NA
Are these supply wells or other sources of water used by property owners/tenants in the vicinity of the site?	☐ Yes ☐ No ☐ UND ☑ NE ☐ NA
Have these supply wells or other sources of water been sampled for chemicals of concern (COCs) associated with the release site?	☑ Yes ☑ No ☐ UND ☐ NE ☐ NA
Have these supply wells or other sources of been properly abandoned?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Could these other water sources be reasonably anticipated to be relied on by property owners in the site vicinity during drought conditions or post emergency situations?	☑ Yes ☐ No ☐ UND ☐ NE ☐ NA

DWR Well Search	☑ Yes ☑ No ☐ UND ☐ NE ☐ NA
Alameda County Public Works Well Search	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Neighborhood backyard domestic water/irrigation well assessment including canvassing/survey results	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Agreements between Responsible Parties (RPs) and property owners to discontinue operation of domestic well use	☐ Yes ☑ No ☐ UND ☐ NE ☐ NA
Results of domestic well sampling and analytical results	☑ Yes ☑ No ☐ UND ☐ NE ☐ NA
Well destruction records	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

End of Receptors Evaluation Section

End of General Criteria e Evaluation Section

General Criteria f - Has secondary source been removed to the extent practicable? ☐ Yes ☐ No ☑ UND

LTCP Statement: "Secondary source" is defined as petroleum-impacted soil or groundwater located at or immediately beneath the point of release from the primary source. Unless site attributes prevent secondary source removal (e.g. physical or infrastructural constraints exist whose removal or relocation would be technically or economically infeasible), petroleum-release sites are required to undergo secondary source removal to the extent practicable as described herein. "To the extent practicable" means implementing a cost-effective corrective action which removes or destroys-in-place the most readily recoverable fraction of source-area mass. It is expected that most secondary mass removal efforts will be completed in one year or less. Following removal or destruction of the secondary source, additional removal or active remedial actions shall not be required by regulatory agencies unless (1) necessary to abate a demonstrated threat to human health or (2) the groundwater plume does not meet the definition of low threat as described in this policy."

CA LUFT Manual Guidance:

Has pertinent information been provided in the CSM for compliance evaluation? (refer to General Criteria e for specific information) ☐ Yes ☑ No ☐ UND

End of General Criteria f evaluation section

General Criteria g - Has soil or groundwater been tested for MTBE and results reported in accordance with Health and Safety Code Section 25296.15? ☑ Yes ☐ No ☐ UND

LTCP Statement: "Health and Safety Code section 25296.15 prohibits closing a UST case unless the soil, groundwater, or both, as applicable have been tested for MTBE and the results of that testing are known to the Regional Water Board. The exception to this requirement is where a regulatory agency determines that the UST that leaked has only contained diesel or jet fuel. Before closing a UST case pursuant to this policy, the requirements of section 25296.15, if applicable, shall be satisfied."

CA LUFT Manual Guidance:

Has pertinent information been provided in the CSM for compliance evaluation? (refer to General Criteria e for specific information) ☑ **Yes** ☐ **No** ☐ **UND**

End of General Criteria g Evaluation Section

General Criteria h: Does a nuisance as defined by Water Code section 13050 exist at the site? ☑ Yes ☐ No ☐ UND

LTCP Statement: "Water Code section 13050 defines "nuisance" as anything which meets all of the following requirements:

(1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.

(2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.

(3) Occurs during, or as a result of, the treatment or disposal of wastes.

For the purpose of this policy, waste means a petroleum release."

CA LUFT Manual Guidance:

Has pertinent information been provided in the CSM for compliance evaluation? (refer to General Criteria e for specific information) ☑ **Yes** ☐ **No** ☐ **UND**

End of General Criteria h Evaluation Section

1. **Media Specific Criteria: Groundwater**: Does the site meet the LTCP criteria for groundwater? ☐ Yes ☐ No ☑ UND

LTCP Statement: "This policy describes criteria on which to base a determination that threats to existing and anticipated beneficial uses of groundwater have been mitigated or are de minimis, including cases that have not affected groundwater.

State Water Board Resolution 92-49, *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304* is a state policy for water quality control and applies to petroleum UST cases. Resolution 92-49 directs that water affected by an unauthorized release attain either background water quality or the best water quality that is reasonable if background water quality cannot be restored. Any alternative level of water quality less stringent than background must be consistent with the maximum benefit to the people of the state, not unreasonably affect current and anticipated beneficial use of affected water, and not result in water quality less than that prescribed in the water quality control plan for the basin within which the site is located. Resolution No. 92-49 does not require that the requisite level of water quality be met at the time of case closure; it specifies compliance with cleanup goals and objectives within a reasonable time frame.

Water quality control plans (Basin Plans) generally establish "background" water quality as a restorative endpoint. This policy recognizes the regulatory authority of the Basin Plans but underscores the flexibility contained in Resolution 92-49.

It is a fundamental tenet of this low-threat closure policy that if the closure criteria described in this policy are satisfied at a petroleum unauthorized release site, attaining background water quality is not feasible, establishing an alternate level of water quality not to exceed that prescribed in the applicable Basin Plan is appropriate, and that water quality objectives will be attained through natural attenuation within a reasonable time, prior to the expected need for use of any affected groundwater.

If groundwater with a designated beneficial use is affected by an unauthorized release, 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 listed below. A plume that is "stable or decreasing" is a contaminant mass that has expanded to its maximum extent: the distance from the release where attenuation exceeds migration."

CA LUFT Manual Guidance:

(Media Specific Criteria for Groundwater Evaluation section continued on next page)

LOW THREAT UST CASE CLOSURE POLICY COMPLIANCE AND IDENTIFICATION OF IMPEDIMENTS TO CASE CLOSURE CHECKLIST
ALAMEDA COUNTY ENVIRONMENTAL HEALTH LOCAL OVERSIGHT PROGRAM

1. **Media Specific Criteria: Groundwater:** Does the site meet the LTCP criteria for groundwater?	☐ Yes ☐ No ☑ UND
Does the Site Qualify for the Soil Only Case Exemption (Release has not Affected Groundwater)?	☐ Yes ☑ No ☐ UND

LTCP Statement: "Sites with soil that does not contain sufficient mobile constituents [leachate, vapors, or light non-aqueous-phase liquids (LNAPL)] to cause groundwater to exceed the groundwater criteria in this policy shall be considered low-threat sites for the groundwater medium. Provided the general criteria and criteria for other media are also met, those sites are eligible for case closure. For older releases, the absence of current groundwater impact is often a good indication that residual concentrations present in the soil are not a source for groundwater pollution."

CA LUFT Manual Guidance:

Has pertinent information been provided in the CSM for compliance evaluation? (refer to General Criteria e for specific information) ☑ **Yes** ☐ **No** ☐ **UND**

*****End of Soil Only Exemption evaluation section*****

(Media Specific Criteria for Groundwater Evaluation section continued on next page)

1. **Media Specific Criteria: Groundwater**: Does the site meet the LTCP criteria for groundwater?	☐ Yes ☐ No ☑ UND
If Site Does Not Qualify for Soil Only Exemption, then, **Is the contaminant plume that exceeds water quality objectives stable or decreasing in areal extent, and meets all of the additional characteristics of one of the five classes of sites listed below?**	☐ Yes ☐ No ☐ UND

[redacted]

LTCP Statement: "A plume that is stable or decreasing is a contaminant mass that has expanded to its maximum extent: the distance from the release where attenuation exceeds migration."

CA LUFT Manual Guidance:

Has pertinent information been provided in the CSM for compliance evaluation? (refer to General Criteria e for specific information) ☐ **Yes** ☐ **No** ☐ **UND**

*****End of Plume Stability Evaluation Section*****

(Media Specific Criteria for Groundwater Evaluation section continued on next page)

1. Media Specific Criteria: Groundwater: Does the site meet the LTCP criteria for groundwater?	☐ Yes ☐ No ☐ UND
Is the contaminant plume that exceeds water quality objectives stable or decreasing in areal extent, and meets all of the additional characteristics of one of the five classes of sites listed below? (continued)	☐ Yes ☑ No ☐ UND

CA LUFT Manual Guidance:

(Plume Characteristics Evaluation continued on next page)

(Media Specific Criteria for Groundwater Evaluation section continued on next page)

LOW THREAT UST CASE CLOSURE POLICY COMPLIANCE AND IDENTIFICATION OF IMPEDIMENTS TO CASE CLOSURE CHECKLIST
ALAMEDA COUNTY ENVIRONMENTAL HEALTH LOCAL OVERSIGHT PROGRAM

1. **Media Specific Criteria: Groundwater**: Does the site meet the LTCP criteria for groundwater?	☐ Yes ☐ No ☐ UND
Is the contaminant plume that exceeds water quality objectives stable or decreasing in areal extent, and meets all of the additional characteristics of one of the five classes of sites listed below? (continued)	☐ Yes ☐ No ☐ UND

Class 1	☐ Yes ☒ No ☐ UND
Is < 100 feet in length	☐ Yes ☐ No ☐ UND
There is no free product	☐ Yes ☐ No ☒ UND
The nearest existing water supply well is > 250 feet from the defined plume boundary	☐ Yes ☐ No ☐ UND
The nearest existing surface water body is > 250 feet from the defined plume boundary	☐ Yes ☐ No ☐ UND

Class 2	☐ Yes ☒ No ☐ UND
Is < 250 feet in length	☐ Yes ☐ No ☐ UND
There is no free product	☐ Yes ☐ No ☒ UND
The nearest existing water supply well is > 1,000 feet from the defined plume boundary	☐ Yes ☐ No ☐ UND
The nearest existing surface water body is > 1,000 feet from the defined plume bouridary	☐ Yes ☐ No ☐ UND
The dissolved concentration of benzene is <3,000 µg/L	☐ Yes ☐ No ☐ UND
The dissolved concentration of MTBE is <1,000 µg/L	☐ Yes ☐ No ☐ UND

Class 3	☐ Yes ☒ No ☐ UND
Is < 250 feet in length	☐ Yes ☐ No ☐ UND
Free product has been removed to the maximum extent practicable, may still be present below the site where the release originated, but does not extend off-site	☐ Yes ☐ No ☒ UND
The plume has been stable or decreasing for a minimum of 5 years	☐ Yes ☐ No ☐ UND
The nearest existing water supply well is > 1,000 feet from the defined plume boundary	☐ Yes ☒ No ☐ UND
The nearest existing surface water body is > 1,000 feet from the defined plume boundary	☐ Yes ☒ No ☐ UND
The property owner is willing to accept a land use restriction if the regulatory agency requires a land use restriction as a condition for closure	☐ Yes ☐ No ☐ UND

Class 4	☐ Yes ☒ No ☐ UND
Is < 1,000 feet in length	☐ Yes ☐ No ☐ UND
There is no free product	☐ Yes ☐ No ☒ UND
The nearest existing water supply well or surface water body is > 1,000 feet from the defined plume boundary	☐ Yes ☒ No ☐ UND
The nearest existing surface water body is > 1,000 feet from the defined plume boundary	☐ Yes ☒ No ☐ UND
The dissolved concentration of benzene is <1,000 µg/L	☐ Yes ☐ No ☐ UND
The dissolved concentration of MTBE is <1,000 µg/L	☐ Yes ☐ No ☐ UND

Class 5	☐ Yes ☒ No ☐ UND
The regulatory agency determines, based on an analysis of site specific conditions, that the site under current and reasonable 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 will be achieved within a reasonable time frame	☐ Yes ☒ No ☐ UND

1. **Media Specific Criteria: Groundwater**: Does the site meet the LTCP criteria for groundwater?	☐ Yes ☐ No ☐ UND
Is the contaminant plume that exceeds water quality objectives stable or decreasing in areal extent, and meets all of the additional characteristics of one of the five classes of sites listed below? (continued)	☐ Yes ☐ No ☐ UND

Indicate those conditions that do not meet the characteristics of one of the five classes of sites listed above.

Plume Length (That Exceeds Water Quality Objectives)	☐ ≥ 100 feet and < 250 feet
	☐ ≥ 250 feet and < 1,000 feet
	☐ ≥ 1,000 feet
	☐ Unknown
Free Product in Groundwater	☐ Yes
	☐ No
	☑ Unknown
Free Product Has Been Removed to the Maximum Extent Practicable	☐ No
	☑ Unknown
For Sites with Free Product, the Plume has Been Stable or Decreasing for 5-Years	☐ No
	☐ Unknown
For Sites with Free Product, owner Willing to Accept a Land Use Restriction (If Required)	☐ No
	☐ Unknown
Free Product Extends Offsite	☐ Yes
	☐ Unknown
Benzene Concentration	☐ ≥ 1,000 µg/L and < 3,000 µg/L
	☐ ≥ 3,000 µg/L
	☐ Unknown
MTBE Concentration	☐ ≥ 1,000 µg/L
	☐ Unknown
Nearest Supply Well (From Plume Boundary)	☐ ≤ 250 Feet
	☑ > 250 Feet and ≤ 1,000 Feet
	☐ Unknown
Nearest Surface Water Body (From Plume Boundary)	☐ ≤ 250 Feet
	☑ > 250 Feet and ≤ 1,000 Feet
	☐ Unknown

*****End of Evaluation of Media Specific Criteria for Groundwater Section*****

2. Media Specific Criteria: Petroleum Vapor Intrusion to Indoor Air: Does the site meet the LTCP criteria for petroleum vapor intrusion to indoor air? ☐ Yes ☐ No ☐ UND

Policy Statement: "Exposure to petroleum vapors migrating from soil or groundwater to indoor air may pose unacceptable human health risks. This policy describes conditions, including bioattenuation zones, which if met will assure that exposure to petroleum vapors in indoor air will not pose unacceptable health risks. In many petroleum release cases, potential human exposures to vapors are mitigated by bioattenuation processes as vapors migrate toward the ground surface. For the purposes of this section, the term "bioattenuation zone" means an area of soil with conditions that support biodegradation of petroleum hydrocarbon vapors.

The low-threat vapor-intrusion criteria described below apply to sites where the release originated and impacted or potentially impacted adjacent parcels when:

(1) existing buildings are occupied or may be reasonably expected to be occupied in the future, or

(2) buildings for human occupancy are reasonably expected to be constructed in the future.

Appendices 1 through 4 (attached) illustrate four potential exposure scenarios and describe characteristics and criteria associated with each scenario. Petroleum release sites shall satisfy the media-specific criteria for petroleum vapor intrusion to indoor air and be considered low-threat for the vapor-intrusion-to-indoor-air pathway if:

a. Site-specific conditions at the release site satisfy all of the characteristics and criteria of scenarios 1 through 3 as applicable, or all of the characteristics and criteria of scenario 4 as applicable; or

b. A site-specific risk assessment for the vapor intrusion pathway is conducted and demonstrates that human health is protected to the satisfaction of the regulatory agency; or

c. As a result of controlling exposure through the use of mitigation measures or through the use of institutional or engineering controls, the regulatory agency determines that petroleum vapors migrating from soil or groundwater will have no significant risk of adversely affecting human health."

EXEMPTION – Active Commercial Petroleum Facility: Is the site an active commercial petroleum fueling facility? ☑ Yes ☐ No ☐ UND

LTCP Statement: "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. Therefore, 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."

Are release characteristics reasonably believed to pose an unacceptable health risk to facility users or nearby facilities? ☐ Yes ☐ No ☑ UND ☐ NE ☐ NA

On-site Users or Workers	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Residences	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Day Care Facilities	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Schools	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Mixed-Use Developments	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Hospitals	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Senior Facilities	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Commercial Sites	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

*****End of active commercial petroleum fueling facility evaluation*****

(Media Specific Criteria for Vapor Intrusion to Indoor Air Evaluation continued on next page)

2. Media Specific Criteria: Petroleum Vapor Intrusion to Indoor Air: Does the site meet the LTCP criteria for petroleum vapor intrusion to indoor air?	☐ Yes ☐ No ☐ UND
Does the release site meet one of the three petroleum vapor intrusion to indoor air specific criteria listed below (a, b, or c)?	☐ Yes ☐ No ☐ UND

[redacted]

Scenario 1: Unweathered LNAPL In Groundwater ☐ Yes ☐ No	
The bioattenuation zone is a continuous zone provides a separation of at least 30 feet vertically between the LNAPL in groundwater and the foundation of existing or potential buildings; and	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Total TPH (TPH-g and TPH-d combined) are less than 100 mg/kg throughout the entire depth of the bioattenuation zone	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Scenario 2: Unweathered LNAPL in Soil ☐ Yes ☐ No	
The bioattenuation zone is a continuous zone that provides a separation of at least 30 feet vertically between the LNAPL in soil and the foundation of existing or potential buildings; and	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Total TPH (TPH-g and TPH-d combined) are <100 mg/kg throughout the entire lateral and vertical extent of the bioattenuation zone	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Scenario 3: Dissolved Phase Benzene Concentrations In Groundwater ☐ Yes ☐ No	

Defining the Bioattenuation Zone For Sites without Oxygen Data or Where Oxygen is <4% ☐ Yes ☐ No

Figure A: For Benzene concentrations < 100 µg/l ☐ Yes ☐ No	
The bioattenuation zone is a continuous zone that provides a separation of at least 5 feet vertically between the dissolved phase benzene and the foundation of existing or potential buildings; and	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Contains total TPH (TPH-g and TPH-d combined) < 100 mg/kg throughout the entire depth of the bioattenuation zone	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

-OR-

Figure B: For Benzene concentrations ≥ 100 µg/L but < 1,000 µg/L ☐ Yes ☐ No	
The bioattenuation zone is a continuous zone that provides a separation of at least 10 feet vertically between the dissolved phase benzene and the foundation of existing or potential buildings	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

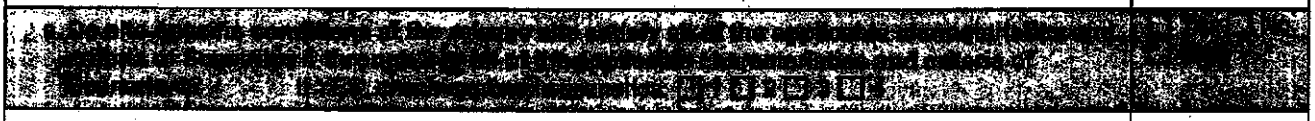
Defining the Bioattenuation Zone For Sites with Oxygen ≥ 4% ☐ Yes ☐ No

Figure C: For Benzene concentrations < 1,000 µg/L ☐ Yes ☐ No	
A continuous zone that provides a separation of at least 10 feet vertically between the dissolved phase benzene and the foundation of existing or potential buildings	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Contains total TPH (TPH-g and TPH-d combined) < 100 mg/kg throughout the entire depth of the bioattenuation zone	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

(Vapor Intrusion Criteria a evaluation continued on next page)

(Media Specific Criteria for Vapor Intrusion to Indoor Air Evaluation continued on next page)

2. Media Specific Criteria: Petroleum Vapor Intrusion to Indoor Air: Does the site meet the LTCP criteria for petroleum vapor intrusion to indoor air?	☐ Yes ☐ No ☐ UND
Does the release site meet one of the three petroleum vapor intrusion to indoor air specific criteria listed below (a, b, or c)?	☐ Yes ☐ No ☐ UND



Scenario 4: Direct Measurement of Soil Gas Concentrations ☐ Yes ☐ No

Were appropriate soil gas sampling protocols followed? ☐ Yes ☐ No

Were soil gas samples obtained from the following locations? ☐ Yes ☐ No

Beneath or adjacent to an existing building: Soil gas samples collected at least 5 feet below the bottom of the building foundation	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Future construction: Soil gas samples from at least five feet below ground surface	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

Were soil gas samples collected in accordance with DTSC Advisory with DTSC Advisory – Active Soil Gas Investigations (April 2012)? ☐ Yes ☐ No

Are all of the following criteria for a bioattenuation zone satisfied? ☐ Yes ☐ No

There is a minimum of five vertical feet of soil between the soil vapor measurements and the foundation of an existing building or ground surface of future construction; and	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
TPH (TPHg + TPHd) is less than 100 mg/kg (measured in at least two depths within the five-foot zone; and	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Oxygen is ≥ 4% measured at the bottom of the five-foot zone	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA

If the bioattenuation zone criteria are all satisfied, then

Do soil gas concentrations meet the following criteria? ☐ Yes ☐ No

	Residential	Commercial
Constituent	**Soil Gas Concentration ($\mu g/m^3$)**	
Benzene	<85,000	<280,000
Ethylbenzene	<1,100,000	<3,600,000
Napthalene	<93,000	<310,000

If the bioattenuation zone criteria are not satisfied, then

Do soil gas concentrations meet the following criteria? ☐ Yes ☐ No

	Residential	Commercial
Constituent	**Soil Gas Concentration ($\mu g/m^3$)**	
Benzene	<85	<280
Ethylbenzene	<1,100	<3,600
Napthalene	<93	<310

*****End of Vapor Intrusion Criteria a evaluation *****

(Media Specific Criteria for Vapor Intrusion to Indoor Air Evaluation continued on next page)

2. **Media Specific Criteria: Petroleum Vapor Intrusion to Indoor Air**: Does the site meet the LTCP criteria for petroleum vapor intrusion to indoor air?	☐ Yes ☐ No ☐ UND
Does the release site meet one of the three petroleum vapor intrusion to indoor air specific criteria listed below (a, b, or c)?	☐ Yes ☐ No ☐ UND

CA LUFT Manual Guidance Statement:

Has pertinent information been provided in the CSM for compliance evaluation? (refer to General Criteria e for specific information) ☐ Yes ☐ No ☐ UND

*****End of Vapor Intrusion Criteria b evaluation section*****

(Media Specific Criteria for Vapor Intrusion to Indoor Air Evaluation continued on next page)

2. Media Specific Criteria: Petroleum Vapor Intrusion to Indoor Air: Does the site meet the LTCP criteria for petroleum vapor intrusion to indoor air?	☐ Yes ☐ No ☐ UND
Does the release site meet one of the three petroleum vapor intrusion to indoor air specific criteria listed below (a, b, or c)?	☐ Yes ☐ No ☐ UND
[redacted]	

CA LUFT Manual Guidance Statement:

Has pertinent information been provided in the CSM for compliance evaluation? (refer to General Criteria e for specific information) ☐ Yes ☐ No ☐ UND

*****End of Vapor Intrusion Criteria c evaluation section*****

(Media Specific Criteria for Vapor Intrusion to Indoor Air Evaluation continued on next page)

2. Media Specific Criteria: Petroleum Vapor Intrusion to Indoor Air: Does the site meet the LTCP criteria for petroleum vapor intrusion to indoor air?	☐ Yes ☐ No ☐ UND
Additional questions for sites that do not meet the LTCP criteria (a, b, or c)	

Indicate those conditions that do not meet the policy criteria:

Soil Gas Samples	☐ Insufficient number to be representative	☐ Not taken at two depths within 5 foot zone
	☐ Temporal variability not evaluated	☐ High spatial or temporal variability
	☐ No soil gas samples	☐ Insufficient analytes
	☐ Taken incorrectly	
Exposure Type	☐ Residential	☐ Commercial
Free Product	☐ In Groundwater	☐ In Soil
	☐ Unknown	
TPH in the Bioattenuation Zone	☐ ≥ 100 mg/kg	☐ Unknown
Bioattenuation Zone Thickness	☐ < 5 feet (No Biozone)	☐ ≥30 Feet
	☐ ≥5 feet and < 10 feet	☐ 30 Feet BioZone compromised
	☐ ≥10 feet and < 30 feet	☐ Unknown
Oxygen Data in Bioattenuation Zone	☐ No Oxygen Data	
	☐ Oxygen < 4%	☐ Oxygen ≥ 4%
Benzene in Groundwater	☐ ≥ 100 µg/L and < 1,000 µg/L	☐ Unknown
	☐ ≥ 1,000 µg/L	☐ ≥ 280,000 µg/m^3
Soil Gas Benzene	☐ ≥ 85 µg/m^3 and < 280 µg/m^3	☐ ≥ 85,000 µg/m^3 and < 280,000 µg/m^3
	☐ ≥ 280 µg/m^3 and < 85,000 µg/m^3	☐ Unknown
Soil Gas Ethylbenzene	☐ ≥ 1,100 µg/m^3 and < 3,600 µg/m^3	☐ ≥ 3,600,000 µg/m^3
	☐ ≥ 3,600 µg/m^3 and < 1,100,000 µg/m^3	☐ Unknown
	☐ ≥ 1,100,000 µg/m^3 and < 3,600,000	
Soil Gas Napthalene	☐ ≥ 93 µg/m^3 and < 310 µg/m^3	☐ ≥ 310,000 µg/m^3
	☐ ≥ 310 µg/m^3 and < 93,000 µg/m^3	☐ Unknown
	☐ ≥ 93,000 µg/m^3 and < 310,000 µg/m^3	

End of Evaluation of Media Specific Criteria: Petroleum Vapor Intrusion to Indoor Air

3. **Media-Specific Criteria: Direct Contact and Outdoor Air Exposure** - Does the site meet satisfy the media-specific criteria for direct contact and outdoor air exposure (a, b, or c)?	☐ Yes ☒ No ☐ UND
LTCP Statement: "This policy describes conditions where direct contact with contaminated soil or inhalation of contaminants volatized to outdoor air poses a low threat to human health. Release sites where human exposure may occur satisfy the media-specific criteria for direct contact and outdoor air exposure and shall be considered low-threat if they meet any of the following (a, b, or c, below)."	
CA LUFT Manual Guidance Statement: "If a site does not meet the media-specific criteria for direct contact and outdoor air exposure, then a medium-specific analysis may need to be performed to demonstrate that the medium and its associated exposure pathways are low-threat. For an evaluation of direct contact and volatilization to outdoor air, calculate a more reasonable exposure concentration by averaging the measured concentration over an appropriate (conservative) exposure area. The Case Closure Policy indicates that the maximum concentrations should be used in this analysis, so be sure to include the maximum values when calculating the average. For a residential exposure, a reasonable exposure area may correspond to the size of a small backyard."	
Exemption – Is the upper 10 feet of soil free of petroleum contamination?	☐ Yes ☒ No ☐ UND
LTCP Statement:	
CA LUFT Manual Guidance:	
Has pertinent information been provided in the CSM for compliance evaluation? (refer to General Criteria e for specific information) ☐ Yes ☒ No ☐ UND	
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 ☒ UND
LTCP Statement: "Maximum concentrations of petroleum constituents in soil are less than or equal to those listed in Table 1 for the specified depth below ground surface (bgs). The concentration limits for 0 to 5 feet bgs protect from ingestion of soil, dermal contact with soil, and inhalation of volatile soil emissions and inhalation of particulate emissions. The 5 to 10 feet bgs concentration limits protect from inhalation of volatile soil emissions. Both the 0 to 5 feet bgs concentration limits and the 5 to 10 feet bgs concentration limits for the appropriate site classification (Residential or Commercial/Industrial) shall be satisfied. In addition, if exposure to construction workers or utility trench workers is reasonably anticipated, the concentration limits for Utility Worker shall also be satisfied."	

(Criteria a evaluation continued on next page)

(Media Specific Criteria for Direct Contact and Outdoor Air Evaluation continued on next page)

3. **Media-Specific Criteria: Direct Contact and Outdoor Air Exposure** - Does the site meet satisfy the media-specific criteria for direct contact and outdoor air exposure? (continued)	☐ Yes ☑ No ☐ UND
a. Are maximum concentrations of petroleum constituents in soil less than or equal to those listed in Table 1 for the specified depth bgs? (continued)	☐ Yes ☐ No ☐ UND

Table 1 – Concentrations of Petroleum Constituents in Soil That will Have No Significant Risk of Adversely Affecting Human Health

	Residential		Commercial/Industrial		Utility Worker
Chemical	0 to 5 ft bgs (mg/kg)	5 to 10 ft bgs (mg/kg)	0 to 5 ft bgs (mg/kg)	5 to 10 ft bgs (mg/kg)	0 to 10 ft bgs (mg/kg)
Benzene	1.9	2.8	8.2	12	14
Max Soil Conc[1]	*Insert*	*Insert*	*Insert*	*Insert*	*Insert*
Ethylbenzene	21	32	89	134	314
Max Soil Conc[1]	*Insert*	*Insert*	*Insert*	*Insert*	*Insert*
Napthalene	9.7	9.7	45	45	219
Max Soil Conc[1]	*Insert*	*Insert*	*Insert*	*Insert*	*Insert*
PAH	0.063	NA	0.68	NA	4.5
Max Soil Conc[1]	*Insert*	*Insert*	*Insert*	*Insert*	*Insert*

Notes:

1. The maximum concentrations of petroleum constituents in soil should be compared to those listed in Table 1 (Technical Justification for Soil Screening Levels for Direct Contact and Outdoor Air Exposure Pathways, SWRCB)
2. Based on the seven carcinogenic poly-aromatic hydrocarbons (PAHs) as benzo(a)pyrene toxicity equivalent [BaPe]. Sampling and analysis for PAHs is only necessary where soil is affected by either waste oil or Bunker C oil.

Are both the 0 to 5 feet bgs concentration limits 5 to 10 feet bgs concentration limits for the appropriate site classification satisfied?	☐ Yes ☐ No ☑ UND
Residential:	☐ Yes ☐ No ☑ UND
Commercial/Industrial:	☐ Yes ☐ No ☑ UND

If exposure to construction or utility trench workers is reasonably anticipated, are the concentration limits for the Utility Worker satisfied?	☐ Yes ☐ No ☑ UND

Have the requirements for using the screening levels in Table 1 been satisfied (i.e., have the model assumptions presented in the SWRCB document entitled *"Technical Justification for Soil Screening Levels for Direct Contact and Outdoor Air Exposure Pathways"* been met?	☐ Yes ☐ No ☑ UND
Is the area of impacted soil where a particular exposure occurs ≤ 82 feet by 82 feet?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Is the receptor located at the downgradient edge for inhalation exposure?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Is the wind speed < 2.25 meters per second (7.38 feet per second) on average?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
Are there different exposure scenarios than residential, commercial/industrial, utility worker) at the site?	☐ Yes ☐ No ☐ UND ☐ NE ☐ NA
If no, then is a site-specific risk analysis warranted?	☐ Yes ☐ No ☐ UND

Has pertinent information been provided in the CSM for compliance evaluation? (refer to General Criteria e for specific information)	☐ Yes ☑ No ☐ UND

*****End of Criteria a evaluation*****

(Media Specific Criteria for Direct Contact and Outdoor Air Evaluation continued on next page)

3. Media-Specific Criteria: Direct Contact and Outdoor Air Exposure - Does the site meet satisfy the media-specific criteria for direct contact and outdoor air exposure? (continued)	☐ Yes ☑ No ☐ UND
b. Are maximum concentrations of petroleum constituents in soil less than or equal to those listed in Table 1 for the specified depth bgs? (continued)	☐ Yes ☐ No ☑ UND
Has pertinent information been provided in the CSM for compliance evaluation? (refer to General Criteria e for specific information) ☐ Yes ☐ No ☐ UND *****End of Criteria b evalaution*****	
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 ☑ UND
Guidance Document: Institutional Controls A Guide to Planning Implementing Maintaining and Enforcing Institutional Controls at Contaminated Sites, Interim Final. USEPA Nov 2010 540-R-09-001 EPA defines institutional controls as non-engineered instruments, such as administrative and legal controls, that help to minimize the potential for human health exposure to contamination and/or protect the integrity of a response action. ICs are typically designed to work by limiting land or resource use or by providing information that helps modify or guide human behavior at a site.	
Has pertinent information been provided in the CSM for compliance evaluation? (refer to General Criteria e for specific information) ☐ Yes ☑ No ☐ UND	
*****End of Criteria c evaluation***** **(Media Specific Criteria for Direct Contact and Outdoor Air Evaluation continued on next page)**	

3. **Media-Specific Criteria: Direct Contact and Outdoor Air Exposure** - Does the site meet satisfy the media-specific criteria for direct contact and outdoor air exposure? (continued)	☐ Yes ☐ No ☐ UND
Additional questions if the site does not meet any of the Direct Contact and Outdoor Air Exposure scenarios	

Indicate only those conditions that do not meet the policy:

Exposure Type:	☐ Residential	☐ Utility Worker
	☐ Commercial	
Petroleum Constituents in Soil:	☐ ≤ 5 feet bgs	☑ Unknown
	☐ > 5 feet bgs and ≤ 10 feet bgs	☐ > 12 mg/kg and ≤ 14 mg/kg
Soil Concentrations of Benzene:	☐ > 1.9 mg/kg and ≤ 2.8 mg/kg	☐ > 14 mg/kg
	☐ > 2.8 mg/kg and ≤ 8.2 mg/kg	☑ Unknown
	☐ > 8.2 mg/kg and ≤ 12 mg/kg	
Soil Concentrations of Ethylbenzene:	☐ > 21 mg/kg and ≤ 32 mg/kg	☐ > 134 mg/kg and ≤ 314 mg/kg
	☐ > 32 mg/kg and ≤ 89 mg/kg	☐ > 314 mg/kg
	☐ > 89 mg/kg and ≤ 134 mg/kg	☑ Unknown
Soil Concentrations of Naphthalene:	☐ > 9.7 mg/kg and ≤ 45 mg/kg	☐ > 219 mg/kg
	☐ > 45 mg/kg and ≤ 219 mg/kg	☑ Unknown
Soil Concentrations of PAH:	☐ > 0.063 mg/kg and ≤ 0.68 mg/kg	☐ > 4.5 mg/kg
	☐ > 0.68 mg/kg and ≤ 4.5 mg/kg	☑ Unknown
Area of Impacted Soil:	☐ Area of Impacted Soil > 82 by 82 Feet	☑ Unknown

This case should be closed in spite of not meeting policy criteria ☐ Yes ☑ No

Explanation:

***** End of Media Specific Criteria: Direct Contact and Outdoor Air Exposure Evaluation*****

LOW THREAT UST CASE CLOSURE POLICY COMPLIANCE AND IDENTIFICATION OF IMPEDIMENTS TO CASE CLOSURE CHECKLIST
ALAMEDA COUNTY ENVIRONMENTAL HEALTH LOCAL OVERSIGHT PROGRAM

Low-Threat Case Closure Notification Requirements - Has the regulatory agency recommending closure complied with the Low Threat Closure Policy public notification requirements? ☐ Yes ☑ No ☐ UNK

LTCP Statement: "Cases that meet the general and media-specific criteria established in this policy pose a low threat to human health, safety and the environment and satisfy the case-closure requirements of Health and Safety Code section 25296.10, and case closure is consistent with State Water Board Resolution 92-49 that requires that cleanup goals and objectives be met within a reasonable time frame. If the case has been determined by the regulatory agency to meet the criteria in this policy, the regulatory agency shall notify responsible parties that they are eligible for case closure and that the following items, if applicable, shall be completed prior to the issuance of a uniform closure letter specified in Health and Safety Code section 25296.10. After completion of these items, and unless the regulatory agency revises its determination based on comments received on the proposed case closure, the regulatory agency shall issue a uniform closure letter within 30 days from the end of the comment period.

Municipal and county water districts, water replenishment districts, special act districts with groundwater management authority, agencies with authority to issue building permits for land affected by the petroleum release, owners and occupants of the property impacted by the petroleum release, and the owners and occupants of all parcels adjacent to the impacted property shall be notified of the proposed case closure and provided a 60 day period to comment. The regulatory agency shall consider any comments received when determining if the case should be closed or if site specific conditions warrant otherwise.

Municipal and county water districts, water replenishment districts, special act districts with groundwater management authority, agencies with authority to issue building permits for land affected by the petroleum release, owners and occupants of the property impacted by the petroleum release, and the owners and occupants of all parcels adjacent to the impacted property shall be notified of the proposed case closure and provided a 60 day period to comment. The regulatory agency shall consider any comments received when determining if the case should be closed or if site specific conditions warrant otherwise."

Name of the Regulatory Agency Making Recommendation for Case Closure:

☐ Alameda County Environmental Health	☐ Regional Water Quality Control Board
☑ Underground Storage Tank Cleanup Fund	☐ State Water Resources Control Board

Does ACEH Concur with Closure Recommendation? ☐ Yes ☑ No

Have the appropriate parties been notified of the proposed closure? Yes ☑ No ☐ UNK
closure and provided a 60 day period to comment?

Municipal and County Water Districts? ☐ Yes ☐ No ☑ UNK

☐ EBMUD	☐ Zone 7	☐ City of Hayward

Water Replenishment Districts? ☐ Yes ☐ No ☐ UNK

☐ EBMUD	☐ Zone 7	

Agencies with authority to issue building permits for land affected by the petroleum? ☐ Yes ☐ No ☑ UNK

County: ☐ Alameda County

City:

☐ Alameda	☐ Dublin	☐ Hayward	☑ Piedmont
☐ Albany	☐ Emeryville	☐ Livermore	☐ Pleasanton
☐ Alameda		☐ Oakland	☐ San Leandro

Owners and Occupants of all parcels adjacent to the impacted property? ☐ Yes ☐ No ☑ UNK

Owners:	☐ Yes	☐ No	☑ UNK	Occupants:	☐ Yes ☑ No ☐ UNK

(Low Threat Notification Requirements Evaluation Section continued on next page)

LOW THREAT UST CASE CLOSURE POLICY COMPLIANCE AND IDENTIFICATION OF IMPEDIMENTS TO CASE CLOSURE CHECKLIST
ALAMEDA COUNTY ENVIRONMENTAL HEALTH LOCAL OVERSIGHT PROGRAM

Low-Threat Case Closure Notification Requirements - Has the regulatory agency recommending closure complied with the Low Threat Closure Policy public notification requirements? (continued)	☐ Yes ☑ No ☐ UND

Has the regulatory agency given public notice to other affected parties or potentially affected parties beside the owners and occupants of adjacent parcels in compliance with the public participation requirements of Chapter 16 of Division 3 of Title 23 of the California Code of Regulations and Chapter 6.7 of Division 20 if the Health and Safety Code? ☐ Yes ☑ No ☐ UNK

Owners: ☐ Yes ☑ No ☐ UNK	Occupants: ☐ Yes ☑ No ☐ UNK

Has public participation been conducted in accordance with the SWRCB and Regional Water Quality Control Boards April 2005 guidance document entitled "*Final Draft Public Participation at Cleanup Sites*"? ☐ Yes ☑ No ☐ UNK

Guidance Statement: The level of public participation effort at a particular site should be based on the site's threat (to human health, water quality, and the environment), the degree of public concern or interest in site cleanup, and any environmental justice factors associated with the site. There may be more public concern or interest about a site when: contaminants have migrated or are likely to migrate off site, cleanup could generate dust and noise, or cleanup is linked to redevelopment of the property.

Category 1 Public Participation Requirements

Guidance Statement: Category 1 includes most leaking underground fuel tank (LUFT) sites and many small commercial facilities. Category 1 sites are characterized by soil or groundwater contamination that does not pose an immediate human health threat and does not extend off-site onto neighboring properties. Off-site groundwater plumes that extend only into the public right of way are also included in this category.

Have surrounding property owners and residents within an appropriate distance of the site been notified (e.g., 200 foot radius in an urban setting, 1,000 foot in a rural setting per the April 2005 document)? (The term "site" refers to the full extent of known contamination)	☐ Yes ☐ No ☑ UNK
Have other interested parties or groups, including other public agencies and environmental and community groups been notified?	☐ Yes ☑ No ☐ UNK

Category 2 Public Participation Requirements

Guidance Statement: Category 2 includes larger industrial or commercial sites with significant soil and groundwater contamination. At these sites, the groundwater plume extends off-site beyond the public right of way (or is assumed to extend off-site until investigation shows otherwise.) This category includes many solvent sites. A few LUFT sites will fall into this category. This category also includes California Land Reuse and Revitalization Act (CLRRA) sites, where a buyer or landowner has applied for liability relief pursuant to this Brownsfield legislation.

Have all property owners and residents affected, or potentially affected by offsite migration of the plume been notified?	☐ Yes ☑ No ☐ UNK

*****End of Low-Threat Case Closure Notification Requirements Evaluation*****

LOW THREAT UST CASE CLOSURE POLICY COMPLIANCE AND IDENTIFICATION OF IMPEDIMENTS TO CASE CLOSURE CHECKLIST
ALAMEDA COUNTY ENVIRONMENTAL HEALTH LOCAL OVERSIGHT PROGRAM

Low-Threat Case Closure Monitoring Well Destruction and Waste Removal Requirements - Have all wells and borings installed for the purpose of investigating, remediating, or monitoring the unauthorized release been properly destroyed?	☐ Yes ☑ No ☐ UND
Have all monitoring wells and borings been properly destroyed?	☐ Yes ☑ No ☐ UND
LTCP Statement: "All wells and borings installed for the purpose of investigating, remediating, or monitoring the unauthorized release shall be properly destroyed prior to case closure unless a property owner certifies that they will keep and maintain the wells or borings in accordance with applicable local or state requirements."	
If all wells and borings have not been properly destroyed, then	
Has the property owner certified that they will keep and maintain the wells or borings in accordance with applicable local or state requirements? ☐ Yes ☐ No ☐ UNK	
Has pertinent information been provided in the CSM for compliance evaluation? (refer to General Criteria e for specific information) ☐ Yes ☐ No	
End of Monitoring Well Destruction Requirements Evaluation	
Have all waste piles, drums, debris, and other investigation or remediation derived materials been removed from the site and properly managed in accordance with regulatory agency requirements?	☐ Yes ☐ No ☐ UND
Policy Statement: All waste piles, drums, debris and other investigation or remediation derived materials shall be removed from the site and properly managed in accordance with regulatory agency requirements.	
Has pertinent information been provided in the CSM for compliance evaluation? (refer to General Criteria e for specific information) ☐ Yes ☐ No	
End of Waste Removal Requirements Evaluation	
End of Low Threat Closure Policy and Impediment Identification Checklist	