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

Agency Name : Alameda County Environmental Health	Date: March 12, 2013
Case Worker: Mark Detterman	Fuel Leak Case No: RO0000454
Site Name: Chevron #20-6145	GeoTracker Global ID: T0600102230
Site Address: 800 Center Street, Oakland, CA	USTCF Claim No: 12265

Alameda County Environmental Health (ACEH) has reviewed the above listed site for consideration of case closure using the framework provided by the State Water Resources Control Board (SWRCB) Low-Threat Underground Storage Tank Case Closure Policy (LTCP), adopted on May 1, 2012, and effective August 17, 2012. The results of ACEH's case review indicates that the site ☐ PASSES ☒ FAILS the LTCP criteria.

Section 25296.10 of the California Health and Safety Code (H&SC) requires that sites be cleaned up to protect human health, safety, and the environment. The current conceptual site model ☐ is ☐ 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. A complete record of the case files (i.e., regulatory directives and correspondence, reports, data submitted in electronic deliverable format [EDF], 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.

Application of Case Review Tools

ACEH's case closure evaluation was guided by the application of the principles and strategies presented in the *Leaking Underground Fuel Tank Guidance Manual* (CA LUFT Manual), dated September 2012. This guidance document was developed by the SWRCB "…[t]o provide guidance for implementing the requirements established by the Case Closure Policy" 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 simplification of the SWRCB checklist 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 this site and is presented in the subsequent pages of this document.

General Criteria a: **Is the Unauthorized Release Located within the Service Area of a Public Water System?**	☒ YES	☐ NO	☐ NE

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."

Does the public water system have 15 or more service connection or regularly serves at least 25 individuals daily at least 60 days of the year?	☒ **Yes**	☐ **No**	
Name of public water system agency?			

East Bay Municipal Utility District	☒ Yes
Zone 7 Water Agency	☐ Yes
City of Hayward Water	☐ Yes
Alameda County Water District	☐ Yes

Has the minimum required information listed below been provided in the CSM for evaluation of case compliance with General Criteria a?	☒ **Yes**	☐ **No**	
Has confirmation that the property has a hook-up and uses the public water system been provided?	☐ Yes	☐ NE	☒ NA
Has a well search been conducted to identify wells located within 2,000 feet of the site?	☒ Yes	☐ NE	☐ NA
Are there existing water supply wells or other sources of water in the vicinity of the site?	☒ Yes	☐ NE	☐ NA
Are existing supply wells or other sources of water used by property owners/tenants in the vicinity of the site?	☐ Yes	☒ NE	☐ NA
Have existing supply wells or other sources of water been sampled for chemicals of concern associated with the release site?	☐ Yes	☐ NE	☒ NA
Have existing supply wells or other sources of water been properly abandoned and well destruction records been provided?	☐ Yes	☐ NE	☒ NA

Domestic Water Supply Wells	☐ Yes	☐ No	☐ NA
Irrigation Wells	☐ Yes	☐ No	☐ NA
Other Capture Systems	☐ Yes	☐ No	☐ NA

(Refer to Att. 1 - CSM Detailed Evaluation Checklist for Identification of Data Gaps)

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

Case Notes

Four existing water supply wells are located within 1,250 feet of the site. All are crossgradient or upgradient, and are therefore not considered sensitive receptors or conduits.

*****End of General Criteria a Evaluation*****

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

General Criteria b: Does the Unauthorized Release Consist only of Petroleum?	☐ YES	☒ NO	☐ NE

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."

Site Contaminants Dectected in Soil, Soil Gas, Groundwater, and Surface Water						
Petroleum				☒ **Yes**	☐ **No**	☐ **NE**
Motor fuels	☒ Yes	☐ No	☐ NE			
TPH middle distillates	☒ Yes	☐ No	☐ NE			
Residual fuels	☒ Yes	☐ No	☐ NE			
Fuel oxygenates	☒ Yes	☐ No	☐ NE			
Lead scavengers	☐ Yes	☐ No	☐ NE			
Aromatic compounds	☐ Yes	☐ No	☐ NE			
TPH middle distillates	☐ Yes	☐ No	☐ NE			
Non Petroleum Contaminants				☒ **Yes**	☐ **No**	☐ **NE**
VOCs	☐ Yes	☐ No	☐ NE			
SVOCs	☐ Yes	☐ No	☐ NE			
Dioxans & Furans	☐ Yes	☐ No	☐ NE			
Other PAHs	☐ Yes	☐ No	☐ NE			
PCBs	☐ Yes	☐ No	☐ NE			
Phenols	☐ Yes	☐ No	☐ NE			
Metals	☒ Yes	☐ No	☐ NE			

Has the minimum required information listed below been provided in the CSM for evaluation of case compliance with General Criteria b?	☒ **Yes**	☐ **No**	
Description of the site history?	☒ Yes	☐ No	☐ NA
Types of products or chemicals used at the site?	☒ Yes	☐ No	☐ NA
History of types of releases other than petroleum?	☒ Yes	☐ No	☐ NA
Presentation of sampling results for all chemicals other than petroleum such as volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), phenol, 1,4-dioxane, dibenzofurans, or dioxins?	☒ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA

(Refer to Att. 1 - CSM Detailed Evaluation Checklist for Identification of Data Gaps)

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

Case Notes

Near surface soil has been sampled for total lead, PCBs, and organochlorine pesticides. Concentrations up to 5,760 mg/kg total lead were detected. PCB was present above the DTSC screening level at one location. Concentrations of Aldrin, Gamma BHC Lindane, Alpha Chlordane, Gamma Chlordane, DDD, DDE, DDT, and Dieldrin were detected above residential direct exposure ESLs, but below DTSC Screening Levels. Because Chevron owns (as of May 2012) all three parcels associated with the case, Chevron remains a Responsible Party for contamination on each parcel.

*****End of General Criteria b Evaluation*****

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

General Criteria c: **Has the Unauthorized ("Primary") Release from the UST System been Stopped?**	☒ **YES**	☐ **NO**	☐ **NE**

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."

Have the tank(s), piping, dispenser islands, or other appurtenant structures that released petroleum into the environment been removed, repaired or replaced?	☒ Yes	☐ No	☐ NE
Tanks?	☒ Yes	☐ No	☐ NE
Product piping?	☒ Yes	☐ No	☐ NE
Dispenser islands?	☒ Yes	☐ No	☐ NE
Other structures?	☒ Yes	☐ No	☐ NE
Have the tanks, piping, and/or dispenser islands been moved to a different location at the site?	☐ Yes	☒ No	☐ NE
Were/are the tanks permitted by a local regulatory agency having jurisdiction over USTs?	☐ Yes	☐ No	☒ NE
Have the operating records been reviewed (i.e., operating permit, types of products dispensed, tanks construction, tank capacity, tank tightness tests, etc)?	☐ Yes	☐ No	☐ NE
Was a tank removal permit issued by the local regulatory agency?	☐ Yes	☐ No	☐ NE
Was a tank removal report submitted?	☐ Yes	☐ No	☐ NE
Is there indication that new release(s) have occurred subsequent to the initial release?	☐ Yes	☒ No	☐ NE
Are there spikes or increasing concentration trends in historic data subsequent to the initial release?	☐ Yes	☐ No	☐ NE
Are there new detections of free product subsequent to the initial release in historic data?	☐ Yes	☐ No	☐ NE
Have new contaminants been detected in historic data subsequent to the initial release?	☐ Yes	☐ No	☐ NE
Have new petroleum hydrocarbons or other hazardous products been dispensed of at the site since the initial release occurred?	☐ Yes	☒ No	☐ NE
Is there indication of new impacts from offsite sources?	☐ Yes	☒ No	☐ NE

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

CSM Minimum Requirements

Has the minimum required information listed below been provided in the CSM for evaluation of case compliance with General Criteria c?	☒ **Yes**	☐ **No**	
Description of the history of releases and the actions taken to stop each release?	☒ Yes	☐ No	☐ NA
Evaluation and accounting for changing contaminant concentrations over the full time period of site investigations?	☒ Yes	☐ No	☐ NA
Data from other sites in the vicinity with unauthorized releases of petroleum hydrocarbons or other hazardous materials	☒ Yes	☐ No	☐ NA
Hazardous Materials Business Plans (historic and current)	☐ Yes	☐ No	☒ NA
CUPA UST permits and inspection reports	☐ Yes	☐ No	☒ NA

(Refer to Att. 1 - CSM Detailed Evaluation Checklist for Identification of Data Gaps)

Case Notes:

*****End of General Criteria c Evaluation*****

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

General Criteria d: **Has Free Product been Removed to the Maximum Extent Practicable?**	☒ **YES**	☐ **NO**	☐ **NE**	☐ **NA**

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."

Has the minimum required information listed below been provided in the CSM for evaluation of case compliance with General Criteria d?	☒ **Yes**	☐ **No**	
Has the presence of free product been evaluated?	☒ Yes	☐ No	☐ NA
Has a description of investigation and monitoring activities that have been undertaken to assess whether free product is present been provided?	☒ Yes	☐ No	☐ 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	☐ NA
Has tabulation and an evaluation of historic groundwater levels and flow direction and identification of a smear zone been provided?	☒ Yes	☐ No	☐ NA
Has data including tables and figures showing any observation and measurements of free product been provided?	☒ Yes	☐ No	☐ NA
Has an evaluation of the adequacy of the monitoring well network and appropriateness of screen interval to detect free product been conducted?	☒ Yes	☐ No	☐ NA
Has an evaluation of whether free product removal is practicable, or if not practicable, a description of the conditions that prevent free product removal been conducted?	☒	☐	☐
Has free product removal been implemented?	☐ Yes	☐ No	☒ NA
Has a description of corrective action(s) that were taken to remove product, dates of removal actions, and volumes removed been provided?	☐ Yes	☐ No	☒ NA
Is free product removal still being conducted?	☐ Yes	☐ No	☒ NA
Does data indicate rebound of free product subsequent to product removal?	☐ Yes	☐ No	☒ NA

Absorbent Materials	☐ Yes	☐ No
Bailing	☐ Yes	☐ No
Skimmer	☐ Yes	☐ No
HVDPE	☐ Yes	☐ No
Other Methods:	☐ Yes	☐ No

(Refer to Att. 1 - CSM Detailed Evaluation Checklist for Identification of Data Gaps)

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

Case Notes

End of General Criteria d Evaluation

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

General Criteria e: **Has a Conceptual Site Model that Adequately Assesses the Nature, Extent, and Mobility of the Release been Developed?**	☒ **YES**	☐ **NO**	☐ **NE**

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."

Has a CSM that adequately assesses the nature, extent, and mobility of the release in affected media in the vicinity of the site been developed?	☒ Yes	☐ No	
Groundwater assessment?	☒ Yes	☐ No	☐ NA
Surface water assessment?	☒ Yes	☐ No	☐ NA
Soil assessment?	☒ Yes	☐ No	☐ NA
Soil vapor assessment?	☒ Yes	☐ No	☐ NA
Indoor Air assessment?	☐ Yes	☐ No	☒ NA
Has the CSM been developed in accordance with industry standards?	☒ Yes	☐ No	☐ NA
SWRCB CA LUFT Manual, September 2012	☐ Yes	☐ No	☐ NA
ITRC Vapor Intrusion Pathway: A Practical Guideline (ITRC 2007)	☐ Yes	☐ No	☐ NA
ASTM Method 1689-95 - Standard Guide for Developing Conceptual Site Models for Contaminated Sites	☐ Yes	☐ No	☐ NA
ASTM Method 2531-6 - Standard Guide for Development of Conceptual Models for Light Nonaqueous-Phase Liquids Released to the Subsurface	☐ Yes	☐ No	☐ NA
DTSC Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (October 2011)	☐ Yes	☐ No	☐ NA
Is the CSM presented in one comprehensive document or has a summary document been submitted that identifies the documents where the requisite CSM elements are located?	☒ Yes	☐ No	☐ NA
Is the CSM representative of current site conditions?	☒ Yes	☐ No	☐ NA
Does the final closure review validate the CSM?	☒ Yes	☐ No	☐ NA

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

Case Notes

Has the minimum required information listed below been provided in the CSM for evaluation of case compliance with General Criteria e?	☒ **Yes**	☐ **No**	
Site history?	☒ Yes	☐ No	☐ NA
Receptor survey?	☒ Yes	☐ No	☐ NA
Description of releases?	☒ Yes	☐ No	☐ NA
Geologic and hydrogeologic assessment?	☒ Yes	☐ No	☐ NA
Identified stratigraphic and manmade migration pathways?	☒ Yes	☐ No	☐ NA
Identified controls on contaminant migration?	☒ Yes	☐ No	☐ NA
Delineation of the lateral and vertical extent of contamination in all affected media?	☒ Yes	☐ No	☐ NA
Assessment of vapor intrusion pathways?	☒ Yes	☐ No	☐ NA
Groundwater monitoring and evaluation of plume stability?	☒ Yes	☐ No	☐ NA
Description of the type and effectiveness of corrective actions?	☒ Yes	☐ No	☐ NA
Identification of data gaps?	☒ Yes	☐ No	☐ NA

(Refer to Att. 1 - CSM Detailed Evaluation Checklist for Identification of Data Gaps)

Case Notes:

The CSM validated the identified data gaps.

*****End of General Criteria e Evaluation*****

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

General Criteria f: **Has Secondary Source been Removed to the Extent Practicable?**	☐ **YES**	☒ **NO**	☐ **NE**

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."

Has secondary source been removed to the extent practicable?	☐ Yes	☒ No	☐ NE
Petroleum-impacted soil?	☐ Yes	☒ No	☐ NE
Petroleum-impacted groundwater?	☐ Yes	☐ No	☐ NE
Is corrective action currently in progress to remove or destroy-in-place the most readily recoverable fraction of source-area mass?	☐ Yes	☒ No	☐ NE
Petroleum-impacted soil remediation?	☐ Yes	☒ No	☐
Petroleum-impacted groundwater remediation?	☐ Yes	☒ No	☐
Have the current site remediation efforts been in progress for more than one year?	☐ Yes	☒ No	☐
Petroleum-impacted soil?	☐ Yes	☐ No	
Petroleum-impacted groundwater?	☐ Yes	☐ No	
Is site remediation cost effective?	☐ Yes	☐ No	☒ NE
Is site remediation progressing adequately?	☐ Yes	☐ No	☒ NE
Are additional removal or active remedial actions necessary to remove or abate a demonstrated threat to human health?	☒ Yes	☐ No	☐ NE
Petroleum-impacted soil?	☒ Yes	☐ No	☐ NE
Petroleum-impacted groundwater?	☐ Yes	☐ No	☐ NE

Has the minimum required information listed below been provided in the CSM for evaluation of case compliance with General Criteria f?	☒ **Yes**	☐ **No**	
History of corrective actions for the site including the types of cleanup actions taken, dates of the actions, and mass removed?	☒ Yes	☐ No	☐ NA
Figures depicting the location(s) of the removal action?	☒ Yes	☐ No	☐ NA
Confirmation sampling results which demonstrate the effectiveness of secondary source removal?	☒ Yes	☐ No	☐ NA
Narrative description of the actions and areas of success or infeasibility of actions?	☒ Yes	☐ No	☐ NA
For in-situ corrective actions, presentation of long-term monitoring data that demonstrate that concentration have not rebounded following the cessation of corrective action?	☒ Yes	☐ No	☐ NA

(Refer to Att. 1 - CSM Detailed Evaluation Checklist for Identification of Data Gaps)

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

Case Notes

Significant residual petroleum hydrocarbons remain in soil at the site (up to 3,400 mg/kg TPHd, 18,000 mg/kg TPHg, 92 mg/kg benzene, 440 mg/kg ethylbenzene, and uncharacterized naphthalene and PAHs). Residual contamination is predominately located between 5 and 10 feet below grade surface, extends to at least 16 feet bgs, but is undefined vertically in a central residual soil contamination core zone (but appears defined vertically outside the core zone). An approved Low-Flow Air Sparge pilot test has successfully mobilized residual contamination at the site and increased concentrations in groundwater an order of magnitude; however, a collection system (such as vapor extraction) has not been installed at the site. The remediation system appears to have been partially successful, stopped prematurely, and additional remedial actions appear appropriate.

*****End of General Criteria f Evaluation*****

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

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**	☐ **NE**

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."

Has the minimum required information listed below been provided in the CSM for evaluation of case compliance with General Criteria g?	☒ **Yes**	☐ **No**	
Presentation of sufficient data to assess whether MTBE is or was present in soil at or in the vicinity of the site?	☒ Yes	☐ No	☐ NE
Presentation of sufficient data to assess whether MTBE is or was present in groundwater at or in the vicinity of the site?	☒ Yes	☐ No	☐ NE

(Refer to Att. 1 - CSM Detailed Evaluation Checklist for Identification of Data Gaps)

Case Notes:

*****End of General Criteria g Evaluation*****

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

General Criteria h: **Does a Nuisance as Defined by Water Code Section 13050 Exist at the Site?**	☐ **YES**	☒ **NO**	☐ **NE**

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."

Does a nuisance condition currently exist (or potentially could exist) as defined by the LTCP above?	☐ **Yes**	☒ **No**	☐ **NE**
Is injurious to health?	☐ Yes	☐ No	☐ NE
Is indecent or offensive to the senses?	☐ Yes	☐ No	☐ NE
Is an obstruction to the free use of property so as to interfere with the comfortable enjoyment of life or property?	☐ Yes	☐ No	☐ NE
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	☐ NE
Is a result of the treatment or disposal of waste?	☐ Yes	☐ No	☐ NE

Has the minimum required information listed below been provided in the CSM for evaluation of case compliance with General Criteria h?	☒ **Yes**	☐ **No**	
Description of whether site contamination is present in locations that have the potential to pose nuisance conditions during common or reasonably expected site activities?	☒ Yes	☐ No	☐ NA
Descriptions of the type and vertical and lateral extent of shallow soil?	☒ Yes	☐ No	☐ NE
Descriptions of the lateral extent of surface soil contamination, and depths to contamination?	☒ Yes	☐ No	☐ NE
Presentation of analytical results for surface soil, shallow soil, soil gas, groundwater, and surface water samples?	☒ Yes	☐ No	☐ NE
Discussion of odors or visual evidence of contamination?	☒ Yes	☐ No	☐ NE
Presentation of preferential pathway and utility conduit surveys?	☒ Yes	☐ No	☐ NE
Evaluation of potential points for exposure such as groundwater or free product seeps into basements or surface water bodies or conveyances?	☐ Yes	☒ No	☐ NE
Description of surface water runoff from the property to storm drains, other sites, or other surface water body receptors?	☐ Yes	☒ No	☐ NE
Description of the current and expected future use of the site and impacted or potentially impacted property in the site vicinity?	☐ Yes	☒ No	☐ NE

Surface soils?	☒ Yes	☐ No	☐ NE
Near surface soils?	☒ Yes	☐ No	☐ NE
Utility corridors?	☒ Yes	☐ No	☐ NE
Groundwater?	☒ Yes	☐ No	☐ NE
Surface water?	☒ Yes	☐ No	☐ NE
Soil gas?	☒ Yes	☐ No	☐ NE
Basements or other subsurface structures?	☒ Yes	☐ No	☐ NE

(Refer to Att. 1 - CSM Detailed Evaluation Checklist for Identification of Data Gaps)

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

Case Notes

Recent plans for the subject site were for redevelopment as residential property. Because residual contamination is in the 5 to 10 foot depth interval, nuisance issues were not anticipated with the previously planned at-grade redevelopment; however, should redevelopment include a subgrade feature this General Criteria would require re-evaluation.

*****End of General Criteria h Evaluation*****

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

Does the site meet the LTCP criteria for groundwater, <u>or</u> does the site qualify for the Soil Only Case exemption?	☒ **YES**	☐ **NO**

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."

"Sites with Releases that Have Not Affected Groundwater - 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."

Does the site qualify for the Soil Only Case EXEMPTION?	☐ **Yes**	☒ **No**
If the site <u>does not</u> qualify for the soil only exemption, then, is the contaminant plume stable or decreasing in areal extent?	☒ **Yes**	☐ **No**
If the contaminant plume is stable or decreasing, then does it meet <u>all of the additional characteristics</u> of one of the five (5) LTCP classes?	☒ **Yes**	☐ **No**

Class 1	☒ **Yes**	☐ **No**
Class 2	☐ **Yes**	☐ **No**
Class 3	☐ **Yes**	☐ **No**
Class 4	☐ **Yes**	☐ **No**
Class 5	☐ **Yes**	☐ **No**

(Refer to Next Page for Contaminant Plume Classification Characteristics)

(Media Specific Criteria for Groundwater Evaluation Continued on Next Page)

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

Groundwater Contaminant Plume Classification Characteristics

If the Contaminant Plume is Stable or Decreasing, then **Does the contaminant plume meet <u>all of the additional characteristics</u> of one of the five (5) LTCP classes listed below?**	☐ **Yes**	☐ **No**	☐ **NE**
Class 1	☐ **Yes**	☐ **No**	☐ **NE**
Is < 100 feet in length	☐ Yes	☐ No	☐ NE
There is no free product	☐ Yes	☐ No	☐ NE
The nearest existing water supply well is > 250 feet from the defined plume boundary	☐ Yes	☐ No	☐ NE
The nearest existing surface water body is > 250 feet from the defined plume boundary	☐ Yes	☐ No	☐ NE
Class 2	☐ **Yes**	☐ **No**	☐ **NE**
Is < 250 feet in length	☐ Yes	☐ No	☐ NE
There is no free product	☐ Yes	☐ No	☐ NE
The nearest existing water supply well is > 1,000 feet from the defined plume boundary	☐ Yes	☐ No	☐ NE
The nearest existing surface water body is > 1,000 feet from the defined plume boundary	☐ Yes	☐ No	☐ NE
The dissolved concentration of benzene is <3,000 µg/L	☐ Yes	☐ No	☐ NE
The dissolved concentration of MTBE is <1,000 µg/L	☐ Yes	☐ No	☐ NE
Class 3	☐ **Yes**	☐ **No**	☐ **NE**
Is < 250 feet in length	☐ Yes	☐ No	☐ NE
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	☐ NE
The plume has been stable or decreasing for a minimum of 5 years	☐ Yes	☐ No	☐ NE
The nearest existing water supply well is > 1,000 feet from the defined plume boundary	☐ Yes	☐ No	☐ NE
The nearest existing surface water body is > 1,000 feet from the defined plume boundary	☐ Yes	☐ No	☐ NE
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	☐ NE
Class 4	☐ **Yes**	☐ **No**	☐ **NE**
Is < 1,000 feet in length	☐ Yes	☐ No	☐ NE
There is no free product	☐ Yes	☐ No	☐ NE
The nearest existing water supply well or surface water body is > 1,000 feet from the defined plume boundary	☐ Yes	☐ No	☐ NE
The nearest existing surface water body is > 1,000 feet from the defined plume boundary	☐ Yes	☐ No	☐ NE
The dissolved concentration of benzene is <1,000 µg/L	☐ Yes	☐ No	☐ NE
The dissolved concentration of MTBE is <1,000 µg/L	☐ Yes	☐ No	☐ NE
Class 5	☐ **Yes**	☐ **No**	☐ **NE**
Based on an analysis of site specific conditions at 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	☐ NE

(Media Specific Criteria for Groundwater Evaluation Continued on Next Page)

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

Sites Not Meeting the Characteristics of the Five Groundwater Plume Classes

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

Plume Length (That Exceeds Water Quality Objectives)			
≥ 100 feet and < 250 feet	☐ Yes		
≥ 250 feet and < 1,000 feet	☐ Yes		
≥ 1,000 feet	☐ Yes		
Unknown	☐ Yes		
For Sites with Free Product			
Free product in groundwater	☐ Yes	☐ No	☐ UNK
Free product has been removed to the maximum extent practicable	☐	☐ No	☐ UNK
The plume has been stable or decreasing for 5-Years	☐	☐ No	☐ UNK
The owner is willing to accept a Land Use Restriction (if required)	☐	☐ No	☐ UNK
Free product extends offsite	☐ Yes	☐	☐ UNK
Benzene Concentration			
≥ 1,000 µg/L and < 3,000 µg/L	☐ Yes		
≥ 3,000 µg/L	☐ Yes		
Unknown	☐ Yes		
MTBE Concentration			
≥ 1,000 µg/L	☐ Yes		
Unknown	☐ Yes		
Nearest Supply Well (From Plume Boundary)			
≤ 250 Feet	☐ Yes		
> 250 Feet and ≤ 1,000 Feet	☐ Yes		
Unknown	☐ Yes		
Nearest Surface Water Body (From Plume Boundary)			
≤ 250 Feet	☐ Yes		
> 250 Feet and ≤ 1,000 Feet	☐ Yes		
Unknown	☐ Yes		

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

CSM Minimum Required Information

Has the minimum required information listed below been provided in the CSM for evaluation of case compliance with Media Specific Criteria for Groundwater?	☒ **Yes**	☐ **No**	
Sufficient data been presented to demonstrate that site characterization activities have defined the horizontal and vertical extent of the plume?	☒ Yes	☐ No	☐ NA
Demonstration of plume stability using a valid technical analysis that considers the accuracy of data from the wells, well placement within the plum, and changes in horizontal and vertical extent of the plume?	☒ Yes	☐ No	☐ NA
Evaluation of factors such as seasonal variability, water level changes, sampling methods, well construction, and other factors that can affect data quality?	☒ Yes	☐ No	☐ NA
A recent well survey that uses all available well information from both the Department of Water Resources and local agencies (Zone 7 Water Agency of Alameda County Public Works as appropriate)?	☒ Yes	☐ No	☐ NA
The location of surface water bodies and water supply wells located within 2,000 feet of the site presented on a site figure with benzene and MTBE isoconcentration contours?	☒ Yes	☐ No	☐ NA
A table identifying each water supply well along with the well construction details?	☒ Yes	☐ No	☐ NA
A discussion of surface water bodies within 2,000 feet of the site and details on hydraulic connection with the groundwater plume?	☒ Yes	☐ No	☐ NA
A discussion of current and reasonable anticipated near-term future scenarios at the site and in the vicinity of the site and possible Land Use Restrictions?	☒ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA

(Refer to Att. 1 - CSM Detailed Evaluation Checklist for Identification of Data Gaps)

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

Case Notes

End of Groundwater Criteria Evaluation

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

Does the site meet one of the three petroleum vapor intrusion to indoor air specific criteria (a, b, or c), <u>or</u> qualify for the active commercial fueling facility exemption?	☒ **YES**	☐ **NO**

LTCP 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, <u>or</u>

(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; <u>or</u>

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; <u>or</u>

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.

Exception: Exposures to petroleum vapors associated with historical fuel system releases are comparatively insignificant relative to exposures from small surface spills and fugitive vapor releases that typically occur at active fueling facilities. 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."

Does the site qualify for an EXEMPTION from the Petroleum Vapor Intrusion to Indoor Air criteria (i.e., the site is an active commercial petroleum fueling facility? Are release characteristics reasonably believed to pose an unacceptable health risk to facility users or nearby facilities? ☐ Yes ☐ No ☐ NE	☐ **Yes**	☒ **No**
a. Do site-specific conditions at the release site satisfy all of the characteristics and criteria of scenarios 1 through 3 as applicable, <u>or</u> all of the characteristics and criteria of scenario 4? Scenario 1: Unweathered LNAPL in groundwater ☐ Yes ☒ No Scenario 2: Unweathered LNAPL in soil ☐ Yes ☒ No Scenario 3: Dissolved benzene concentrations in groundwater (oxygen ≥ 4%) ☐ Yes ☒ No Scenario 4: Dissolved phase benzene concentrations in groundwater (oxygen < 4%) ☒ Yes ☐ No **(Refer to Next Page for Scenario 1 through 4 Characteristics)**	☒ **Yes**	☐ **No**
b. Has a site-specific risk assessment for the vapor intrusion pathway been conducted and demonstrates that human health is protected to the satisfaction of the regulatory agency?	☐ **Yes**	☒ **No**
c. As a result of controlling exposure through the use of mitigation measures or through the use of institutional or engineering controls, has the regulatory agency determined that petroleum vapors migrating from soil or groundwater will have no significant risk of adversely affecting human health?	☐ **Yes**	☒ **No**

(Media Specific Criteria for Vapor Intrusion to Indoor Air Evaluation Continued on Next Page)

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

Scenarios 1 through 3: Bioattenuation Zone Characteristics

Scenario 1: Unweathered LNAPL in Groundwater				
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	☐ 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	☐ NE	☐ NA

Scenario 2: Unweathered LNAPL in Soil				
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	☐ 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	☐ NE	☐ NA

Scenario 3: Dissolved Phase Benzene Concentrations in Groundwater				
Sites without oxygen data or where oxygen is <4% and benzene concentrations < 100 µg/l (Figure A)	☐ **Yes**	☒ **No**	☐ **NE**	☐ **NA**
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	☐ NE	☐ NA
Contains total TPH (TPH-g and TPH-d combined) < 100 mg/kg throughout the entire depth of the bioattenuation zone	☐ Yes	☒ No	☐ NE	☐ NA
Sites without oxygen data or where oxygen is <4% and benzene concentrations ≥ 100 µg/L but < 1,000 µg/L (Figure B)	☐ **Yes**	☐ **No**	☐ **NE**	☐ **NA**
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	☐ NE	☐ NA
Sites with oxygen ≥ 4% and benzene concentrations < 1,000 µg/L (Figure C)	☐ **Yes**	☒ **No**	☐ **NE**	☐ **NA**
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	☐ NE	☐ NA
Contains total TPH (TPH-g and TPH-d combined) < 100 mg/kg throughout the entire depth of the bioattenuation zone	☐ Yes	☒ No	☐ NE	☐ NA

(LTCP Media Specific Criteria for Vapor Intrusion to Indoor Air Evaluation Continued on Next Page)

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

Scenario 4 Characteristics: Direct Measurement of Soil Gas Concentrations (No Bioattenuation Zone)

Were soil gas samples obtained from the required locations?	☒ **Yes**	☐ **No**	☐ **NE**	☐ **NA**
Beneath or adjacent to an existing building: Soil gas samples collected at least 5 feet below the bottom of the building foundation	☐ Yes	☐ No	☐ NE	☒ NA
Future construction: Soil gas samples from at least five feet below ground surface	☒ Yes	☐ No	☐ NE	☐ NA
Were soil gas samples collected in accordance with DTSC Advisory with DTSC Advisory – Active Soil Gas Investigations (April 2012)?	☒ **Yes**	☐ **No**	☐ **NE**	☐ **NA**

Are <u>all of the following criteria</u> for a bioattenuation zone satisfied?	☒ **Yes**	☐ **No**	☐ **NE**	☐ **NA**
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; <u>and</u>	☒ Yes	☐ No	☐ NE	☐ NA
TPH (TPHg + TPHd) is less than 100 mg/kg (measured in at least two depths within the five-foot zone; <u>and</u>	☒ Yes	☐ No	☐ NE	☐ NA
Oxygen is ≥ 4% measured at the bottom of the five-foot zone	☒ Yes	☐ No	☐ NE	☐ NA

If the bioattenuation zone criteria <u>are all satisfied</u>, then do soil gas concentrations meet the following criteria?	☒ **Yes**	☐ **No**	☐ **NE**	☐ **NA**
Residential	☒ **Yes**	☐ **No**	☐ **NE**	☐ **NA**
Benzene <85,000 µg/m^3	☒ Yes	☐ No	☐ NE	☐ NA
Ethylbenzene <1,100,000 µg/m^3	☒ Yes	☐ No	☐ NE	☐ NA
Napthalene <93,000 µg/m^3	☒ Yes	☐ No	☐ NE	☐ NA
Commercial	☐ **Yes**	☐ **No**	☐ **NE**	☐ **NA**
Benzene <280,000 µg/m^3	☐ Yes	☐ No	☐ NE	☐ NA
Ethylbenzene <3,600,000 µg/m^3	☐ Yes	☐ No	☐ NE	☐ NA
Napthalene <310,000 µg/m^3	☐ Yes	☐ No	☐ NE	☐ NA

If the bioattenuation zone criteria <u>are not satisfied</u>, then do soil gas concentrations meet the following criteria?	☐ **Yes**	☐ **No**	☐ **NE**	☒ **NA**
Residential	☐ **Yes**	☐ **No**	☐ **NE**	☒ **NA**
Benzene <85 µg/m^3	☐ Yes	☐ No	☐ NE	☒ NA
Ethylbenzene <1,100 µg/m^3	☐ Yes	☐ No	☐ NE	☒ NA
Napthalene <93 µg/m^3	☐ Yes	☐ No	☐ NE	☒ NA
Commercial	☐ **Yes**	☐ **No**	☐ **NE**	☐ **NA**
Benzene <280 µg/m^3	☐ Yes	☐ No	☐ NE	☐ NA
Ethylbenzene <3,600 µg/m^3	☐ Yes	☐ No	☐ NE	☐ NA
Napthalene <310 µg/m^3	☐ Yes	☐ No	☐ NE	☐ NA

(LTCP Media Specific Criteria for Vapor Intrusion to Indoor Air Evaluation Continued on Next Page)

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

Additional questions for sites that do not meet the LTCP Criteria (a, b, or c):

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

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

CSM Minimum Required Information

Has the minimum required information listed below been provided in the CSM for evaluation of case compliance with the Media Specific Criteria for Vapor Intrusion to Indoor Air?	☒ **Yes**	☐ **No**	
Sufficient data to demonstrate that site characterization is complete and that the data demonstrate that the site-specific conditions satisfy all the assumptions, characteristics, and screening criteria of scenarios 1 through 3, or all the assumptions, characteristics, and screening criteria of scenario 4?	☒ Yes	☐ No	☐ NA
Evidence of unweathered LNAPL in soil or groundwater?	☒ Yes	☐ No	☐ NA
Soil data to demonstrate that total TPH concentrations (TPH-g and TPH-d combined) in soil are < 100 mg/kg throughout the specified bioattenuation zone depth?	☒ Yes	☐ No	☐ NA
Depth of foundation of existing or potential buildings?	☐ Yes	☒ No	☐ NA
Soil gas data to demonstrate that a continuous bioattenuation zone is or is not present?	☒ Yes	☐ No	☐ NA
Concentrations of benzene in groundwater?	☒ Yes	☐ No	☐ NA
Oxygen data in the bioattenuation zone?	☒ Yes	☐ No	☐ NA
Results and evaluation of preferential pathway and utility conduit surveys to determine whether a continuous bioattenuation zone is present?	☒ Yes	☐ No	☐ NA
Evaluation of data representativeness, quality, spatial distribution, and temporal variability relative to current or potential receptors and sources?	☒ Yes	☐ No	☐ NA
Evaluation to assess whether nearby facilities potentially may be impacted by petroleum vapor intrusion?	☒ Yes	☐ No	☐ NA
Sufficient data to demonstrate that through the use of mitigation measures or institutional controls, exposure to petroleum vapors migrating from soil or groundwater will have no significant risk of adversely affecting human health?	☒ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA

(Refer to Att. 1 - CSM Checklist for Identification of Data Gaps)

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

Case Notes

Insufficient data is present to allow an evaluation of the use of mitigation measures and institutional controls to mitigate exposure to petroleum vapors migrating from soil or groundwater due to site disturbances at redevelopment (utility trenches, utility penetrations through a concrete slab, reduced soil moisture and oxygen percentages beneath a slab, increased soil moisture in landscaping, etc.), the unknown land use, or the unknown (unproposed) construction type.

*****End of Vapor Intrusion to Indoor Air Evaluation*****

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

Does the site satisfy the Media-Specific Criteria for Direct Contact and Outdoor Air Exposure, or does the site qualify for the exemption?	☐ **YES**	☒ **NO**

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. 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; or

b. Maximum concentration 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."

Does the site qualify for an EXEMPTION from Direct Contact and Outdoor Air Exposure Criteria (i.e., is the upper 10 feet of soil free of petroleum contamination)?	☐ **Yes**	☒ **No**
If the site does not qualify for the exemption, then does the site satisfy the media-specific criteria (a, b, or c) for direct contact and outdoor air exposure?	☐ **Yes**	☒ **No**

a. Are maximum concentrations of petroleum constituents in soil less than or equal to those listed in Table 1 for the specified depth bgs? **(Refer to Next Page for Concentrations Limits Evaluation)**	☐ Yes	☒ No
b. Are the maximum concentrations of petroleum constituents in soil less than levels that a site specific risk assessment demonstrates will have no significant risk of adversely affecting human health?	☐ Yes	☒ No
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

(Media Specific Criteria for Direct Contact and Outdoor Air Exposure Evaluation Continued on Next Page)

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

Maximum Concentrations of Petroleum Constituents in Soil (Scenario a)

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

Chemical	Residential		Commercial/Industrial		Utility Worker
	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	☐ NE
Residential: 0 to 5 feet bgs	☒ Yes	☐ No	☐ NE
Residential: 5 to 10 feet bgs	☐ Yes	☒ No	☐ NE
Commercial/Industrial: 0 to 5 feet bgs	☒ Yes	☐ No	☐ NE
Commercial/Industrial: 5 to 10 feet bgs	☐ Yes	☒ No	☐ NE
If exposure to construction or utility trench workers is reasonably anticipated, are the concentration limits for the Utility Worker satisfied?	☐ Yes	☒ No	☐ NE
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	☐ NE
Is the area of impacted soil where a particular exposure occurs ≤ 82 feet by 82 feet?	☐ Yes	☒ No	☐ NE
Is the receptor located at the downgradient edge for inhalation exposure?	☐ Yes	☐ No	☐ NE
Is the wind speed < 2.25 meters per second (7.38 feet per second) on average?	☐ Yes	☐ No	☐ NE
Are there different exposure scenarios than residential, commercial/industrial, utility worker) at the site?	☐ Yes	☐ No	☐ NE

(LTCP Media Specific Criteria for Direct Contact and Outdoor Air Exposure Evaluation Continued on Next Page)

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

Additional Questions FOR Sites That Do Not Meet the LTCP Criteria

Indicate only those conditions that do not meet the Direct Contact and Outdoor Air Exposure scenarios:

Exposure Type:	
Residential	☒ Yes
Commercial	☒ Yes
Utility Worker	☐ Yes
Petroleum Constituents in Soil:	
≤ 5 feet bgs	☒ Yes
> 5 feet bgs and ≤ 10 feet bgs	☒ Yes
Unknown	☐ Yes
Soil Concentrations of Benzene:	
> 1.9 mg/kg and ≤ 2.8 mg/kg	☐ Yes
> 2.8 mg/kg and ≤ 8.2 mg/kg	☐ Yes
> 8.2 mg/kg and ≤ 12 mg/kg	☐ Yes
> 12 mg/kg and ≤ 14 mg/kg	☐
> 14 mg/kg	☒ Yes
Unknown	☐ Yes
Soil Concentrations of Ethylbenzene:	
> 21 mg/kg and ≤ 32 mg/kg	☐ Yes
> 32 mg/kg and ≤ 89 mg/kg	☐ Yes
> 89 mg/kg and ≤ 134 mg/kg	☐ Yes
> 134 mg/kg and ≤ 314 mg/kg	☐ Yes
> 314 mg/kg	☒ Yes
Unknown	☐ Yes
Soil Concentrations of Naphthalene:	
> 9.7 mg/kg and ≤ 45 mg/kg	☐ Yes
> 45 mg/kg and ≤ 219 mg/kg	☐ Yes
> 219 mg/kg	☐ Yes
Unknown	☒ Yes
Soil Concentrations of PAH:	
> 0.063 mg/kg and ≤ 0,68 mg/kg	☐ Yes
> 0.68 mg/kg and ≤ 4.5 mg/kg	☐ Yes
> 4.5 mg/kg	☐ Yes
Unknown	☒
Area of Impacted Soil:	
Area of Impacted Soil > 82 by 82 Feet	☒ Yes
Unknown	☐ Yes

This case should be closed in spite of <u>not</u> meeting policy criteria: List Reasons:	☐ Yes

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

CSM Minimum Required Information

Has the minimum required information listed below been provided in the CSM for evaluation of case compliance with following Media Specific Criteria for Direct Contact and Outdoor Air Exposure?	☒ **Yes**	☐ **No**	
Sufficient data to demonstrate that site characterization is complete for the prescribed depth ranges of 0 to 5 feet and 5 to 10 feet bgs in order to assess potential direct contact and outdoor air exposure?	☒ Yes	☐ No	☐ NA
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?	☒ Yes	☐ No	☐ NA
Analytical data for all chemicals of concern including total petroleum hydrocarbons in order and an assessment of whether unique conditions not considered in the Policy may exist at the site?	☒ Yes	☐ No	☐ NA
Evaluation of data for data representativeness, quality, spatial distribution relative to current or potential receptors and sources, and temporal variability?	☒ Yes	☐ No	☐ NA
Description of the current and expected future land use, redevelopment, or construction for the site?	☒ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA
	☐ Yes	☐ No	☐ NA

(Refer to Att. 1 - CSM Detailed Evaluation Checklist for Identification of Data Gaps)

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable

Direct Contact and Outdoor Air Exposure: Case Notes

Significant residual petroleum hydrocarbons remain in soil at the site (up to 3,400 mg/kg TPHd, 18,000 mg/kg TPHg, 92 mg/kg benzene, 440 mg/kg ethylbenzene, and uncharacterized naphthalene and PAHs). Residual contamination is predominately located between 5 and 10 feet below grade surface, extends to at least 16 feet bgs, but is undefined vertically in a central residual soil contamination core zone (but appears defined vertically outside the core zone). These concentrations fail the residential, commercial, and utility worker direct contact values of Table 1 of the LTCP, and indicate that the secondary mass has not been removed to the maximum extent practicable. An approved Low-Flow Air Sparge pilot test has successfully mobilized residual contamination at the site and introduced an order of magnitude increase to groundwater; however, a collection device (such as vapor extraction) has not been implemented.

Existing near surface analytical sampling indicates that concentrations of lead, PCBs, and organochlorine pesticides are present in near surface soil across the three parcel formerly residential redevelopment site.

A site specific risk assessment has not used all chemicals of concern at the site in the Risk Assessment.

Insufficient data is present to allow an evaluation of the use of mitigation measures and institutional controls to mitigate exposure to petroleum vapors migrating from soil or groundwater due to site disturbances at redevelopment (utility trenches, utility penetrations through a concrete slab, reduced soil moisture and oxygen percentages beneath a slab, increased soil moisture in landscaping, etc.), the unknown future land use, or the unknown (unproposed) construction type.

*****End of Direct Contact and Outdoor Air Exposure Criteria Evaluation*****

KEY: NE = Identified Data Gap - Needs Further Evaluation NA = Not Applicable