

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION**

TENTATIVE ORDER 2023-XXXX

AMENDMENT OF SITE CLEANUP REQUIREMENTS ORDER R2-2007-0009 for:

***UNION PACIFIC RAILROAD COMPANY,
MARY LOU HELIX, KAREN HOOK, DEBBIE HOOK, AND BLAKE PUCCELL,
AND CONTRA COSTA COUNTY***

For the property referred to as:

HOOKSTON STATION

and located at:

228 HOOKSTON ROAD
PLEASANT HILL, CONTRA COSTA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter Regional Water Board), finds that:

1. **Site Location:** The Hookston Station property is located at 228 Hookston Road in Pleasant Hill, Contra Costa County (referred to Source Property in this amendment). The regulated site consists of the Source Property and downgradient areas impacted with pollution, including, but not limited to, the Colony Park neighborhood in Walnut Creek (hereafter collectively referred to as the Site in this amendment; Figure 1). The Source Property is approximately 8 acres with commercial and light-industrial businesses operating on it. Properties surrounding the Source Property are also used for commercial and light-industrial purposes or for residential housing.
2. **Regulatory Status:** The Regional Water Board adopted Site Cleanup Requirements Order R2-2003-0035 for the Site on April 16, 2003, and amended it on September 15, 2004, by adopting Order R2-2004-0081 (jointly, the 2003/2004 Orders). On January 23, 2007, the Regional Water Board rescinded the 2003/2004 Orders and adopted Site Cleanup Requirements Order R2-2007-0009 (2007 Order).

The Site is subject to the Self-Monitoring Program attached. The Executive Officer approved revisions to the Self-Monitoring Program of the 2007 Order on August 19, 2019, in response to requests from the named Responsible Parties (defined in the 2007 Order) on February 25 and July 30, 2019.

3. **Site History:** The Source Property was owned and operated by Southern Pacific Transportation Company (Southern Pacific) from June 1891 until September 1983 as a portion of the San Ramon Branch line. The Source Property was developed by Southern Pacific into a light industrial business complex between approximately

1965 and 1983. A former tenant at the Site, E-T Industries, Inc. (formerly known as Wheel Centre, Inc., and/or "ET Mags") and Cal-Motive Industries, Inc. (also once known as "ET Mags"), manufactured chrome and alloy wheels and used trichloroethene (TCE), a chlorinated solvent. ET Mags went into bankruptcy and is no longer in existence. Southern Pacific transferred the Source Property to Mr. and Mrs. Dan Helix in 1983, and the Contra Costa County Redevelopment Agency (CCCRA) subsequently purchased the eastern portion of the Site in 1989. At the time the 2007 Order was issued, the western portion of the Source Property was owned by Mr. and Mrs. Dan Helix, Ms. Elizabeth Young, Mr. John Hook, Ms. Nancy Ellicock, and Mr. Steven Pucell (sometimes known collectively as the Hookston Group or Hookston Plaza owners). Daniel C. Helix, John V. Hook, Nancy Ellicock, and Steven Pucell are now deceased and their successors in interest are described in Finding 11 below. Contra Costa County (County) succeeded to CCCRA's ownership of the eastern portion of the Site.

Environmental investigations conducted at the Source Property between 1989 and 1996 discovered the presence of both petroleum-based products and chlorinated solvents in soil and groundwater. These investigations included work by Harding Lawson Associates (January 1990 and June 1990) on behalf of Contra Costa County, and Engeo, Inc. (1991 to 1992) and Treadwell & Rollo, Inc. (1993 to 1996) on behalf of the Hookston Group. Investigations were performed as part of property transfers and to support pending litigation between Union Pacific Railroad (with which Southern Pacific merged), the Hookston Group, and the County. More recent studies further evaluated the nature and extent of pollutants in soil and groundwater and evaluated soil vapor and indoor air to assess human health risk.

Since the 2007 Order, the Responsible Parties have performed additional remedial actions to reduce concentrations of VOCs. To treat A-Zone groundwater, a permeable reactive barrier (PRB) was installed downgradient of the source area between March and June 2009 located in Len Hester Park and along Hookston Road (ERM; October 2009). To treat B-Zone groundwater, potassium permanganate (KMnO₄) was injected between February 2008 and May 2010 for chemical oxidation of the source area (ERM; December 2012).

Contra Costa County (acting independently of the Responsible Parties) also removed arsenic- and petroleum-impacted soil as part of a landscaping project in the Iron Horse Trail area. Soil was excavated in seven areas between Hookston Road and Mayhew Way (ENGE0, October 3, 2017).

- 4. Purpose of Amendment:** This amendment updates the 2007 Order to require additional cleanup based on the past 15 years of data and analyses from investigations and monitoring activities, as discussed in more detail in Finding 6. In 2018, under Task 10 of the 2007 Order, the Regional Water Board concluded that the remedy implemented will not be effective to attain cleanup levels in a reasonable timeframe and required an alternative cleanup plan.

The Responsible Parties submitted an Alternative Cleanup Plan (ACP) on September 1, 2020, however, it needs to be revised to attain cleanup levels in a reasonable timeframe, among other revisions. The 2007 Order does not include requirements related to implementing an alternative compliance plan, necessitating this amendment. This amendment, therefore, requires the submission and implementation of a revised alternative cleanup plan, or more specifically, an alternative remedial design and implementation plan. It includes associated requirements such as indoor air monitoring and a remedial effectiveness evaluation. This amendment updates the cleanup levels for soil, groundwater, soil vapor, and indoor air because technical developments in risk assessment have occurred since the 2007 Order. This amendment also updates the named Responsible Parties because several of the individuals named in the 2007 Order are deceased and other individuals have succeeded to their ownership interest in the Source Property. Finally, this amendment revises the Self-Monitoring Program attached to the 2007 Order.

- 5. Need for Additional Cleanup:** The Regional Water Board evaluated the remedial treatment effectiveness in 2018 and concluded that the selected remedy would not achieve cleanup levels within a reasonable timeframe. In the A-Zone aquifer, volatile organic compounds (VOC) concentrations remain above cleanup levels within an approximately 150-foot-wide zone located immediately downgradient of where a permeable reactive barrier was installed to cleanup A-Zone groundwater.” In the B-Zone aquifer, while trichlorethylene (TCE) concentrations generally declined in response to potassium permanganate injections, some wells had TCE concentrations that were stable to increasing. Thus, the Regional Water Board concluded that an alternative cleanup plan is required to achieve cleanup objectives. To develop the plan, the Responsible Parties obtained additional soil and groundwater data at the Site, which identified TCE in soil and soil vapor in the source area above cleanup levels and further defined the width of a target treatment zone in the mid-plume area (ERM, October 2019 and April 2022).

The Responsible Parties submitted an *Alternative Cleanup Plan* that included evaluations of an in-situ bioremediation pilot test and a soil vapor extraction pilot test (ERM; September 2020). In-situ bioremediation was considered feasible for treating A-Zone groundwater and soil vapor extraction was not feasible for implementation in onsite soils. Cleanup alternatives were further evaluated in a *Revised Feasibility Study Addendum/Remedial Design and Implementation Plan* (ERM, October 2022; *October 2022 Revised Plan*) and the action recommended was in-situ bioremediation (carbon substrate and bacterial culture inoculations) in the A- and B-Zones with targeted shallow soil excavation in the source area and the construction of a horizontal well gallery in the excavation area for potential use as a future vapor intrusion prevention system.

The *October 2022 Revised Plan* has not yet been approved. Attainment of cleanup levels by the methods evaluated in the *October 2022 Revised Plan* may take up to

62 years, which is not a reasonable timeframe to reach water quality objectives at the Site. A reasonable cleanup timeframe is site specific and is based on various factors including hydrogeologic conditions, conceptual site model, feasibility of cleanup, impacts to beneficial uses, and the timeframe for anticipated beneficial use of impacted groundwater. Eight private wells have already been impacted and decommissioned due to pollution associated with the Site. Existing beneficial uses of groundwater at the Site are currently impaired and a shorter cleanup timeframe is needed to restore beneficial uses as soon as possible. Future beneficial uses include an increased reliance on groundwater as a source of drinking water. There is also concern that in the absence of a more aggressive cleanup plan, water quality may further degrade to where the beneficial use of groundwater as a municipal water source may be lost. Furthermore, VOCs in soil vapor exceed values for protecting human health from indoor air at residential properties that are currently occupied. Indoor air monitoring and vapor intrusion mitigation systems (VIMS) are not acceptable long-term safety measures, and additional cleanup and air monitoring is required to protect the health of residential and commercial building occupants in the vicinity of the plume. An alternative remedial design and implementation plan should propose a revised cleanup plan that meets cleanup levels within a reasonable timeframe. A reasonable timeframe shall be a period that considers the impact to existing and anticipated beneficial uses to groundwater and risk to receptors. A request for an Alternative Remedial Design and Implementation Plan is described in Task 1.

6. **Additional Site Information:** The Responsible Parties have performed investigation work to characterize contaminants in soil, groundwater, surface water, soil vapor, and indoor air.
 - a. **TCE in Soil and Groundwater:** TCE analyzed in 302 soil samples collected at 90 locations across the Site was typically in the range of 100 to 200 micrograms per kilogram ($\mu\text{g}/\text{kg}$) and was most elevated, at a concentration of 2,580 $\mu\text{g}/\text{kg}$, in soil collected from the southwest portion of the Source Property where businesses that used TCE formerly operated. TCE in groundwater was primarily within coarse-grained deposits of the A- and B-Zones (at depths above 70 feet) and was most elevated in the mid-section of the plume, near Hookston Road and Hampton Drive, based on regular monitoring of a network of 39 monitoring wells. The TCE plume extended about 2,000 feet northeast of the Source Property beneath the Colony Park residential neighborhood, to the Walnut Creek channel.
 - b. **Surface Water in Walnut Creek:** Water quality and sediment samples collected from Walnut Creek indicated that VOCs were below applicable screening levels or not detected (ERM, 2004).

- c. **Characterization of Soil Vapor and Indoor Air:** Investigations of soil vapor and indoor air to delineate the soil vapor plume and evaluate risk of vapor intrusion started after 2004, when the 2003 Order was amended. Monitoring of 32 permanent soil vapor monitoring probes at 23 locations (19 in the Colony Park neighborhood and 4 onsite in the source area) detected TCE most frequently in soil vapor from probes above the core of the A-Zone groundwater plume. Monitoring of indoor air and ambient (outside) air included an indoor air study for the Colony Park neighborhood, located directly downgradient of Len Hester Park (Figure 1 in the attached Self-Monitoring Program). TCE was the most frequently detected VOC in indoor and outdoor air.

A Requirement for Soil Vapor and Indoor Air Sampling Workplan was issued on October 6, 2016, to conduct additional vapor monitoring to investigate vapor intrusion to selected residential units at the Colony Park townhomes/apartments located on the southeast corner of Bancroft and Hookston Roads. The requirement was prompted by new information about TCE toxicity. Previous soil vapor survey data collected in 2003 in the vicinity of Bancroft Road indicated that TCE exceeded newly-updated residential land use trigger levels to sample indoor air. Property access discussions with the Colony Park Townhouse Association delayed the execution of the work proposed to February 2021. As of the most recent update in the April 1, 2022, Colony Park Town Houses Vapor Intrusion Investigation Progress Reports No. 2, property access has been granted at one out of three residences for monitoring soil vapor and indoor air. TCE was not detected in the indoor air samples that were collected, but without access to the other residences the possibility of vapor intrusion cannot be determined. A request for continued monitoring at these residences is described in Task 2.

An Evaluation of Hookston Station Indoor Air TCE Sampling Results Based on Revised Human Health Toxicity Criteria (ERM, January 24, 2017) evaluated residences in the Colony Park neighborhood relative to a new residential ESL for TCE of 0.48 µg/m³, presented by the U.S. Environmental Protection Agency (USEPA), the California Environmental Protection Agency (Cal/EPA) Department of Toxic Substances Control (DTSC), and the Regional Water Board. TCE was below the new residential ESL of 0.48 µg/m³.

According to the most recent Annual Indoor Air Monitoring Report, dated May 2022, the offsite soil vapor plume is delineated in the Colony Park neighborhood.

7. **Site Monitoring Information:** Groundwater is sampled biennially, and soil vapor and indoor air are sampled annually at the Site for VOCs, as summarized in self-

monitoring reports that include the 2021 and 2022 Annual Monitoring Reports, dated May 18, 2022, and January 30, 2023, and the 2022 Annual Indoor Air Monitoring Report, dated January 30, 2023. The maximum concentrations of VOCs detected in groundwater, soil vapor, and indoor air during the 2022 or 2021 calendar years are discussed below.

- **Groundwater:** VOCs in groundwater, either on or downgradient of the Source Property, exceeded a drinking water standard.

Analyte	Maximum A-Zone concentration in 2021 (µg/L)	Maximum B-Zone concentration in 2021 (µg/L)	MCL (µg/L)
TCE	1,430	648	5
cis-1,2-DCE	2,160	389	6
trans-1,2-DCE	50.3	6.03	10
1,1-DCA	16.1	2.6	5
1,2-DCA	1.71	0.81	0.5
1,1-DCE	139	60.8	6
Vinyl chloride	40.9	134	0.5
PCE*	1.9	2.23	5
Benzene*	2.69	0.811	1

TCE = trichloroethylene
 Cis-1,2-DCE = cis-1,2-dichloroethene
 Trans-1,2-DCE = trans-1,2-dichloroethene
 1,1-DCA = 1,1-dichloroethane
 1,2-DCA = 1,2-dichloroethane
 1,1-DCE = 1,1-dichloroethene
 PCE = Tetrachloroethene

*Site history information and data suggest that PCE and benzene do not originate from the Source Property

- **Soil Vapor:** VOCs in soil vapor, either on or downgradient of the Source Property, exceeded values for human health protection for residential land use in the ESLs.

Analyte	Maximum concentration in 2022 (µg/m3)	Soil Vapor ESL for Residential Land Use (µg/m3)
TCE	4,650	16
cis-1,2-DCE	150	280
trans-1,2-DCE	30	2,800
1,1-DCE	12.5	2,400
Vinyl chloride	1,700	0.32
*PCE	9,370	15
*Benzene	712	14

* Site history information and data suggest that PCE and benzene do not originate from the Source Property

- **Indoor and Ambient (Outdoor) Air:** VOCs in indoor and ambient air exceeded values for human health protection for residential land use in the ESLs.

Analyte	Maximum Indoor Air Concentration in 2022 (µg/m3)	Maximum Crawl Space Concentration in 2022 (µg/m3)	Maximum Ambient Air Concentration in 2022 (µg/m3)	Residential Indoor Air ESL (µg/m3)
TCE	1.38**	0.187	<1.07	0.48

cis-1,2-DCE	<0.0793	<0.0793	<0.0793	8.3
trans-1,2-DCE	<0.0793	<0.0793	<0.0793	83
1,1-DCE	<0.0793	<0.0793	<0.0793	73
Vinyl chloride	0.0514	<0.0511	<0.0511	0.0095
PCE*	3.42	0.706	<0.136	0.46
Benzene*	1.72	0.866	0.645	0.097

* Site history information and data suggest that PCE and benzene do not originate from the Source Property

**Maximum concentrations in indoor air are suspected to be from household products containing TCE as the second floor and crawl space TCE samples collected from the home during this monitoring event were 0.185 µg/l and non-detect, respectively. Future indoor air sampling will assess potential vapor intrusion.

8. **Commingled Pollution:** PCE and benzene detected in monitoring data from the Site are associated with two adjacent properties, located upgradient, to the west of the Source Property. Investigations at [Mayhew Center](#) detected VOCs and investigations at [Pitcock Petroleum](#) detected VOCs and petroleum hydrocarbons. Both of those sites have taken remedial actions to address these contaminants.

- a. Former operations at Mayhew Center, which included manufacturing printed wire boards, were responsible for discharging PCE and its associated degradation products, including TCE, to groundwater at the Mayhew site. The PCE plume migrated downgradient toward the Hookston Station and Pitcock Petroleum sites. Mayhew Center has treated its source area through soil vapor extraction from 2018 to 2021, which targeted PCE in soil and groundwater. Groundwater injections in January 2022 targeted the remaining PCE groundwater plume (located between Mayhew Center and Hookston Station). These remedial actions reduced PCE in soil gas and groundwater, and groundwater monitoring will evaluate whether PCE concentrations rebound in the injection area.
- b. Pitcock Petroleum, a petroleum product distribution facility, was investigated for petroleum hydrocarbons and chlorinated solvents, which were detected in soil, soil vapor, and groundwater. A dual-phase extraction system was started to remediate the Pitcock Petroleum site

in 2020, and remediation concluded in 2022. Pitcock Petroleum requested site closure, and the closure request is under evaluation.

9. **Evaluation of Risks:** VOCs at the Site exceed environmental screening levels (a tool to screen or evaluate chemical threats posed by contamination at a site; ESLs), indicating potential threats to human health and the environment. Monitoring data for TCE, PCE, vinyl chloride, cis-DCE, trans-DCE, 1,1-DCA, 1,2-DCA and 1,1-DCE, which are the primary chemicals of concern identified at the Site, exceeded ESLs for soil (direct exposure, leaching to groundwater, and nuisance), for groundwater (nuisance, indoor air, aquatic life, and drinking water), and for soil gas (indoor air), as shown by an “X” in the following table.

	Human health – direct	Leaching to ground water	Nuisance	Indoor air	Aquatic life	Drinking water
Soil:						
TCE	X	X				
Groundwater:						
TCE			X	X	X	X
PCE*				X		X
Cis-DCE						X
Trans-DCE						X
Vinyl Chloride				X		X
1,1-DCA						X
1,2-DCA						X
1,1-DCE						X
Soil Gas:						
TCE				X		
PCE*				X		
Vinyl Chloride				X		

* Site history information and data suggest that PCE does not originate from the Source Property

Screening levels for human health concerns (e.g., indoor-air and direct-exposure) are based on a target excess cancer risk of 1×10^{-6} for carcinogens or a target Hazard Quotient of 1 for non-carcinogenic risk. Soil screening levels for potential leaching concerns are intended to prevent impacts to groundwater above target groundwater goals (e.g., drinking water standards). Groundwater screening levels for the protection of aquatic habitats are based on promulgated surface water standards (or equivalent). Screening for nuisance concerns is intended to address potential odor and other aesthetic issues.

10. **Risk Assessment and Management Measures:** Human health risks are within an acceptable range when at or below a cumulative hazard index of 1.0 or for non-carcinogens and at or below a cumulative excess cancer risk of 10⁻⁶ for carcinogens. Management measures including engineering controls (such as engineered caps or wellhead treatment) and institutional controls (such as deed restrictions that prohibit certain land uses) can reduce risk levels. The following risk management measures have been implemented.

- a. **Water Supply Well Decommissioning:** To eliminate potential exposure to VOCs in groundwater, the Responsible Parties offered to decommission 11 water supply wells identified downgradient of the Source Property during the Remedial Investigation (ERM 2004). When given consent, these wells were filled with pressurized grout to seal the well from further use. Three of the wells were either not decommissioned or the status of the well is unknown: (1) the well at 1200 Thames Drive was not decommissioned because the owner did not provide consent; according to the owner, this well was not being used; (2) the well at 1006 Stimel Drive could not be located; and (3) the well at 1038 Bermuda Drive was allegedly destroyed in August 2007, but documentation that it was decommissioned could not be located.

Drinking water for residents is supplied by the Contra Costa Water District and is not impacted by contaminated groundwater.

- b. **Well Construction Prohibition:** Contra Costa County issued a Land Use Policy to prohibit the installation of new wells for domestic, potable, agricultural, or industrial uses in the Colony Park neighborhood (and adjoining areas) until the Regional Water Board verifies that the chemicals of concern have declined to acceptable levels (Land Use Policy - Prohibition of New Private Drinking and Agricultural Water Wells in the Hookston Station / Colony Park Area Located in Concord / Pleasant Hill; Policy No. 07-001, Effective March 1, 2007, Revised March 29, 2007 [Contra Costa County Environmental Health]).
- c. **Vapor Intrusion Mitigation:** VIMS were installed at seven residences where TCE exceeded the screening level. The status and maintenance of these systems are documented in annual indoor air monitoring reports.

11. **Responsible Parties:** Daniel C. Helix, John V. Hook, Nancy Ellicock, and Steven Pucell are deceased and this amendment removes them as Responsible Parties. Karen Hook and Debbie Hook have succeeded to John V. Hook's ownership interest in the Source Property. Blake Pucell has succeeded to Steven Pucell's interest in the Source Property. This amendment, therefore, names Karen Hook, Debbie Hook, and Blake Pucell as Responsible Parties because they collectively own the western portion of the Source Property, have knowledge of the continuing

discharges at the Site, and the ability to control the discharges. This amendment also reflects the dissolution of the Contra Costa Redevelopment Agency. Assets and responsibilities have transitioned from the Contra Costa Redevelopment Agency to its successor, Contra Costa County. Union Pacific Railroad remains a Responsible Party.

12. **Human Right to Drinking Water:** It is the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. The human right to water extends to all Californians, including disadvantaged individuals and groups and communities in rural and urban areas. This amendment promotes that policy by requiring discharges to meet maximum contaminant levels designed to protect human health and ensure that water is safe for domestic use.
13. **CEQA:** The project is exempt from the provisions of the California Environmental Quality Act (CEQA) under the general rule that “CEQA applies only to projects that have the potential for causing a significant effect on the environment.” (Cal. Code Regs., tit. 14 § 15061, subd. (b) (3).) The project is the adoption of this order (amended site cleanup requirements) and the actions to be taken by the dischargers to comply with this order, namely implementing additional cleanup plan and conducting monitoring activities. The activities are intended to support site cleanup and will not have significant environmental effects because it involves in-situ remediation with benign or non-reactive chemicals and the replacement of some contaminated soil with clean fill at an industrial facility.
14. **Notification:** The Regional Water Board has notified the Responsible Parties and all interested agencies and persons of its intent to amend the 2007 Order and has provided them with an opportunity to submit their written comments on the amendment.

IT IS HEREBY ORDERED, the 2007 Order is amended as follows:

- A. **RESPONSIBLE PARTIES.** The 2007 Order is amended to remove the following individuals as named Responsible Parties because they are deceased: Daniel C. Helix, John V. Hook, Nancy Ellicock, and Steven Pucell. Their successors-in-interest Karen Hook, Debbie Hook, and Blake Pucell are named as Responsible Parties as of the effective date of this amendment. The 2007 Order is amended to replace Contra Costa Redevelopment Agency with Contra Costa County as a Responsible Party as of the effective date of this amendment. Union Pacific Railroad remains a Responsible Party.
- B. **CLEANUP LEVELS.** The cleanup standards in the 2007 Order are revised in their entirety and augmented as follows:
 1. **Soil Cleanup Levels:** Soil cleanup levels are based on commercial/industrial land use and are intended to prevent leaching of contaminants to

groundwater within acceptable residual risk to humans. The targeted level is the drinking water resource target which is based on the Tier 1 ESL. The following soil cleanup levels shall be met in all vadose-zone soils:

Constituent	Concentration (mg/kg)	Basis
TCE	0.085	Leaching to groundwater (Drinking Water)
cis-1,2-DCE	0.19	Leaching to groundwater (Drinking Water)
trans-1,2-DCE	0.65	Leaching to groundwater (Drinking Water)
1,1-DCA	0.2	Leaching to groundwater (Drinking Water)
1,2-DCA	0.007	Leaching to groundwater (Drinking Water)
Vinyl Chloride	0.0015	Leaching to groundwater (Drinking Water)

2. **Groundwater Cleanup Levels:** The groundwater cleanup levels for the Site are based on applicable water quality objectives and are the more stringent of EPA and California primary maximum contaminant levels (MCLs) to protect beneficial uses of groundwater within an acceptable residual risk to humans. The following groundwater cleanup levels shall be met in all wells identified in, and potentially added to, the attached SELF-MONITORING PROGRAM (Attachment A):

Constituent	Concentration (ug/L)	Basis
TCE	5	MCL
cis-1,2-DCE	6	MCL
trans-1,2-DCE	10	MCL

Constituent	Concentration (ug/L)	Basis
1,1-DCA	5	MCL
1,2-DCA	0.5	MCL
1,1-DCE	6	MCL
Vinyl chloride	0.5	MCL

3. **Onsite/Source Property Soil Vapor Cleanup Levels:** The soil vapor cleanup levels for the Source Property are intended to prevent vapor intrusion into occupied buildings and will result in acceptable residual risk to humans. Since land use at the Source Property is anticipated to remain commercial/industrial, the following soil vapor cleanup levels shall be met in all Source Property (onsite) vadose-zone soils.

Constituent	Concentration (ug/m³)	Basis (commercial / industrial sites)
TCE	100	Human health – vapor intrusion
cis-1,2-DCE	1,200	Human health – vapor intrusion
trans-1,2-DCE	12,000	Human health – vapor intrusion
1,1-DCA	260	Human health – vapor intrusion
1,2-DCA	16	Human health – vapor intrusion
Vinyl Chloride	5.2	Human health – vapor intrusion

4. **Offsite/Downgradient Area Soil Vapor Cleanup Levels:** Since the downgradient land affected by pollution from the Source Property includes residential properties, the following soil vapor cleanup levels shall be met in all impacted downgradient areas (offsite) vadose-zone soils.

Constituent	Concentration (ug/m ³)	Basis (residential)
TCE	16	Human health – vapor intrusion
cis-1,2-DCE	280	Human health – vapor intrusion
trans-1,2-DCE	2,800	Human health – vapor intrusion
1,1-DCA	58	Human health – vapor intrusion
1,2-DCA	3.6	Human health – vapor intrusion
Vinyl Chloride	0.32	Human health – vapor intrusion

5. **Onsite/Source Property Indoor Air Cleanup Levels:** The indoor air cleanup levels for the Source Property are intended to prevent unhealthy levels of VOCs in indoor air as a results of vapor intrusion. Since land use at the Source Property is anticipated to remain commercial/industrial, the following indoor air cleanup levels shall be met in occupied Source Property (onsite) buildings.

Constituent	Concentration (ug/m ³)	Basis (commercial / industrial)
TCE	3	Direct exposure – cancer risk
cis-1,2-DCE	35	Direct exposure – non cancer hazard

Constituent	Concentration (ug/m³)	Basis (commercial / industrial)
trans-1,2-DCE	350	Direct exposure – non cancer hazard
1,1-DCA	7.7	Direct exposure – cancer risk
1,2-DCA	0.47	Direct exposure – cancer risk
Vinyl Chloride	0.16	Direct exposure – cancer risk

6. **Offsite/Downgradient Area Indoor Air Cleanup Levels:** The indoor air cleanup levels for the Site are intended to prevent unhealth levels of VOCs in indoor air as a results of vapor intrusion. Land use downgradient of the Source Property is residential and the following indoor air cleanup levels shall be met in residential, occupied, downgradient area (offsite) buildings.

Constituent	Concentration (ug/m³)	Basis (residential)
TCE	0.48	Direct exposure – cancer risk
cis-1,2-DCE	8.3	Direct exposure – non cancer hazard
trans-1,2-DCE	83	Direct exposure – non cancer hazard
1,1-DCA	1.8	Direct exposure – cancer risk
1,2-DCA	0.11	Direct exposure – cancer risk
Vinyl Chloride	0.0095	Direct exposure – cancer risk

C. **TASKS.** The 2007 Order is amended to include the following new tasks:

1a. ALTERNATIVE REMEDIAL DESIGN AND IMPLEMENTATION PLAN

COMPLIANCE DATE: 90 Days following Order Adoption

Submit an alternative remedial design and implementation plan acceptable to the Executive Officer that updates the October 2022 Revised Plan and evaluates feasible options for remediating groundwater, soil, and soil vapor to meet cleanup levels within a reasonable timeframe. The plan shall describe all significant implementation steps and shall include an implementation schedule to achieve cleanup levels in a reasonable timeframe. The plan shall adequately address the following:

- The methods proposed in the *2022 October Revised Plan* exceed acceptability for a reasonable timeframe. The alternative remedial design and implementation plan should propose a revised cleanup plan that meets cleanup levels within a reasonable timeframe. This is described further in Finding 5.
- For onsite soil excavation, the *October 2022 Revised Plan* applies soil cleanup levels that address a groundwater target to prevent leaching of contaminants to groundwater within an acceptable residual risk to humans. The required plan shall consider a groundwater target for drinking water beneficial use (MCLs).
- The *October 2022 Revised Plan* states that field testing and confirmation sampling procedures will be detailed in a Soil Excavation Quality Control Plan.

1b. IMPLEMENT REMEDIAL DESIGN AND IMPLEMENTATION PLAN

COMPLIANCE DATE: 180 days after required by the Executive Officer

Implement the remedial design and implementation plan. In addition, submit quarterly progress reports or, if approved by the Executive Officer, milestone reports as proposed by the Responsible Parties to demonstrate progress through phases of the approved implementation plan described in Task 1 of this amendment. Reports shall be acceptable to the Executive Officer and include the following components:

- a. Figure(s) showing sampling locations and analytical results.
- b. Description of field activities.

- c. Documentation/field notes of the remedial activities and quality assurance procedures.
- d. Summary tables(s) of analytical results
- e. Evaluation of analytical results.
- f. Conclusions and recommendations for next steps.

1c. REMEDIAL ACTION COMPLETION REPORT

COMPLIANCE DATE: 90 Days after completion of Task 1B

Submit a report update verifying the completion of each phase of the approved implementation plan described in Task 1 of this amendment. The report shall be acceptable to the Executive Officer and include the following components:

- a. Figure(s) showing sampling locations and analytical results.
- b. Description of field activities.
- c. Documentation/field notes of the remedial activities and quality assurance procedures.
- d. Summary tables(s) of analytical results
- e. Evaluation of analytical results and an evaluation of remedial effectiveness.
- f. Conclusions and recommendations for next steps.

2. INDOOR AIR MONITORING WORKPLAN

COMPLIANCE DATE: 90 Days following Order Adoption

Submit a workplan for evaluating vapor intrusion at the following three residences: 1056 Bancroft Road, 1064 Bancroft Road, and 1200 Hookston Road. The work plan shall propose modifications to the Self-Monitoring Program if sub-slab and indoor air sampling at these residences is not feasible. Proposed modifications to the Self-Monitoring Program must include a schedule with at least two seasonal monitoring events, demonstrate that vapor intrusion concerns have been addressed, and include a plan for disseminating human health risk information to these residences. The work plan shall be acceptable to the Executive Officer.

3. EVALUATION OF REMEDIAL EFFECTIVENESS OF ALTERNATIVE REMEDIAL DESIGN AND IMPLEMENTATION PLAN

COMPLIANCE DATE: Two years after the completion of Task 1c, and every two years thereafter

Submit a report acceptable to the Executive Officer evaluating the effectiveness of the approved alternative remedial design and implementation plan. The report shall include the following elements:

- a. Summary of the effectiveness of remedial actions at controlling contaminant migration and protecting human health and the environment (i.e., water quality and its beneficial uses).
- b. Comparison of contaminant concentrations to cleanup levels with an analysis of data trends.
- c. Comparison of anticipated versus actual costs of cleanup activities.
- d. Evaluation of the performance of remedial actions or systems with specific data (e.g., groundwater volume extracted, chemical mass removed, mass removed per million gallons extracted).
- e. Discussion of the cost effectiveness of remediation with specific data (e.g., cost per pound of contaminant removed).
- f. Summary of significant modifications or changes made to remedial actions or systems that effected operation.
- g. Provide new data collected through additional investigation or assessment of remedial actions or systems, as applicable.
- h. Discuss whether additional remedial actions may be needed to meet cleanup levels and (if applicable) propose a time schedule for implementation.

4. PROPOSE ALTERNATIVE CLEANUP STRATEGY

COMPLIANCE DATE: 90 days after evaluation report required by Executive Officer

If cleanup levels have not been met and are not projected to be met within a reasonable time after implementing the alternative remedial design and implementation plan, submit a report that assesses the technical

practicability of meeting cleanup levels and any alternative cleanup strategy.

5. PROPOSE VAPOR MITIGATION CURTAILMENT

COMPLIANCE DATE: 60 days prior to proposed curtailment

Submit a vapor mitigation curtailment plan acceptable to the Executive Officer containing a proposal to curtail vapor mitigation systems. The curtailment proposal must include the following:

- a. Justification;
- b. Notification procedures;
- c. Curtailment procedures;
- d. Steady-state vapor concentrations (active systems only);
- e. Sampling plan;
- f. Restart procedures; and
- g. Schedule

Self-Monitoring Program: The 2007 Order's Self-Monitoring Program, as amended, shall be replaced by the Self-Monitoring Program attached to this amendment. The Responsible Parties shall comply with the new Self-Monitoring Program, as may be amended by the Executive Officer.

I do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on [date].

Eileen White
Executive Officer

Attachments:

Site Map and A-Zone Groundwater Map
Site Map and B-Zone Groundwater Map
Self-Monitoring Program

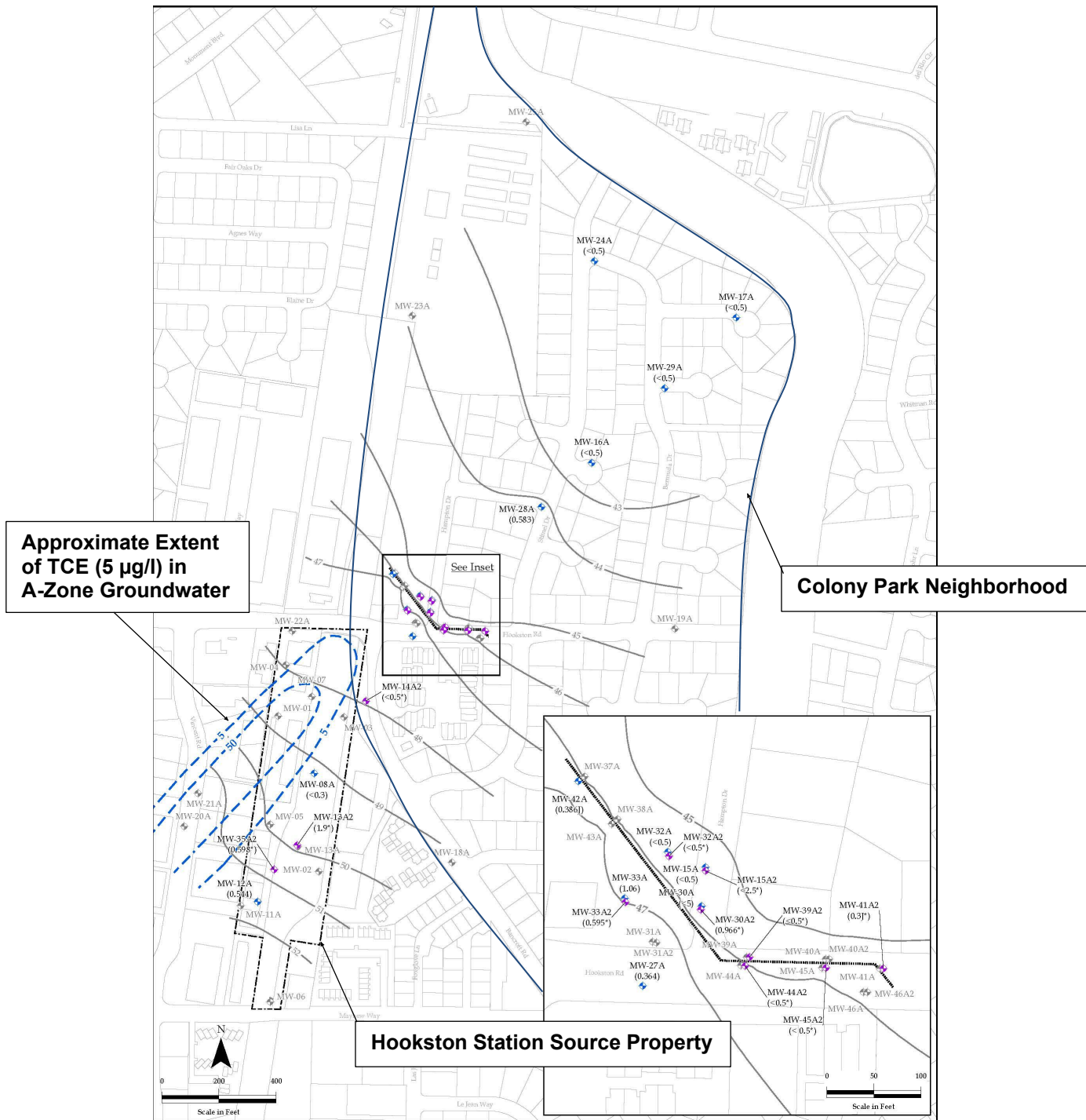


Figure 1: Site Map and A-Zone Groundwater

Map shows the location of the Hookston Station Site (dashed, black line), the Colony Park neighborhood (solid blue lines), and A-Zone groundwater elevations (solid gray lines) with the approximate extent of the TCE plume (dashed, blue lines) based on 2021 monitoring and sampling data.

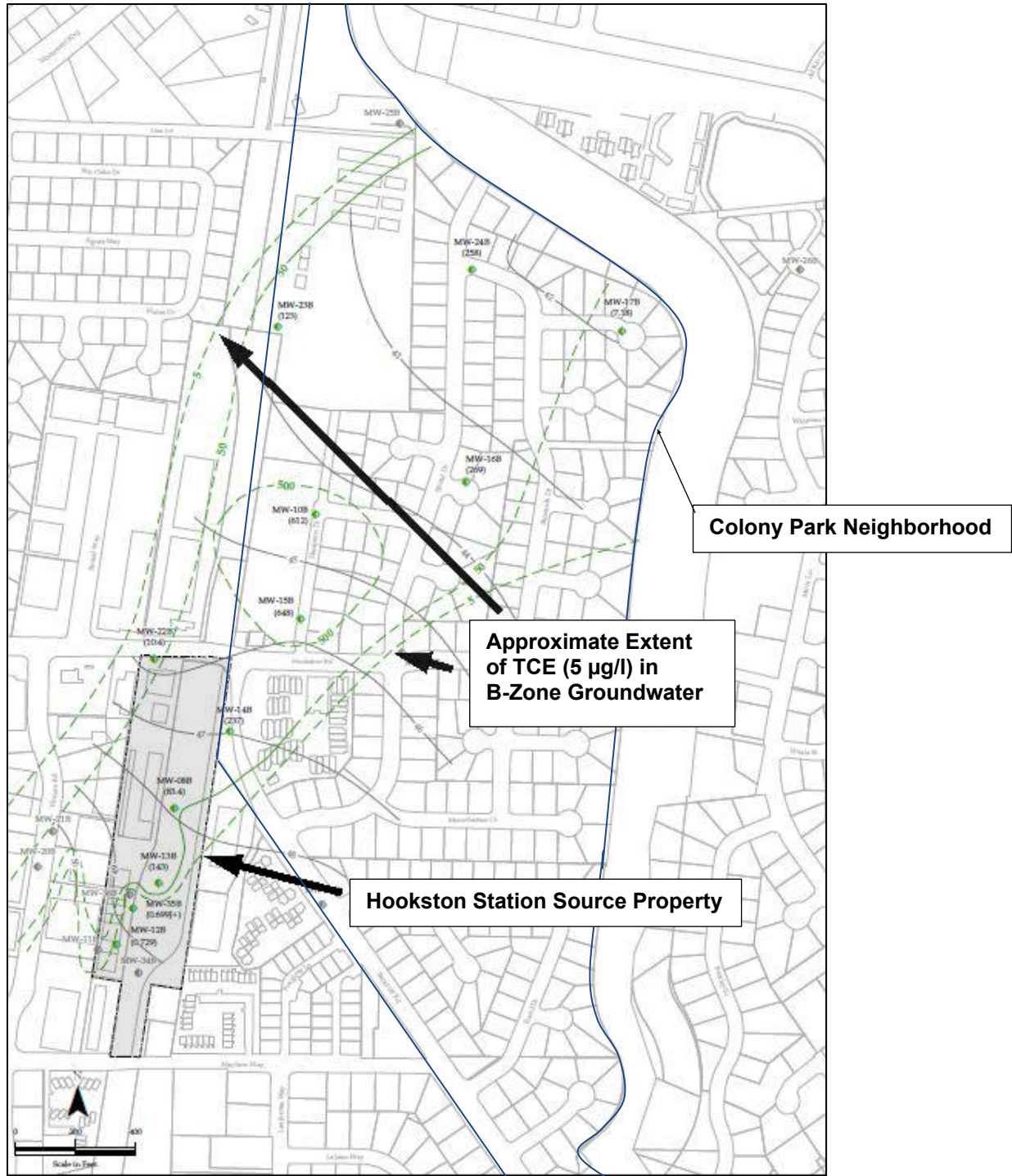


Figure 2: Site Map and B-Zone Groundwater

Map shows the location of the Hookston Station Site (dashed, black line), the Colony Park neighborhood (solid blue lines), and B-Zone groundwater elevations (solid gray lines) with the approximate extent of the TCE plume (green solid and dashed lines) based on 2021 monitoring and sampling data.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM for:

*UNION PACIFIC RAILROAD COMPANY,
MARY LOU HELIX, KAREN HOOK, DEBBIE HOOK, AND BLAKE PUCCELL,
AND CONTRA COSTA COUNTY*

For the property referred to as:

HOOKSTON STATION

and located at:

*228 HOOKSTON ROAD
PLEASANT HILL, CONTRA COSTA COUNTY*

1. **Authority and Purpose:** The Regional Water Board requires monitoring and the submittal of technical reports identified in this Self-Monitoring Program pursuant to Water Code sections 13267 and 13304. This Self-Monitoring Program is intended to document compliance with Regional Water Board Order No. R2-2007-0009, as amended by Order 2022-XXXX (site cleanup requirements).

Water Code section 13267(b)(1) states that the burden, including costs, of the report shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the report. Given the existing and threatened impacts to groundwaters, soil, and indoor air, the need for these reports is high. They are essential to ensuring effective cleanup, restoration of beneficial uses, and the protection of human health. The burden of preparing these reports, which includes the costs of consultants' work and of the Regional Water Board's review, is reasonable in comparison to the reports' necessity and the benefits they will provide.

2. **Groundwater and Soil Vapor Monitoring:** The Responsible Parties shall measure groundwater elevations biannually in all monitoring wells, and shall collect and analyze representative samples of groundwater and soil vapor according to the following tables:

Groundwater Monitoring

Notes:

A – Annually

SA – Semi-annually

Analyze soil vapors for VOCs by USEPA Method TO-15

Analyze groundwater for VOCs by USEPA Method 8260B

Well	Sampling Frequency	Well	Sampling Frequency	Well	Sampling Frequency
A-Zone Groundwater					
MW-03	Biennial	MW-08A	Biennial	MW-11A	SA for 5 years after injections, then A
MW-12A	SA for 5 years after injections, then A	MW-13A2	SA for 5 years after injections, then A	MW-14A2	SA for 5 years after injections, then A
MW-15	Biennial	MW-15A2	SA for 5 years after injections, then A	MW-16A	SA for 5 years after injections, then A
MW-17A	SA for 5 years after injections, then A	MW-24A	SA for 5 years after injections, then A	MW-27A	SA for 5 years after injections, then A
MW-28A	SA for 5 years after injections, then A	MW-29A	SA for 5 years after injections, then A	MW-30A/A2	SA for 5 years after injections, then A
MW-32A/A2	SA for 5 years after injections, then A	MW-33A/A2	SA for 5 years after injections, then A	MW-35A2	SA for 5 years after injections, then A
MW-39A2	SA for 5 years after injections, then A	MW-41A2	SA for 5 years after injections, then A	MW-42A	SA for 5 years after injections, then A
MW-43A	SA for 5 years after injections, then A	MW-44A2	Biennial	MW-45A2	Biennial
MW-46A/A2	SA for 5 years after injections, then A				
B-Zone Groundwater					

Well	Sampling Frequency	Well	Sampling Frequency	Well	Sampling Frequency
MW-08B	SA for 5 years after injections, then A	MW-10B	Biennial	MW-11B	SA for 5 years after injections, then A
MW-12B	SA for 5 years after injections, then A	MW-13B	SA for 5 years after injections, then A	MW-14B	SA for 5 years after injections, then A
MW-15B	SA for 5 years after injections, then A	MW-16B	SA for 5 years after injections, then A	MW-17B	SA for 5 years after injections, then A
MW-22B	Biennial	MW-23B	SA for 5 years after injections, then A	MW-24B	SA for 5 years after injections, then A
MW-35B	Biennial				
C-Zone Groundwater					
MW-15C	Biennial				

Soil Vapor Monitoring

Soil Vapor Probe	Depth (Feet)	Sampling Frequency
SVP-1	5	A
SVP-2	5	A
SVP-3	5	A
SVP-4	5	A
SVP-5R	5	A
SVP-6	5	A
SVP-11	5	A
SVP-14	5	A

Soil Vapor Probe	Depth (Feet)	Sampling Frequency
SVP-15-5R	5	A
SVP-15-10R	10	A
SVP-16-10	10	A
SVP-17-5	5	A
SVP-17-10	10	A

Additional analytes shall be analyzed in accordance with the approved revision to the October 2022 Revised Plan.

The Responsible Parties shall sample any new monitoring or extraction wells quarterly and analyze groundwater and soil vapor samples for the same constituents as shown in the above table. The Responsible Parties may propose changes in the above table; any proposed changes are subject to Executive Officer approval.

3. **Indoor air monitoring:** The Responsible Parties shall perform indoor air sampling and analysis at the residences identified in Figure 1 in accordance with the Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (DTSC, February 2011). The sampling program shall include the following:

- Samples shall be collected from the first floors of all homes and also from the second floors of two-story homes.
- Samples shall be analyzed using USEPA Method TO-15 SIM, which includes the chemicals that originate from the Hookston Station Site. Method TO-15 SIM also includes PCE, which does not originate from the Hookston Station Site.
- At least two sampling events shall include the collection and analysis of crawl space air samples for homes with crawl spaces. Crawl space air samples are not required for homes with installed vapor intrusion prevention systems or homes for which two sampling events have already included crawl spaces.
- Samples shall be collected over a 24-hour period using calibrated flow controllers or other, equivalent technologies.

- Outdoor air temperatures shall be recorded at the beginning and end of the sampling period; Weather Service information regarding local temperatures may also be reported.
- Residents shall be asked, but not required, to keep windows and doors closed in the room containing the sampling device for the duration of the sampling.
- Ambient air samples shall be collected during each sampling day.
- Petroleum-related compounds, which do not originate from the Hookston Station Site, may be excluded from data tables in monitoring reports, but shall be included in the laboratory reports.

The Responsible Parties shall continue indoor air sampling and analysis annually for all single-family residences identified in Figure 1 that have been regularly sampled and for which access has been provided for indoor air sampling. These homes are generally located above the 500 micrograms per liter ($\mu\text{g/L}$) TCE groundwater iso-concentration contour in the A-Zone (based on historical data). Indoor air monitoring shall be conducted during the summer dry season by the end of the third quarter or September 30.

The Responsible Parties shall assist Regional Water Board to send letters requesting access. The Responsible Parties shall meet with Regional Water Board, as needed, to discuss adjustments to the sampling area boundaries and sampling frequencies based upon the data collected during the previous year.

4. **Vapor Intrusion Prevention System Monitoring:** The Responsible Parties shall visually inspect (and repair if needed) all houses with installed vapor intrusion prevention systems and within the indoor air study area, as shown on Figure 1, annually to ensure that the mechanical equipment is in good condition and operating properly and that the crawl space vapor barrier remains intact and is not punctured.
5. **Monitoring Reports:** The Responsible Parties shall submit monitoring reports to the Regional Water Board no later than 30 days following the end of the biannual period (e.g., report for the first biannual period of the year is due by July 30). The reports shall include:
 - a. **Transmittal Letter:** The transmittal letter shall discuss any violations during the reporting period and actions taken or planned to correct the problem. The letter shall be signed by the Responsible Parties' principal executive officer or his/her duly authorized representative, and shall include a statement by the official, under penalty of perjury, that the report is true and correct to the best of the official's knowledge.

- b. Groundwater Elevations: Groundwater elevation data shall be presented in tabular form, and a groundwater elevation map shall be prepared for each monitored water-bearing zone. Historical groundwater elevations shall be included in each report.
- c. Groundwater Analyses: Groundwater sampling data shall be presented in tabular form, and an isoconcentration map shall be prepared for one or more key contaminants for each monitored water-bearing zone, as appropriate. The report shall indicate the analytical method used, detection limits obtained for each reported constituent, and a summary of QA/QC data. Historical groundwater sampling results shall be included in each report. The report shall describe any significant increases in contaminant concentrations since the last report, and any measures proposed to address the increases. Supporting data, such as lab data sheets, need not be included (however, see record keeping - below).
- d. Soil Vapor Analyses: Soil vapor sampling data shall be presented in each vapor monitoring report. Data shall be presented in tabular form, and an iso-concentration map should be prepared for one or more key contaminants. The report shall indicate the analytical method used, detection limits obtained for each reported constituent, and a summary of QA/QC data. Historical soil vapor sampling results shall be included in the annual monitoring report each year. The report shall describe any significant changes in contaminant concentrations since the last report, and any measures proposed to address increases. Supporting data, such as lab data sheets, need not be included (however, see record keeping- below).
- e. Indoor Air Analyses: The results for the annual indoor air sampling events shall be presented in the report for the fourth quarter each year. Indoor air sampling data shall be presented in tabular form and a map prepared for one or more key contaminants, as appropriate. The report shall indicate the analytical method used, detection limits obtained for each reported constituent, and a summary of QA/QC data. The report shall describe any significant changes in contaminant concentrations since the last report, and any measures proposed to address any increases. Supporting data, such as lab data sheets, need not be included (however, see record keeping- below).
- f. Visual Monitoring of Vapor Intrusion Prevention Systems: Results of visual monitoring of vapor intrusion prevention systems shall be included in the report for the fourth quarter each year. Any deficiencies and measures taken to correct those deficiencies shall also be described.

- g. Status Report: The biannual report shall describe relevant work completed during the reporting period (e.g., site investigation, interim remedial measures) and work planned for the following biannual period.
- 6. **GeoTracker Reporting:** Pursuant to Title 23, Division 3, Chapter 30, Articles 1 and 2, Sections 3890-3895 of the California Code of Regulations, the Responsible Parties shall submit the following information electronically to the State Water Board's GeoTracker database:
 - a. All chemical analytical results for soil, water, and vapor samples;
 - b. The latitude and longitude of any permanent sampling point for which data is reported, accurate to within 1 meter and referenced to a minimum of two reference points from the California Spatial Reference System, if available;
 - c. The surveyed elevation relative to a geodetic datum of any permanent sampling point;
 - d. The elevation of groundwater in any permanent monitoring well relative to the surveyed elevation;
 - e. A Site map or maps showing the location of all sampling points;
 - f. The depth of the screened interval and the length of screened interval for any permanent monitoring well;
 - g. PDF copies of boring logs; and,
 - h. PDF copies of all reports, work plans, and other documents, including the signed transmittal letter and professional certification by a California Licensed Civil Engineer or Professional Geologist.
- 7. **Violation Reports:** If the Responsible Parties violate requirements in the Site Cleanup Requirements, then the Responsible Parties shall notify the Regional Water Board office by telephone as soon as practicable once the Responsible Parties have knowledge of the violation. The Regional Water Board may, depending on violation severity, require the Responsible Parties to submit a separate technical report on the violation within five working days of telephone notification.
- 8. **Other Reports:** The Responsible Parties shall notify the Regional Water Board in writing prior to any Site activities such as removal or installation of any subsurface facilities, which have the potential to cause further migration of contaminants or which would provide new opportunities for site investigation.

9. **Record Keeping:** The Responsible Parties or their agent shall retain data generated for the above reports, including lab results and QA/QC data, for a minimum of six years after origination and shall make them available to the Regional Water Board upon request.
10. **Self-Monitoring Program Revisions:** Revisions to the Self-Monitoring Program may be ordered by the Executive Officer, either on his/her own initiative or at the request of the Responsible Parties.

FIGURE 1

ANNUAL INDOOR AIR STUDY AREA

HOOKSTON STATION



Legend
 Homes with vapor intrusion prevention system installed
 Indoor air study area boundary
 Parcel boundaries

Figure 1
*Colony Park Neighborhood
 Indoor Air Study Area
 Hookston Station
 Pleasant Hill, California*

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