

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

STAFF SUMMARY REPORT (Mary Rose Cassa)
MEETING DATE: January 23, 2007

ITEM: 12

SUBJECT: **Union Pacific Railroad Company, Daniel C. and Mary Lou Helix, Elizabeth Young, John V. Hook, Nancy Ellicock, Steven Pucell, and Contra Costa County Redevelopment Agency for the Property Referred to as Hookston Station and Located at 228 Hookston Road, Pleasant Hill, Contra Costa County – Adoption of Final Site Cleanup Requirements.**

CHRONOLOGY: April 2003 – Board issued site cleanup requirements
January 2004 – Board heard status report
September 2004 – Board amended site cleanup requirements

DISCUSSION: Hookston Station is located at the intersection of Hookston and Bancroft Roads in Pleasant Hill (see Appendix D – Map). The site covers about 8 acres and is currently occupied by mixed commercial and light industrial businesses. Former tenants used and released the chlorinated solvent trichloroethene (TCE), which has contaminated both soil and groundwater beneath the site. The groundwater contamination plume extends more than 2,000 feet offsite to the northeast, beneath a residential area. Contaminated groundwater has impacted backyard wells and has resulted in intrusion of chlorinated solvent vapors into some homes located above the contaminated groundwater.

The Board adopted site cleanup requirements in 2003 naming Union Pacific Railroad, Contra Costa County Redevelopment Agency, Dan Helix, and other current landowners as responsible parties. For clarification, none of the named responsible parties used or released chemicals at the site.

The 2003 Board order required the dischargers to complete ten tasks, leading up to and including a draft cleanup plan. In July 2006, the dischargers submitted a draft cleanup plan, which was approved by the Executive Officer on November 2, 2006, following a 30-day comment period and various public participation measures.

The Revised Tentative Order (Appendix A) sets cleanup standards and requires the responsible parties to implement the approved cleanup plan. The cleanup plan includes the following items:

- A zero-valent iron permeable reactive barrier downgradient of Hookston Station to reduce the chlorinated solvent concentrations in the A-Zone (most shallow) ground water,
- Chemical oxidation for B-Zone ground water,
- Institutional controls for a single location of arsenic-impacted subsurface soil on the Hookston Station Parcel in the form of a soil management plan,
- Vapor intrusion prevention systems at affected residences,
- Removal of private wells from residences that overlie the A-Zone and B-Zone groundwater plumes, and
- Institutional controls to restrict future development of water supplies within the impacted area until final ground water cleanup goals are achieved.

We received comments from the Colony Park Neighbors Association, individual homeowners within Colony Park, a consultant representing two of the dischargers (Union Pacific and Mr. Helix), and Mr. Helix (Appendix B). Some comments were related to the cleanup plan and were addressed previously in our response to comments for the approval of the cleanup plan. Other comments were related to the remedial design and will be addressed during the design phase. Still other comments focused on the schedule and location of shallow-groundwater cleanup activities. We have revised the original tentative order to address requested changes where appropriate, and have prepared responses for the key comments (Appendix C).

We expect that one or more interested persons may wish to testify at the Board hearing, although at this point we are not sure which specific issues might be raised. We will provide a basic overview of the case in the staff presentation and will be prepared to respond to any public testimony.

**RECOMMEN-
DATION:**

Adopt the Revised Tentative Order.

File No:

07S0156 (MRC)

Appendices:

- A. Revised Tentative Order
- B. Correspondence
- C. Response to Comments
- D. Site Location Map

Appendix A - Revised Tentative Order

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

REVISED TENTATIVE ORDER

ADOPTION OF FINAL SITE CLEANUP REQUIREMENTS AND RESCISSION OF ORDER NOS. R2-2003-0035 AND R2-2004-0081 FOR:

UNION PACIFIC RAILROAD COMPANY
DANIEL C. and MARY LOU HELIX, ELIZABETH YOUNG, JOHN V. HOOK, NANCY
ELLI COCK, STEVEN PUCELL,
AND CONTRA COSTA COUNTY REDEVELOPMENT AGENCY

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 Board), finds that:

- 1. Site Location:** The Hookston Station site (herein referred to as “the Site”) is located at the intersection of Hookston and Bancroft Roads in Pleasant Hill, California (Attachment A, Figure 1, Site Location Map). The Site covers approximately 8 acres, and the area is currently occupied by mixed commercial and light industrial businesses. Commercial industries are located immediately to the west of the property, and storage and landscape materials businesses are located to the north. A high-density housing complex is present immediately across the northeast edge of the property. Land use in the Site vicinity is a mixture of residential and commercial.
- 2. Site History:** The Site was owned and operated by Southern Pacific Transportation Company (SPTCo) from June 1891 until September 1983 as a portion of the San Ramon Branch line, which once connected Avon to San Ramon, California. The Site included a freight loading platform with railroad sidings and was used for loading of fruit and lumber. Between approximately 1965 and 1983, the land was developed into a mixed light industrial business complex. A former tenant at the Site, E-T Industries, Inc. (formerly known as Wheel Centre, Inc., and also known as “ET Mags”) and Cal-Motive Industries, Inc. (also once known as “ET Mags”), manufactured chrome and alloy wheels and used trichloroethylene (TCE), a chlorinated solvent. ET Mags went into bankruptcy and is no longer in existence. The property was transferred from SPTCo 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. The western portion of the Site is currently owned by Mr. and Mrs. Dan Helix, Ms. Elizabeth Young, Mr. John V. Hook, Ms. Nancy Ellicock, and Mr. Steven Pucell (collectively the Hookston Plaza owners). CCCRA owns the eastern portion of the Site.

Environmental investigations regarding the presence of chemicals in soil and ground water at the Site were conducted between 1989 and 1996 by various environmental consulting firms on behalf of CCCRA and the Hookston Plaza owners. These investigations discovered the presence of both petroleum-based products and chlorinated solvents in soil and groundwater at the Site. Several recent studies have included a soil vapor study, soil and groundwater sampling, indoor air sampling, and a human health risk assessment.

The initial environmental investigations by Harding Lawson Associates (HLA, January 1990 and June 1990) were completed for the Contra Costa County Public Works Department (on behalf of CCCRA) in support of the proposed purchase by CCCRA of the eastern portion of the property. Following the discovery of chemical impacts to soil and ground water at the Site, Engeo, Inc. (1991 to 1992) and Treadwell & Rollo, Inc. (1993 to 1996) performed additional investigations on behalf of the Hookston Plaza owners. These later investigations were performed to support pending litigation between the Hookston Plaza owners, CCCRA, SPTCo, and others. Union Pacific Railroad (UPRR) assumed SPTCo's responsibilities for this Site following its merger with SPTCo in 1997.

3. **Named Responsible Parties:** UPRR is named as a Responsible Party because it is the successor in interest to SPTCo, which owned the 8-acre property during or after the time of the activities that resulted in the discharge, and had the legal ability to prevent the discharge. CCCRA is named as a Responsible Party because it owned the eastern portion of the 8-acre property during or after the time of the activities that resulted in the discharge, has knowledge of the discharge or the activities that caused the discharge, and has the legal ability to prevent the discharge. The Hookston Plaza owners are named as Responsible Parties because they owned the 8-acre property during or after the time of the activities that resulted in the discharge, have knowledge of the discharge or the activities that resulted in the discharge, and have the legal ability to prevent the discharge.¹

¹ The current owners of the property (CCCRA and Hookston Plaza) have the legal authority to prevent the ongoing discharge of pollutants to groundwater. On-going migration of contaminants through leaching from soil into groundwater and movement with the groundwater is also considered a release of contaminants to the environment. The State Board has adopted various orders (e.g., Zoecon Corp (WQ 86-2); Spitzer (WQ 89-8)) that establish that owners are responsible for discharges that are currently occurring on their property, even if the initial discharge occurred before they owned it or was caused by someone else (frequently a lessee).

If additional information is submitted indicating that other parties caused or permitted any waste to be discharged on the site where it entered or could have entered waters of the State, the Board will consider adding those parties' name to this Order.

4. Regulatory Status: This site was subject to the following Board orders:

Site Cleanup Requirements Order NO. R2-2003-0035 adopted April 16, 2003, as amended by Order NO. R2-2004-0081, adopted September 15, 2004.

5. Site Hydrogeology: Previous investigations have identified three apparently distinct hydrogeologic zones, based on the observed stratigraphy, occurrence of groundwater, and general water quality. The zones are defined by hydrogeology, and the specific depths vary accordingly. Fine-grained clays and silts are present from the ground surface (or immediately below the ground surface cover materials) to depths up to 40 ft bgs. This zone, identified as the A-Zone, contains discontinuous lenses of sands, silty sands, and gravelly sands that are interbedded in the fine-grained deposits. The coarser grained lenses range in thickness from a few inches to approximately 11 ft, but are more commonly only a few feet thick.

Beneath the A-Zone is the B-Zone, between the approximate depths of 30 and 70 ft bgs, a relatively continuous sand unit that is interbedded with silt and clay lenses. The sands of the B-Zone are generally 5 to 10 ft thick and range from well-sorted sands and clayey sands to gravelly sands. A few gravel zones are also encountered in the B-Zone. The silt and clay lenses within the B-Zone are up to 10 ft thick, but are generally less than a few feet thick. A clay unit that is 10 to 40 ft thick is present at the base of the B-Zone.

The C-Zone lies beneath the B-Zone and is initially encountered at depths ranging from 65 to 97 ft bgs. The C-Zone is also a continuous sand unit that is interbedded with silt and clay lenses. The C-Zone has not been characterized deeper than 100 ft bgs.

Potentiometric ground water levels have historically ranged from approximately 12 to 23 bgs in the A-Zone, 13 to 24 ft bgs in the B-Zone, and 16 to 21 ft bgs in the C-Zone. Groundwater in the three zones generally flows toward the north to northeast. The overall hydraulic gradients in the three zones have typically ranged from 0.001 to 0.004 foot per foot (ft/ft). Based on groundwater level measurements and stratigraphy, the three water-bearing zones are confined to semi-confined.

The nearest surface water body is the Walnut Creek Channel, used for flood control by the Contra Costa County Flood Control District. The creek flows northward for several miles before emptying into the Suisun Bay. It is unlined in the vicinity of the Hookston Station Site and is secured from public access by permanent fencing.

6. **Adjacent Sites:** The western side of the Site is bordered by several commercial and light-industrial properties, including Haber Oil Products Company (also known as Pitcock Petroleum), a petroleum product distribution facility. Soil and groundwater investigations at this facility have indicated impacts by petroleum hydrocarbons. Chlorinated solvents have also been detected in groundwater at Haber Oil. The Board currently requires Haber Oil to collect quarterly groundwater samples for petroleum hydrocarbon and chlorinated solvent analyses. Offsite groundwater investigation by Haber Oil indicates that a plume of methyl tert-butyl ether (MTBE) extends northeastward at least 600 ft from the Haber Oil site. Additional investigation and cleanup are pending.

Soil vapor studies and subsurface investigations conducted in the vicinity of the Site indicate have detected PCE and associated degradation products, including TCE, in groundwater to the west (upgradient) of the Site. These findings indicate that there are offsite sources of VOCs that are migrating onto the Hookston Station Site.

Board staff has requested information from the upgradient off-Site property owners and operators regarding site operations, and has required subsurface investigations at these properties. The investigations indicate there has been a release of PCE at one or more of these off-Site properties. Board staff is working with the upgradient property owners to further investigate the source and extent of the VOCs associated with this release.

7. **Remedial Investigation:** Remedial Investigation (RI) activities were conducted at the Site and in the vicinity of the Site between 1990 and 2004. The investigations were conducted in a phased approach and involved the collection of soil, soil vapor, ground water, surface water, sediment, ambient (outdoor) air, and indoor air samples. Analytical data indicates that dissolved VOCs are primarily observed in the coarse-grained deposits of the A- and B-Zones found above 70 ft bgs. The TCE plume extends about 2,000 feet northeast of the Site, beneath the Colony Park residential neighborhood and to the Walnut Creek Channel.

The RI report, dated August 2004, summarized all subsurface investigations completed to that time, and the FS report, dated July 2006, incorporated additional data acquired after submittal of the RI report. The RI data adequately define the lateral and vertical extent of on-site soil contamination and the lateral and vertical extent of the on- and off-Site portions of the groundwater plume. Additional data are needed to refine our understanding of the occurrence of Site-related chemicals in soil vapor and indoor air.

a. Soil

VOCs have been analyzed in 273 soil samples collected from 86 locations throughout the Site. TCE was the most common VOC detected in soil. Low concentrations of TCE have been reported in soil samples across the Site,

typically in the 100 to 200 micrograms per kilogram ($\mu\text{g}/\text{kg}$) range. The greatest TCE concentration of 2,580 $\mu\text{g}/\text{kg}$ was reported in the southwest portion of the Site, adjacent to where ET Mags formerly operated.

b. Soil Vapor

Passive and active soil vapor surveys were conducted during the RI. During the active soil vapor survey, concentrations of TCE in soil vapor greater than the Environmental Screening Levels (ESLs) were detected at one location at the Site and three locations in the Colony Park neighborhood. The results of this study led to the collection and analysis of indoor air samples (see below). Permanent soil vapor monitoring probes were installed in April 2005 at ten locations in the Colony Park neighborhood, and are sampled on a quarterly basis. Six of these probes are located in areas where TCE concentrations were recently greater than 500 micrograms per liter ($\mu\text{g}/\text{l}$) in A-Zone groundwater (the “core” of the A-Zone groundwater plume). The four remaining vapor probes are located within utility corridors outside the surface “footprint” of the A-Zone and B-Zone groundwater plumes. Additional monitoring points are needed outside the core plume area and on the northwest side of the plume. TCE is the most frequently detected VOC in the soil vapor from probes overlying the core of the A-Zone groundwater plume. PCE, cis-1,2-DCE, vinyl chloride, and benzene have also been detected at concentrations greater than their respective ESLs at one or more locations. PCE and benzene do not originate from the Hookston Station site.

c. Groundwater

Quarterly groundwater monitoring has been performed at the Site using the 44 wells within the monitoring network. Maximum concentrations of the most common VOCs detected in ground water monitoring wells either on or downgradient of the Site are summarized in the following table (third quarter 2006 data).

Chemical	Well	Concentration ($\mu\text{g}/\text{l}$)	MCL* ($\mu\text{g}/\text{l}$)
PCE	MW-7	340	5
TCE	MW-11B	15,000	5
Cis-1,2-DCE	MW-14A	2,400	6
Trans-1,2-DCE	MW-13A	17	10
1,1-DCE	MW-11B	1,100	6
Vinyl Chloride	MW-16A	180	0.5
1,1,1-TCA	MW-13B	2.5	62
1,1,2-TCA	MW-13B	6.1	5
Benzene	MW-25A	0.15 J	1

d. Indoor and Ambient (Outdoor) Air

As part of the RI and risk assessment activities, indoor and ambient (outdoor) air samples were collected from locations at the Site during December 2003. Onsite indoor air sampling reported concentrations up to 4.9 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) TCE and 1.4 $\mu\text{g}/\text{m}^3$ cis-1,2-DCE. The commercial/industrial indoor air ESL was exceeded only for TCE on-Site.

Indoor, crawl space, and ambient air samples were also collected from designated homes in the Colony Park neighborhood during January-September 2004 and August 2005-January 2006. Samples for TCE analysis were collected from 47 private residences. Indoor air at nine of the residences contained concentrations of TCE in indoor air that exceed the residential ESL ($1.2 \mu\text{g}/\text{m}^3$). These residences are generally located within the surface “footprint” of the core of the A-Zone groundwater plume. PCE, which is not a chemical of concern that originates from the Hookston Station Site, was detected at concentrations exceeding the indoor air ESL of $0.41 \mu\text{g}/\text{m}^3$ in 15 residences. These residences are located throughout the Colony Park neighborhood. Benzene was detected above the ESL of $0.085 \mu\text{g}/\text{m}^3$ in the indoor air of all of the 42 residences sampled during August 2005-January 2006. Benzene is a constituent of gasoline that is commonly detected in urban/suburban air and is not a chemical of concern associated with the Hookston Station Site.

e. Surface Water and Sediments

Water quality samples collected from the Walnut Creek channel indicated the presence of low concentrations of PCE, TCE, and cis-1,2-DCE, in the surface water samples. All these concentrations were below the applicable National Ambient Water Quality Criteria and the California Inland Surface Waters Criteria for protection of aquatic organisms and human health via ingestion of aquatic organisms. Sediment samples were collected along the unlined portion of the Walnut Creek channel, and no VOCs were detected in any of these samples.

8. **Interim Remedial Measures:** The Responsible Parties have taken interim remedial actions to prevent exposure to VOCs in groundwater and indoor air. Based on the results of the 2004 indoor air sampling event, the Responsible Parties offered to install vapor intrusion prevention systems in all homes that contained TCE concentrations that were greater than the residential ESL of 1.2 micrograms per cubic meter (μ/m^3). Results from the August 2005-January 2006 sampling event show that the homes where the vapor intrusion prevention systems were installed, which previously exceeded the ESL for TCE,

now contain TCE concentrations below the ESL. The Responsible Parties offered to install vapor intrusion prevention systems in additional homes following the August 2005-January 2006 sampling event. As of June 2006, vapor intrusion prevention systems have been installed in seven residences, and a monitoring program has been implemented for those homes.

The Responsible Parties conducted private well surveys for nearly 600 homes located in the vicinity of the Site during 2003. The surveys identified twelve private backyard wells located in the Colony Park neighborhood and within the surface “footprint” of the A-Zone and B-Zone groundwater plumes. To eliminate potential exposure to impacted groundwater and potential cross-contamination of the water-bearing zones, the Responsible Parties offered to properly close (i.e., abandon) these twelve wells. The well closures involve removing well pumps and electrical systems, followed by pressurized grouting to seal the well from further use. As of the end of August 2006, eight wells have been abandoned and are no longer used. The owners of the four remaining wells indicated that they do not use the wells, or the wells are used for irrigation purposes only.

The Interim Remedial Measures implemented by the Responsible Parties have served to eliminate off-Site exposures to TCE at concentrations above conservative theoretical risk-based screening levels (see Finding 9); however these measures must remain in place (including installation of additional vapor intrusion prevention systems and decommissioning of private wells, where needed) until the appropriate cleanup goals for groundwater and soil vapor are achieved.

- 9. Environmental Risk Assessment:** The Baseline Risk Assessment (CTEH; February 24, 2006) quantifies the theoretical lifetime risks to the community from the Hookston Station Site and other upgradient sources, and provides the framework to evaluate potential remedial actions. The report identifies the primary exposure pathways that drive the cleanup plan – vapor intrusion into indoor air and potential future use of groundwater. The report presents two estimates of exposure and theoretical risk that potentially result from inhalation of chemicals in residential indoor air. Board staff considers the higher inhalation rates used for the second exposure estimate to be upper-bound rates that conservatively estimate the maximum credible exposure by offsite child and adult residents.

The theoretical lifetime excess cancer risk estimates for onsite commercial/industrial worker inhalation of TCE in indoor air is 2.4×10^{-6} . Theoretical lifetime excess cancer risk associated with construction worker exposure to chemicals in onsite soil is 4.3×10^{-5} , due largely to elevated arsenic concentrations in two of 19 surface soil samples.

The theoretical lifetime excess cancer risk for off-site residents exposed to volatile organic compounds in indoor air risk is up to 8.0×10^{-5} , depending on the residential location sampled. Calculated “worst-case” theoretical lifetime excess cancer risks associated with groundwater use for irrigation and filling a swimming pool are 6.8×10^{-6} and 8.1×10^{-6} ,

respectively. The theoretical lifetime excess cancer risk resulting from inhalation of VOCs volatilizing from surface water (Walnut Creek) is calculated to be 1.6×10^{-6} , due primarily to PCE, a chemical that does not originate from the Site. The cumulative “worst-case” theoretical excess lifetime cancer risk for offsite residents exposed to VOCs in indoor air, groundwater, and surface water range is 9.65×10^{-5} .

For comparison, the Board considers the following risks to be acceptable at remediation sites: a cumulative hazard index of 1.0 or less for non-carcinogens and, for carcinogens, a cumulative excess cancer risk of 1×10^{-6} or less (residential scenario) or 1×10^{-5} or less (commercial/industrial scenario).

Findings 8 and 11 describe management of excess risk.

10. Feasibility Study: The Feasibility Study (ERM; July 10, 2006) was developed to evaluate potential remedial alternatives and develop a cleanup plan. The following Remedial Action Objectives were developed for the Hookston Station Parcel and downgradient impacted area:

1. Protect human health from potentially impacted indoor air by reducing concentrations of chemicals that originate from the Hookston Station Parcel in indoor air to levels of one-in-a-million theoretical lifetime excess cancer risk for carcinogens, or a hazard index of 1 for non-carcinogenic risks.
2. Protect human health from possible future consumption or contact with ground water containing chemicals above risk-based cleanup goals that originate from the Hookston Station Parcel by preventing future extraction of VOC-impacted ground water for beneficial uses (e.g., domestic, municipal, or industrial water supply) until the final ground water cleanup goals are achieved.
3. Protect human health from incidental ingestion, dermal contact, and inhalation of particles from subsurface soil (deeper than 0.5 feet bgs) at a limited area on the Hookston Station Parcel.
4. Achieve restoration of ground water impacted by chemicals that originate from the Hookston Station Parcel for existing and potential beneficial uses.

The RPs considered many cleanup options, which were compared and contrasted against one another in the FS. Cleanup alternatives discussed in the FS include (1) no action; (2) monitored natural attenuation; (3) enhanced bioremediation in the A-Zone and in-situ chemical oxidation in the B-Zone; (4) permeable reactive barrier (PRB) in the A-Zone and in-situ chemical oxidation in the B-Zone; (5) PRB in the A- and B-Zones; and (6) pump and treat in the A- and B-Zones. Alternatives 2 through 6 also include exposure prevention activities, which include vapor intrusion prevention systems, removal of private irrigation wells, institutional controls to restrict future development of water supplies in the impacted area, and a soil management plan for a small area of on-site soils impacted by arsenic.

The FS evaluated the alternatives using criteria established by USEPA:

- Overall protection of human health and the environment
- Compliance with Applicable or Relevant and Appropriate Requirements
- Long-term effectiveness
- Reduction of toxicity, mobility, or volume through treatment
- Short-term effectiveness
- Implementability
- Cost
- Community Acceptance
- Regulatory Acceptance

11. **Remedial Action Plan:** The detailed and comparative analysis presented in the FS provides a basis for determining which remedial alternative is most appropriate for protecting human health and the environment and managing long-term risk. The preferred cleanup alternative (Remedial Alternative 4) includes the following components:

- Zero-valent iron PRB for A-Zone ground water;
- Chemical oxidation for B-Zone ground water;
- Institutional controls for a single location of arsenic-impacted subsurface soil on the Hookston Station Parcel in the form of a soil management plan;
- Vapor intrusion prevention systems;
- Removal of private wells from residences that overlie the A-Zone and B-Zone groundwater plumes;
- Institutional controls to restrict future development of water supplies within the impacted area until final ground water cleanup goals are achieved.

The Remedial Action Plan does not propose active remediation for VOCs in soil, because ESLs were exceeded for only TCE and cis-1,2, DCE, and the five locations where the ESLs were exceeded are all beneath one of the commercial buildings at the Site. The potential for soil leaching at these locations is reduced significantly because the existing structure prevents rainfall from percolating into the subsurface. Should site conditions change and the buildings be removed, soil cleanup standards will apply and soil cleanup may be needed.

Due to excess risk that will be present at the Site pending full remediation (see Finding 9), institutional constraints are appropriate to limit on-Site exposure to acceptable levels. Institutional constraints include a deed restriction that notifies future Site owners of subsurface contamination, prohibits the use of shallow groundwater beneath the Site as a source of drinking water until cleanup standards are met, and prohibits sensitive uses of the Site such as residences and daycare centers.

12. **Basis for Cleanup Standards**

- a. **General:** State Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California," applies to this discharge and requires attainment of background levels of water quality, or the highest level of water quality which is reasonable if background levels of water quality cannot be restored. Cleanup levels other than background must be consistent with the maximum benefit to the people of the State, not unreasonably affect present and anticipated beneficial uses of such water, and not result in exceedance of applicable water quality objectives. This order and its requirements are consistent with Resolution No. 68-16.

State Board Resolution No. 92-49, "Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304," applies to this discharge. This order and its requirements are consistent with the provisions of Resolution No. 92-49, as amended.

- b. **Beneficial Uses:** The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on June 21, 1995. This updated and consolidated plan represents the Board's master water quality control planning document. The revised Basin Plan was approved by the State Water Resources Control Board and the Office of Administrative Law on July 20, 1995, and November 13, 1995, respectively. A summary of regulatory provisions is contained in Title 23, California Code of Regulations, Section 3912. The Basin Plan defines beneficial uses and water quality objectives for waters of the State, including surface waters and groundwaters.

Board Resolution No. 89-39, "Sources of Drinking Water," defines potential sources of drinking water to include all groundwater in the region, with limited exceptions for areas of high TDS, low yield, or naturally-high contaminant levels. Groundwater underlying and adjacent to the site qualifies as a potential source of drinking water.

The Basin Plan designates the following potential beneficial uses of groundwater underlying and adjacent to the site:

- Municipal and domestic water supply
- Industrial process water supply
- Industrial service water supply
- Agricultural water supply

At present, there is no known use of groundwater underlying the site and in the downgradient area for the above purposes, except for several private wells on residential properties. These wells are reported to be limited to use only for

irrigation and filling swimming pools. All residences and businesses are served by the Contra Costa County Water District.

The existing and potential beneficial uses of the Walnut Creek include:

- Water contact and non-contact recreation
- Wildlife habitat
- Cold freshwater and warm freshwater habitat
- Fish migration and spawning

- c. **Basis for Groundwater Cleanup Standards:** The groundwater cleanup standards for the Site are shown in Section B.2 below. The standards are based on applicable water quality objectives and are the more stringent of EPA and California primary maximum contaminant levels (MCLs). Cleanup to this level will protect beneficial use of groundwater and will result in acceptable residual risk to humans.
- d. **Basis for Soil Cleanup Standards:** The soil cleanup standards for the Site are shown in section B.3 below. Cleanup to this level is intended to prevent leaching of contaminants to groundwater and will result in acceptable residual risk to humans, should site conditions change.
13. **Future Changes to Cleanup Standards:** The goal of this remedial action is to restore the beneficial uses of groundwater underlying and adjacent to the site. Results from other sites suggest that full restoration of beneficial uses to groundwater as a result of active remediation at this site may not be possible. If full restoration of beneficial uses is not technologically or economically achievable within a reasonable period of time, then the Responsible Parties may request modification to the cleanup standards or establishment of a containment zone, a limited groundwater pollution zone where water quality objectives are exceeded. Conversely, if new technical information indicates that cleanup standards can be surpassed, the Board may decide that further cleanup actions should be taken.
14. **Reuse or Disposal of Extracted Groundwater:** Board Resolution No. 88-160 allows discharges of extracted, treated groundwater from site cleanups to surface waters only if it has been demonstrated that neither reclamation nor discharge to the sanitary sewer is technically and economically feasible.
15. **Basis for 13304 Order:** California Water Code Section 13304 authorizes the Board to issue orders requiring a Responsible Party to cleanup and abate waste where the Responsible Party has caused or permitted waste to be discharged or deposited where it is or probably will be discharged into waters of the State and creates or threatens to create a condition of pollution or nuisance.

16. **Cost Recovery:** Pursuant to California Water Code Section 13304, the Responsible Parties are hereby notified that the Board is entitled to, and may seek reimbursement for, all reasonable costs actually incurred by the Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required by this order.
17. **CEQA:** This action is an order to enforce the laws and regulations administered by the Board. As such, this action is categorically exempt from the provisions of the California Environmental Quality Act (CEQA) pursuant to Section 15321 of the Resources Agency Guidelines.
18. **Notification:** The Board has notified the Responsible Parties and all interested agencies and persons of its intent under California Water Code Section 13304 to prescribe site cleanup requirements for the discharge, and has provided them with an opportunity to submit their written comments.
19. **Public Hearing:** The Board, at a public meeting, heard and considered all comments pertaining to this discharge.

IT IS HEREBY ORDERED, pursuant to Section 13304 of the California Water Code, that the Responsible Parties (or their agents, successors, or assigns) shall cleanup and abate the effects described in the above findings as follows:

A. PROHIBITIONS

1. The discharge of wastes or hazardous substances in a manner which will degrade water quality or adversely affect beneficial uses of waters of the State is prohibited.
2. Further significant migration of wastes or hazardous substances through subsurface transport to waters of the State is prohibited.
3. Activities associated with the subsurface investigation and cleanup which will cause significant adverse migration of wastes or hazardous substances are prohibited.

B. REMEDIAL ACTION PLAN AND CLEANUP STANDARDS

1. **Implement Remedial Action Plan:** The Responsible Parties shall implement the remedial action plan described in Finding 11.

2. **Groundwater Cleanup Standards:** The following groundwater cleanup standards shall be met in all wells identified in the Self-Monitoring Program, unless demonstrated ambient levels are higher:

Constituent	Standard (ug/l)	Basis
TCE	5	MCL
Cis-1,2-DCE	6	MCL
Trans-1,2-DCE	10	MCL
1,1-DCE	6	MCL
Vinyl chloride	0.5	MCL

The following **indoor air vapor intrusion cleanup standards** shall be met for groundwater in all wells located downgradient of the PRB that are identified in the Self-Monitoring Program in order to provide a basis for removing vapor intrusion prevention systems:

Constituent	Standard (µg/l)	Basis
TCE	530	ESL; vapor intrusion
Cis-1,2-DCE	6,200	ESL; vapor intrusion
Trans-1,2-DCE	6,700	ESL; vapor intrusion
1,1-DCE	6,300	ESL; vapor intrusion
Vinyl chloride	3.8	ESL; vapor intrusion

3. **Soil Cleanup Standards:** The following soil cleanup standards shall be met in all on-site vadose-zone soils.

Constituent	Standard (mg/kg)	Basis
Arsenic ¹	31	Risk-based
TCE ²	0.46	ESL; leaching to groundwater
Cis-1,2-DCE ²	0.19	ESL; leaching to groundwater
Trans-1,2-DCE ²	0.67	ESL; leaching to groundwater

1,1-DCE ²	1.0	ESL; leaching to groundwater
Vinyl chloride ²	0.019	ESL; leaching to groundwater

¹Arsenic impacts to shallow soil are being addressed through a Soil Management Plan. No active cleanup is proposed.

²Existing site conditions significantly reduce the potential for leaching of VOCs in soil to groundwater. Should site conditions change and the buildings be removed, soil cleanup standards will apply (see Finding 11).

5. **Soil Vapor Cleanup Standards:** The following soil vapor cleanup standards shall be met in all offsite soil vapor monitoring probes:

Constituent	Standard ($\mu\text{g}/\text{m}^3$)	Basis
TCE	1200	ESL; vapor intrusion
Cis-1,2-DCE	7300	ESL; vapor intrusion
Trans-1,2-DCE	15,000	ESL; vapor intrusion
1,1-DCE	42,000	ESL; vapor intrusion
Vinyl chloride	32	ESL; vapor intrusion

C. TASKS

1. EXPANSION OF SOIL VAPOR MONITORING NETWORK

a. WORKPLAN

COMPLIANCE DATE: *February 15, 2007*

Submit a workplan and time schedule, acceptable to the Executive Officer, for soil vapor monitoring outside the core groundwater TCE plume area and northwest of the core plume area. This is to supplement the existing network within the core plume area and southeast of the core plume area.

b. SOIL VAPOR MONITORING NETWORK EXPANSION REPORT

COMPLIANCE DATE: *April 30, 2007*

Submit a technical report acceptable to the Executive Officer documenting completion of necessary tasks identified in the Task 1a workplan. The technical

report should define the lateral extent of soil vapor pollution down to concentrations at or below the cleanup standards for soil vapor.

2. **CHEMICAL OXIDATION PILOT STUDY WORKPLAN**

COMPLIANCE DATE: *February 28, 2007*

Submit a workplan and time schedule acceptable to the Executive Officer, for completing an in situ chemical oxidation pilot study at the Site to support the Remedial Design and Implementation Plan (see Task 4, below). The workplan shall include a description of the proposed chemical injection program, a health and safety plan, and a pre- and post-injection water quality monitoring plan.

3. **REMEDIAL DESIGN AND IMPLEMENTATION PLAN – PERMEABLE REACTIVE BARRIER**

COMPLIANCE DATE: *June 29, 2007*

Submit 90% design plans for construction of the permeable reactive barrier to the Executive Officer. Final (100%) design plans may be submitted after contractor selection. The plans shall be consistent with the approved FS. The design plans shall be based on pre-design investigations. A summary of changes to the concept presented in the FS, if any, shall accompany the design plans. The implementation plan shall describe all significant implementation steps and shall include a health and safety plan and an implementation schedule.

4. **REMEDIAL DESIGN AND IMPLEMENTATION PLAN – CHEMICAL OXIDATION**

COMPLIANCE DATE: *August 31, 2007*

Submit 90% design plans for the chemical oxidation program to the Executive Officer. Final (100%) design plans may be submitted after contractor selection. The plans shall be consistent with the approved FS. The design plans shall be based on pre-design investigations and the results of the field pilot study in Task 2. A summary of changes to the concept presented in the FS, if any, shall accompany the design plans. The implementation plan shall describe all significant implementation steps and shall include a health and safety plan and an implementation schedule.

5. **IMPLEMENTATION OF CHEMICAL OXIDATION SYSTEM**

COMPLIANCE DATE: *May 15, 2008*

Submit a technical report acceptable to the Executive Officer documenting completion of necessary tasks identified for chemical oxidation in Task 4. For ongoing actions, such as chemical oxidation of VOCs in groundwater, the report should document system start-up (as opposed to completion) and should present initial results on system effectiveness (e.g. capture zone or area of influence). Proposals for further system expansion or modification may be included in annual reports (see Self-Monitoring Program).

6. **IMPLEMENTATION OF PERMEABLE REACTIVE BARRIER**

COMPLIANCE DATE: *September 28, 2008*

Submit a technical report acceptable to the Executive Officer documenting completion of necessary tasks identified for installation of the Permeable Reactive Barrier in Task 3. The report should present initial data for performance monitoring. Proposals for further system expansion or modification may be included in annual reports (see Self-Monitoring Program).

7. **PROPOSED INSTITUTIONAL CONSTRAINTS**

COMPLIANCE DATE: *March 31, 2007*

Submit a technical report acceptable to the Executive Officer documenting procedures to be used by the Responsible Parties to prevent or minimize human exposure to soil and groundwater contamination prior to meeting cleanup standards. Such procedures shall include the following:

- a. Soil Management Plan for Arsenic in Soil (on-Site) to prevent exposure by construction workers to elevated concentrations of arsenic during subsurface construction activities.
- b. Deed restriction that notifies future Site owners of sub-surface contamination, prohibits the use of shallow groundwater beneath the Site as a source of drinking water until cleanup standards are met, and prohibits sensitive uses of the Site such as residences and daycare centers.
- c. Vapor Intrusion Prevention Systems to prevent exposure to elevated concentrations of VOCs in residential indoor air in homes above the off-Site downgradient groundwater plume area.
- d. Private Well Removal to reduce the potential risks posed by use of VOC-impacted groundwater for landscape/garden irrigation and filling swimming pools.
- e. New Well Restrictions to ensure that current and future landowners are not permitted to install water supply wells until the final groundwater cleanup goals are achieved.

8. **IMPLEMENTATION OF INSTITUTIONAL CONSTRAINTS**

COMPLIANCE DATE: *60 days after Executive Officer approval*

Submit a technical report acceptable to the Executive Officer documenting that the proposed institutional constraints described in Task 7 have been implemented. In the event a homeowner refuses access, the report shall document the Responsible Parties' attempt to gain access.

9. **STATUS REPORT ON REMEDY EFFECTIVENESS**

COMPLIANCE DATE: *December 31, 2009,
December 31, 2012,
and every 5 years afterward*

Submit a technical report acceptable to the Executive Officer evaluating the effectiveness of the approved remedial action plan. The report should include:

- a. Summary of effectiveness in controlling contaminant migration and protecting human health and the environment
- b. Comparison of contaminant concentration trends with cleanup standards
- c. Comparison of anticipated versus actual costs of cleanup activities
- d. Performance data (e.g. groundwater volume treated, chemical mass removed, mass removed per million gallons treated)
- e. Cost effectiveness data (e.g. cost per pound of contaminant removed)
- f. Summary of additional investigations (including results) and significant modifications to remediation systems
- g. Additional remedial actions proposed to meet cleanup standards (if applicable) including time schedule

If cleanup standards have not been met and are not projected to be met within a reasonable time, the report should assess the technical practicability of meeting cleanup standards and may propose an alternative cleanup strategy.

10. **ALTERNATIVE CLEANUP PLAN**

COMPLIANCE DATE: *90 days after requested
by Executive Officer*

If the Executive Officer concludes that the selected remedy is not working or needs major modification, and the Task 9 status report does not arrive at the same

conclusion, submit a technical report acceptable to the Executive Officer consisting of a workplan to implement an alternative cleanup strategy.

11. PROPOSED CURTAILMENT

COMPLIANCE DATE: *60 days prior to proposed curtailment*

Submit a technical report acceptable to the Executive Officer containing a proposal to curtail remediation. Curtailment includes system closure (e.g. well abandonment), system suspension (e.g. cease injection but wells retained), and significant system modification (e.g. major reduction in injection rates, closure of individual injection wells within injection network). The report should include the rationale for curtailment. Proposals for final closure should demonstrate that cleanup standards have been met, contaminant concentrations are stable, and contaminant migration potential is minimal.

12. IMPLEMENTATION OF CURTAILMENT

COMPLIANCE DATE: *60 days after Executive Officer approval*

Submit a technical report acceptable to the Executive Officer documenting completion of the tasks identified in Task 11.

13. EVALUATION OF NEW HEALTH CRITERIA

COMPLIANCE DATE: *90 days after requested
by Executive Officer*

Submit a technical report acceptable to the Executive Officer evaluating the effect on the approved remedial action plan of revising one or more cleanup standards in response to revision of drinking water standards, maximum contaminant levels, or other health-based criteria.

14. EVALUATION OF NEW TECHNICAL INFORMATION

COMPLIANCE DATE: *90 days after requested
by Executive Officer*

Submit a technical report acceptable to the Executive Officer evaluating new technical information which bears on the approved remedial action plan and cleanup standards for this site. In the case of a new cleanup technology, the report should evaluate the technology using the same criteria used in the feasibility study. Such technical reports shall not be requested unless the

Executive Officer determines that the new information is reasonably likely to warrant a revision in the approved remedial action plan or cleanup standards.

15. **Delayed Compliance:** If the Responsible Parties are delayed, interrupted, or prevented from meeting one or more of the completion dates specified for the above tasks, the Responsible Parties shall promptly notify the Executive Officer and the Board may consider revision to this Order.

D. PROVISIONS

1. **No Nuisance:** The storage, handling, treatment, or disposal of polluted soil or groundwater shall not create a nuisance as defined in California Water Code Section 13050(m).
2. **Good O&M:** The Responsible Parties shall maintain in good working order and operate as efficiently as possible any facility or control system installed to achieve compliance with the requirements of this Order.
3. **Cost Recovery:** The Responsible Parties shall be liable, pursuant to California Water Code Section 13304, to the Board for all reasonable costs actually incurred by the Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required by this Order. If the site addressed by this Order is enrolled in a State Board-managed reimbursement program, reimbursement shall be made pursuant to this Order and according to the procedures established in that program. Any disputes raised by the Responsible Parties over reimbursement amounts or methods used in that program shall be consistent with the dispute resolution procedures for that program.
4. **Access to Site and Records:** In accordance with California Water Code Section 13267(c), the Responsible Parties shall permit the Board or its authorized representative:
 - a. Entry upon premises in which any pollution source exists, or may potentially exist, or in which any required records are kept, which are relevant to this Order.
 - b. Access to copy any records required to be kept under the requirements of this Order.
 - c. Inspection of any monitoring or remediation facilities installed in response to this Order.

- d. Sampling of any groundwater or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the Responsible Parties.
5. **Self-Monitoring Program:** The Responsible Parties shall comply with the Self-Monitoring Program as attached to this Order and as may be amended by the Executive Officer.
6. **Contractor / Consultant Qualifications:** All technical documents shall be signed by and stamped with the seal of a California registered geologist, a California certified engineering geologist, or a California registered civil engineer.
7. **Lab Qualifications:** All samples shall be analyzed by State-certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control (QA/QC) records for Board review. This provision does not apply to analyses that can only reasonably be performed on-site (e.g. temperature).
8. **Document Distribution:** Copies of all correspondence, technical reports, and other documents pertaining to compliance with this Order shall be provided to the following agencies and individuals:
 - a. City of Pleasant Hill
 - b. City of Concord
 - c. Contra Costa County Health Services Department
 - i. Hazardous Materials Division
 - ii. Public Health Division
 - iii. Environmental Health Division
 - d. Colony Park Neighbors Association; c/o Lucy Goodell
 - e. Mount Diablo Unified School District
 - f. Contra Costa County Central Library; Attn: Carol Yuke

The Executive Officer may modify this distribution list as needed.

9. **Reporting of Changed Owner or Operator:** The Responsible Parties shall file a technical report on any changes in site occupancy or ownership associated with the property described in this Order.
10. **Reporting of Hazardous Substance Release:** If any hazardous substance is discharged in or on any waters of the State, or discharged or deposited where it is,

or probably will be, discharged in or on any waters of the State, the Responsible Parties shall report such discharge to the Board by calling (510) 622-2369 during regular office hours (Monday through Friday, 8:00 to 5:00).

A written report shall be filed with the Board within five working days. The report shall describe the nature of the hazardous substance, estimated quantity involved, duration of incident, cause of release, estimated size of affected area, nature of effect, corrective actions taken or planned, schedule of corrective actions planned, and persons/agencies notified.

This reporting is in addition to reporting to the Office of Emergency Services required pursuant to the Health and Safety Code.

- 11. **Rescission of Existing Order:** This Order supercedes and rescinds Orders No. R2-2003-0035 and R2-2004-0081.
- 12. **Periodic SCR Review:** The Board will review this Order periodically and may revise it when necessary.

I, Bruce H. Wolfe, Executive Officer, 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 _____.

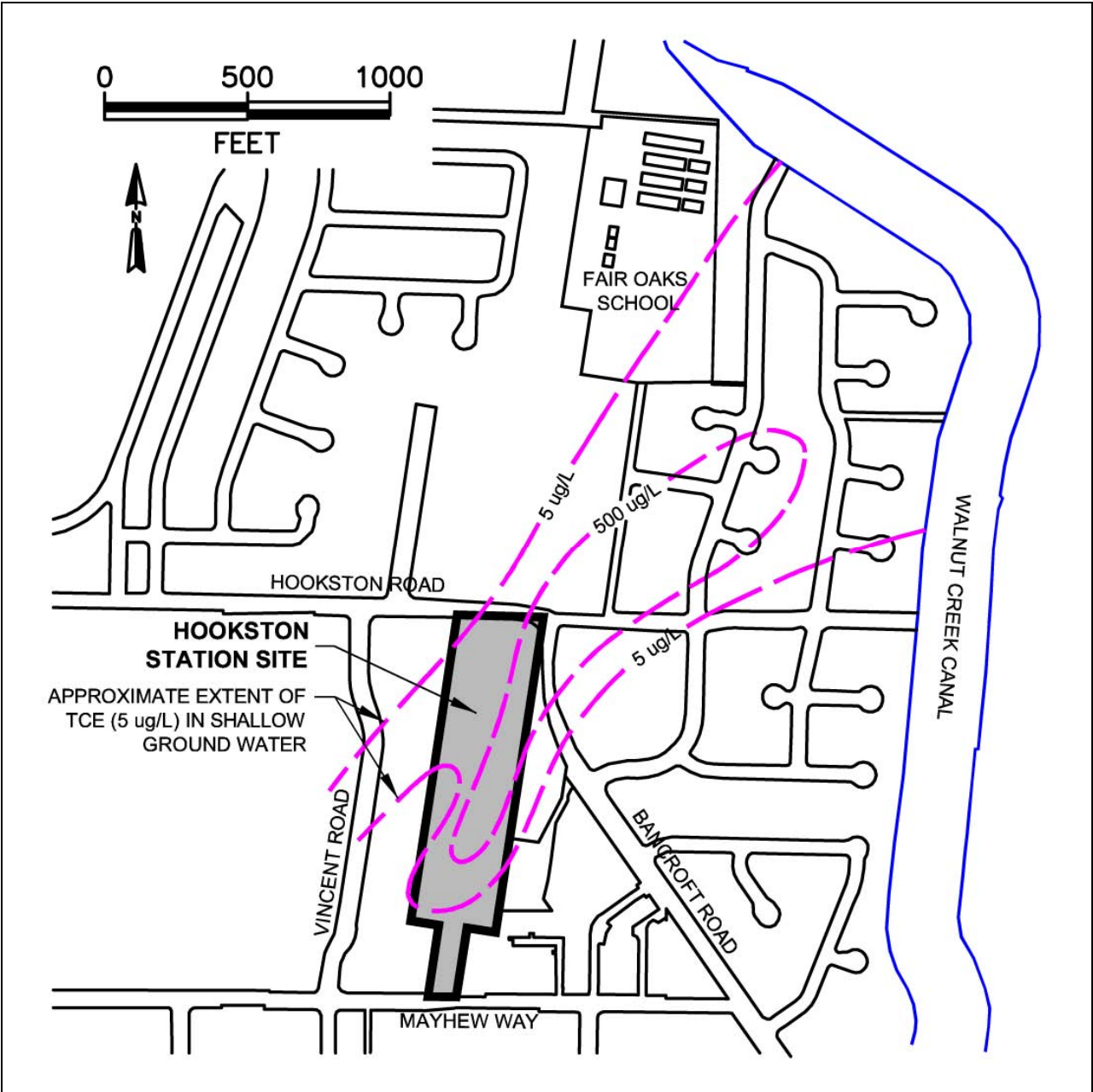
Bruce H. Wolfe
Executive Officer

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FAILURE TO COMPLY WITH THE REQUIREMENTS OF THIS ORDER MAY SUBJECT YOU TO ENFORCEMENT ACTION, INCLUDING BUT NOT LIMITED TO: IMPOSITION OF ADMINISTRATIVE CIVIL LIABILITY UNDER WATER CODE SECTIONS 13268 OR 13350, OR REFERRAL TO THE ATTORNEY GENERAL FOR INJUNCTIVE RELIEF OR CIVIL OR CRIMINAL LIABILITY

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Attachments: Site Location Map
Self-Monitoring Program



Site Location Map, showing extent of shallow groundwater plume. Based on groundwater monitoring data from 4th quarter 2005.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM FOR:

UNION PACIFIC RAILROAD COMPANY
DANIEL C. and MARY LOU HELIX, ELIZABETH YOUNG, JOHN V. HOOK, NANCY
ELLI COCK, STEVEN PUCELL,
AND CONTRA COSTA COUNTY REDEVELOPMENT AGENCY

for the property referred to as:

HOOKSTON STATION

and located at
228 HOOKSTON ROAD
PLEASANT HILL, CONTRA COSTA COUNTY

1. **Authority and Purpose:** The Board requires the technical reports required in this Self-Monitoring Program pursuant to Water Code Sections 13267 and 13304. This Self-Monitoring Program is intended to document compliance with Board Order No. R2-2007-XXXX (site cleanup requirements).
2. **Groundwater Monitoring:** The Responsible Parties shall measure groundwater elevations semi-annually in all monitoring wells, and shall collect and analyze representative samples of groundwater according to the following table:

Well No.	Sampling Frequency	Remarks
MW-01	Semi-Annual	"A-Zone"
MW-03	Semi-Annual	"A-Zone"
MW-04	Semi-Annual	"A-Zone"
MW-05	Semi-Annual	"A-Zone"
MW-06	Annual	"A-Zone"
MW-07	Semi-Annual	"A-Zone"
MW-08A	Semi-Annual	"A-Zone"
MW-11A	Semi-Annual	"A-Zone"
MW-12A	Semi-Annual	"A-Zone"
MW-13A	Semi-Annual	"A-Zone"
MW-14A	Semi-Annual	"A-Zone"
MW-15A	Semi-Annual	"A-Zone"
MW-16A	Semi-Annual	"A-Zone"

MW-17A	Semi-Annual	“A-Zone”
MW-18A	Annual	“A-Zone”
MW-19A	Annual	“A-Zone”
MW-23A	Semi-Annual	“A-Zone”
MW-24A	Semi-Annual	“A-Zone”
MW-25A	Semi-Annual	“A-Zone”
MW-01D/ MW-08B	Semi-Annual	“B-Zone”
MW-02D/ MW-09B	Annual	“B-Zone”
MW-03D/ MW-10B	Semi-Annual	“B-Zone”
MW-11B	Semi-Annual	“B-Zone”
MW-12B	Semi-Annual	“B-Zone”
MW-13B	Semi-Annual	“B-Zone”
MW-14B	Semi-Annual	“B-Zone”
MW-15B	Semi-Annual	“B-Zone”
MW-16B	Semi-Annual	“B-Zone”
MW-17B	Semi-Annual	“B-Zone”
MW-18B	Semi-Annual	“B-Zone”
MW-19B	Semi-Annual	“B-Zone”
MW-23B	Semi-Annual	“B-Zone”
MW-24B	Semi-Annual	“B-Zone”
MW-25B	Semi-Annual	“B-Zone”
MW-26B	Annual	“B-Zone”
MW-15C	Annual	“C-Zone”
MW-19C	Annual	“C-Zone”
MW-23C	Annual	“C-Zone”

Groundwater samples shall be collected during the rainy and dry seasons (approximately first and third quarters) each year. All samples shall be analyzed using EPA Method 8260B or equivalent.

The Responsible Parties shall sample any new monitoring or extraction wells quarterly for at least four quarters and analyze groundwater 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. Additionally, the monitoring program described above may be modified for performance monitoring purposes when remedial actions are implemented.

3. **Soil vapor monitoring:** Permanent soil vapor probes shall be monitored periodically as described in the following table to document trends in vapor concentrations near residences for the express purpose of evaluating the soil vapor intrusion pathway for chemicals originating from the Hookston Station Site. The soil vapor sampling activities

shall be implemented in accordance with the *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air – Interim Final* (DTSC, February 2005). Reporting limits shall be equal to or less than Environmental Screening Levels for shallow soil gas in a residential land use setting.

Probe No.	Sampling Frequency	Remarks
SVP-1	Quarterly	Vadose Zone
SVP-2	Quarterly	Vadose Zone
SVP-3	Quarterly	Vadose Zone
SVP-4	Quarterly	Vadose Zone
SVP-5	Quarterly	Vadose Zone
SVP-6	Quarterly	Vadose Zone
SVP-7	Annual	Vadose Zone, utility corridor
SVP-8	Annual	Vadose Zone, utility corridor
SVP-9	Annual	Vadose Zone, utility corridor
SVP-10	Annual	Vadose Zone, utility corridor
Additional locations		See Finding 7 and Task 2

All samples shall be analyzed using EPA method TO-15 or equivalent

The Responsible Parties shall sample any new monitoring probes quarterly and analyze 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.

4. **Indoor air monitoring:** Indoor air sampling and analysis shall be completed in accordance with the *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air* (DTSC, February 2005). The sampling program shall include the following:
- Samples shall be analyzed using 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;
 - Samples shall be collected from the first floors of all homes and from the second floors of two-story homes;
 - 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 and homes for which two sampling events have already included crawl-spaces.
 - Samples shall be collected over a 24-hour period using calibrated flow controllers;

- Outdoor air temperature 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.

Indoor air sampling and analysis shall be completed annually for all single family residences indicated on **Figure 1** for which access is 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, and no later than August 31. The Responsible Parties shall assist Water Board staff to send letters requesting access. The Responsible Parties shall meet with Water Board staff annually to discuss potential adjustments to the sampling area boundaries and sampling frequencies based upon the data collected during the previous year.

5. **Vapor Intrusion Prevention System Monitoring:** All houses with installed vapor intrusion prevention systems shall be visually inspected (and repaired, if needed) annually to ensure that the mechanical equipment is in good condition and operating properly and that the crawl space vapor barrier remains intact.
6. **Quarterly Monitoring Reports:** The Responsible Parties shall submit quarterly monitoring reports to the Board no later than 30 days following the end of the quarter (e.g. report for first quarter of the year due April 30). The first quarterly monitoring report shall be due on *April 30, 2007*.

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 the first and third quarter reports for the year. 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 the fourth quarterly report each year.

- c. Groundwater Analyses: Groundwater sampling data shall be presented in the first and third quarter reports for the year. Data shall be presented in tabular form, and an iso-concentration map should be prepared for one or more key contaminants for the A-Zone and B-Zone. 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 the fourth quarterly report each year. 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 quarterly report; results for vapor probes sampled on an annual basis shall be included in the report for the fourth quarter each year. 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 fourth quarterly report each year. 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).
- e. Groundwater Extraction: If applicable, the report shall include groundwater extraction results in tabular form, for each extraction well and for the site as a whole, expressed in gallons per minute and total groundwater volume for the quarter. The report shall also include contaminant removal results, from groundwater extraction wells and from other remediation systems (e.g. soil vapor extraction), expressed in units of chemical mass per day and mass for the quarter. Historical mass removal results shall be included in the fourth quarterly report each year.
- f. 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).

- g. 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.
- h. Status Report: The quarterly report shall describe relevant work completed during the reporting period (e.g. site investigation, interim remedial measures, institutional controls implementation) and work planned for the following quarter.

7. **GeoTracker Reporting**: Pursuant to Title 23, Division 3, Chapter 30, Articles 1 and 2, Sections 3890-3895 of the California Code of Regulations, the following information shall be submitted electronically to the State 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;
- h. PDF copies of all reports, workplans, and other documents, including the signed transmittal letter and professional certification by a California Licensed Civil Engineer or a Registered Geologist.

Additionally, hard copies of all documents and data submittals (except for NPDES general permit reports, which may be submitted exclusively as electronic documents) shall be submitted to the Water Board.

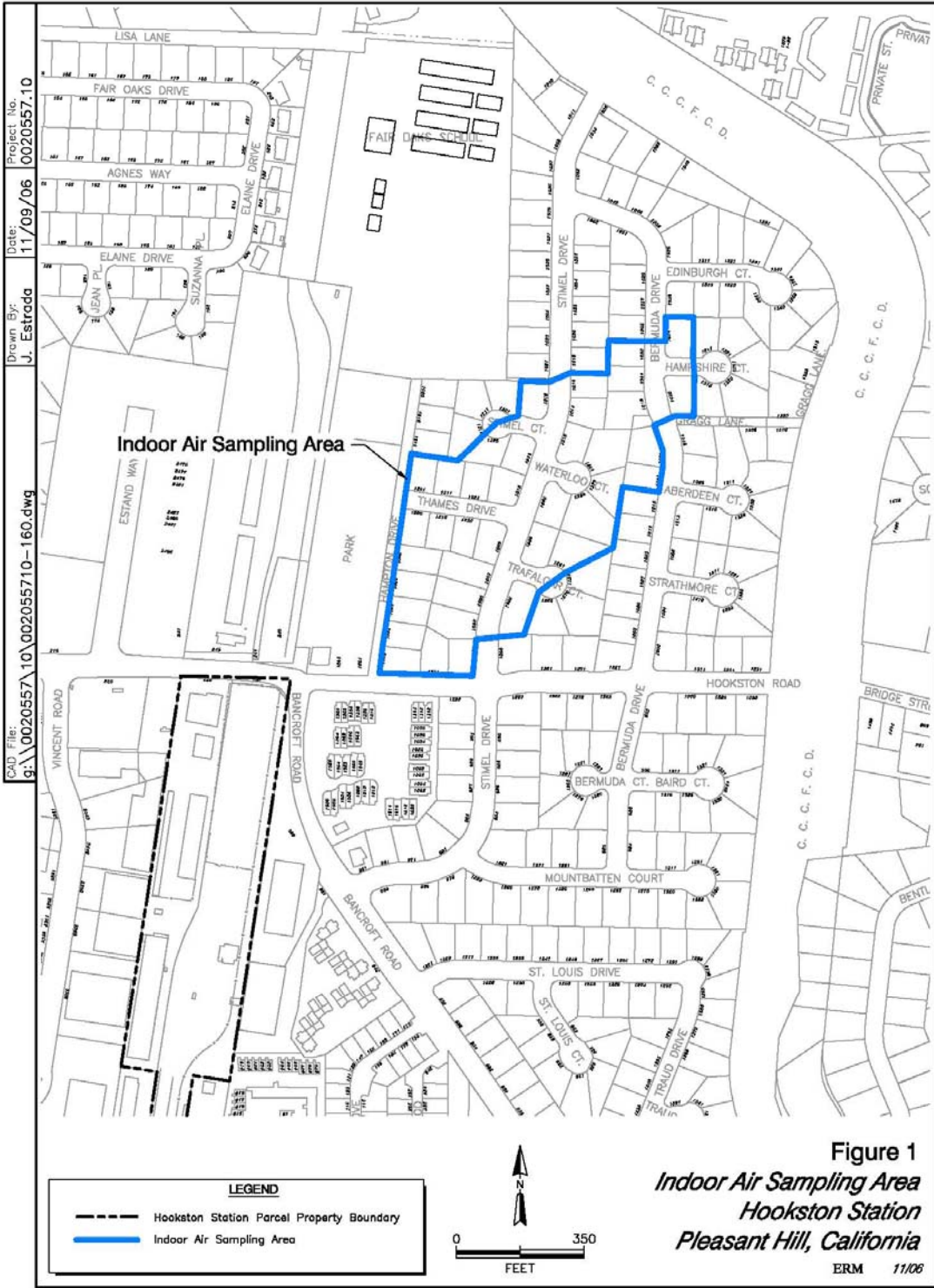
- 8. **Violation Reports**: If the Responsible Parties violate requirements in the Site Cleanup Requirements, then the s shall notify the Board office by telephone as soon as practicable once the Responsible Parties have knowledge of the violation. Board staff may, depending on violation severity, require the Responsible Parties to submit a separate technical report on the violation within five working days of telephone notification.
- 9. **Other Reports**: The Responsible Parties shall notify the 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.

10. **Record Keeping:** The Responsible Parties or their agent(s) 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 Board upon request.
11. **SMP 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. Prior to making SMP revisions, the Executive Officer will consider the burden, including costs, of associated self-monitoring reports relative to the benefits to be obtained from these reports.

I, Bruce H. Wolfe, Executive Officer, hereby certify that this Self-Monitoring Program was adopted by the Board on _____.

Bruce H. Wolfe
Executive Officer



Appendix B – Correspondence

12/29/2006

From: Janet L. Wolff, Trustee, Welch Family Trust

Response to SFBRWQCB for proposed remediation of toxic contamination for Hookston Station site

This response is provided to describe concerns with the currently proposed plan. It is requested that the SF-RWQCB provide adequate response to each point listed below prior to implementation of any remediation plan so that such actions can be fully supported as adequate for affected parties.

I. Permeable Reactive Barrier [PRB]

A. Questions that are not yet answered:

1) What is the range of length of the proposed PRB?

It is understood that it's length can be extended, if necessary, at a later date. If so, what would be the specific criteria and methodology used to insure this occurred if needed?

2) What is the PRB's top fill's range of width? And what is it comprised of? Does it have a earth-like natural surface or an asphalt concrete surface?

3) What will the Health and Safety Plan addressing worker and resident health and safety cover? Is there criteria defined that will be included in this plan that will be utilized as clear guidelines for each step of the remediation process, and continuation of any remedial actions? Will it address the post-installation phase of the PRB?

In the November 2, 2006 SF-Bay Area RWCQB Response to Comments on Feasibility Study for Hookston Station Site, Pleasant Hill, Contra Costa County (July 10, 2006), the response to Comment #4 stated that there will be a Health and Safety Plan addressing worker and resident health and safety, specifically with regard to risk from soil excavated during trenching.

4) What type of sealant will be used for the PRB to prevent surface exposure, both short term and long-term?

Note: The private backyard wells in the Colony Park neighborhood were sealed with pressurized grouting. In regards to resident health and safety, the sealant used for the PRB is also of major concern.

5) Why has the current layout (location and length) of the PRB been selected?

The current plan appears to produce many different results:

- The planned ending of the northwest location for the PRB does not allow for any later extensions.

Figure 6-10 of the Feasibility Study shows the left-side of the PRB will cut across Len Hester Park to the northwest at a 45 degree angle and ending at the cyclone metal fence bordering the iron horse trail (hence, no room to extend)

- The current proposed location of the PRB does not handle the toxic concentration range from 5 to 499 (parts per billion) present in this concentration range that lies to the north. This is clearly evident when comparing this to the footprint of the A-Zone Ground Water TCE Contour (ERM's Feasibility Study Figure 6-10), The unprotected northern area contains very sensitive property, that of the Fair Oaks Elementary School.
- The current proposed location of the PRB also does not protect the residences in Colony Park neighborhood south of Hookston Road, including the Colony Park Townhouses closest to the source site. And any later extension to the PRB in keeping with the right side's current west-east orientation would also not allow for initial protection to the residents south of Hookston Road
- The permeable reactive barrier right side's current design (west-east), its close proximity to the residences: 1000 Hampton Drive, 1221 Hookston Road, 1001 Stimel Drive. Installation of the permeable reactive barrier requires a major trench excavation (backhoe trenching and/or clamshell trenching and/or continuous trenching methods). From a health and safety perspective and attractiveness perspective, would these residents be agreeable to/satisfied with this current design?
- Present design appears to be in such close proximity to large existing trees in the Len Hester Park, and the affect on these root systems has not been addressed.

Based on the above points, the current design is inadequate, and there are alternatives that could be selected that should be much more feasible, provide critical remedial effectiveness for all affected parties, and are much more esthetically appropriate for the residential area. From meetings with the Water Board and from the information given, the PRB was presented as a remedial treatment is foremost in preventing the high concentration of toxic contaminants from entering the down- gradient area(s) of lesser concentration. Keeping this in mind, the current design described in ERM's Feasibility Study is inadequate.

Upon consideration of the above and unless there exists the option to add more permeable reactive barrier(s) later with different design configuration(s), I believe a "more embrative" design that transects the entire width of the A-Zone Ground Water TCE Contour with a "north-south or more north-south" orientation would be a better design approach/strategy. Other landscape considerations that support this, besides the open space of Len Hester Park, are the existence of two buffer zones to the south of Hookston Road:

- 1) An ivy-covered buffer zone adjacent to the Colony Park Townhouses' parking lot on east-side of Bancroft Road.

2) A pie-shaped triangular buffer zone on west-side of Bancroft Road that is runs north to south along east-side of Hookston Station Parcel (source of TCE contamination) and stops south at the parking lot of 999 Bancroft Road property.

This takes on special significance when considering the location of the the Vincent Road and Mayhew Way PCE Plume's source site (my understanding to the west and **southwest** of the Hookston Station Parcel) and the northwest migration of its contaminants.

In earlier meetings with the Board the Pitcock Petroleum's Plume was described as being more north, migrating parallel (northwest) to the Hookston Station's TCE Plume. The Board's Response to Comments dated (please refer to Response to Comment# 38) that the "*permeable reactive barrier is not expected to be effective on petroleum hydrocarbons or MTBE*" from the Pitcock Petroleum Plume. Also, in this Response to Comment# 38 there was mentioned that the "*petroleum hydrocarbons enhance the degradation of PCE and TCE...such as 1,1-DCE and vinyl chloride.*" In the last meetings, the byproduct from this degradation process, has been described as a highly serious toxin. In the last meeting the Water Board mentioned also that vinyl chloride tends to form where there is no oxygen or the oxygen is displaced by petroleum. Having a permeable reactive barrier design with a "north-south or more north-south" orientation, transecting the entire footprint of the entire width of the A-Zone Ground Water TCE Contour would seem to help to stop the commingling of these two Plumes and thereby, helping to eliminate the creation of this serious 'nasty' toxin, vinyl chloride. Also, depending on the maximum width of the top fill layer of the permeable reactive barrier and subsurface utility considerations, etc., it could run parallel ("north-south") near the iron horse trail. This design configuration and location would allow easy-access for monitoring purposes.

The 'north-south' design configuration does not have the proposed "two-step approach" of filtering the core area only of the A-Zone Ground Water TCE Contour and later, through the slower process of natural attenuation, the treatment of the peripheral areas of the A-Zone Ground Water TCE Contour. And the "third-step..." of later, if necessary, installing a separate permeable reactive barrier(s). Instead, it would have the more favorable "one-step approach" of filtering the entire A-Zone Ground Water TCE Contour simultaneously. And later, if necessary, the "next step" of adding extension(s) to the existing permeable reactive barrier could be implemented.

Due to greater area coverage (ie. additions/extensions) there is the potential for the "sharing of costs" between the RPs of the three Plumes: Hookston Station TCE Plume, Pitcock Petroleum Plume and Vincent Road and Mayhew Way PCE Plume.

Chemical Oxidation

For the November 2, 2006 San Francisco Bay Regional Water Quality Control Board Response to Comments on Feasibility Study for Hookston Station Site, Pleasant Hill, Contra Costa County (July 10, 2006)

Comment #70 stated:

“The proposed Clean-up Plan provides for the injection of chemical oxidants into the ground and the health and safety effects of these chemicals, proximity to underground pipes, utilities, Kinder Morgan high-pressure pipeline, PG&E distribution center, etc., have not been addressed.”

Your Response: *“See response to Comment 6.”*

Upon review of response to Comment 6, it addresses only the subject of the proximity of the chemical oxidant injections vs. the underground utilities and the Board's actions/safeguards (Remedial Design) for this injection process in regards to the underground utilities. Does the response to Comment 6 apply also to the Kinder Morgan high-pressure pipeline?

Later, upon review of Comment 14 in regards to this subject:

“What is potassium permanganate and what are the risks?”

Your Response: *“Potassium permanganate (KMnO₄) is a strong oxidizing agent. As an oxidizing agent it has the ability to add oxygen, remove hydrogen or remove electrons from an element or compound. As a strong oxidizer, KMnO₄ should be kept separated from oxidizable substances. Dilute solutions of KMnO₄ and water are not dangerous. KMnO₄ forms dangerous products upon contact with concentrated acids.*

In addition to its use in environmental remediation, KMnO₄ has been used throughout the United States to treat drinking water supplies. KMnO₄ is recognized by its characteristic purple to pink color when made into a solution. In higher concentrations it is a dark purple color.”

Your response to Comment 14 is that *“dilute solutions of KMnO₄ and water are not dangerous.”*

Our Response to your above listed response:

- What are the Health effects of this oxidant, the short-term and long-term effects from chronic exposure? What quantity-concentration levels of KMnO₄ is planned to be injected into the ground (Hookston Station Parcel)? What are the byproducts created from the degradation process where KMnO₄ commingles with the contaminants in Colony Park neighborhood and adjacent areas? Are any of them potentially hazardous? Is potassium permanganate's contact with oxidizable substance and/or concentrated acids pertain solely to contact in ground water? Any health studies you recommend for review on this subject?

Upon research (Material Safety Data Sheet, from: Mallinckrodt Baker, Inc., 222 Red School Lane, Phillipsburg, NJ 08865) there was the topic, **Potential Health Effects:**

Inhalation:

Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath. High concentrations can cause pulmonary edema.

Chronic Exposure:

Prolonged skin contact may cause irritation, defatting, and dermatitis. Chronic manganese poisoning can result from excessive inhalation exposure to manganese dust and involves impairment of the central nervous system. Early symptoms include sluggishness, sleepiness and weakness in the legs. Advanced cases have shown symptoms of fixed facial expression, emotional disturbances, spastic gait, and falling.

Considering the current circumstances where the community naturally would be highly sensitive to any chemical injection in the local area, a complete "Health and Safety Fact Sheet" on the "chemical chosen" should be provided/available to the community for review prior to any major injection.

Vincent Road and Mayhew Way PCE Plume

From information presented in the last meeting, the soil vapor concerns in regards to PCE, permeable reactive barrier's proper design and other remedial treatments considered could also potentially treat PCE, the PCE Plume's northwest migration towards the Colony Park neighborhood ...for health and safety reasons of this neighborhood and the adjacent areas, the procedural mechanisms needed to start/continue the mitigation process for this Plume should not be delayed due to lack of an identifiable responsible party(s).

Selection of Remedial Alternative 4 (A-Zone PRB, B-Zone Chemical Oxidation, and Common Components) too Passive Remedial Treatment

Upon review of the flow charts on the Remedial Alternatives (Figure I-5, I-7, I-9, I-11, I-13, I-15, I-17, I-21, I-23, I-25, I-27) from ERM's Feasibility Study's List of Figures, it becomes apparent that the initial years (1 year to 7-10 years approximately) are critical time period in treating the bulk mass of the Hookston Station's TCE contaminant. It follows that this applies to other contaminants as well...This awareness, along with the stranded-braided geological nature of the A-Zone that is conducive to creating "hot toxic spots" shows the need for an initial aggressive remedial treatment approach.

For the November 2, 2006 San Francisco Bay Regional Water Quality Control Board Response to Comments on Feasibility Study for Hookston Station Site, Pleasant Hill, Contra Costa County (July 10, 2006), your Response to Comment #51 addressed the drawbacks to implementing the "pump and treat" system-water treatment and extraction in combination with the permeable reactive barrier's effectiveness and injection treatments' effectiveness. Upon review of the information the Water Board has given, there is the type of "pump and treat" treatment called "air stripping". In the Board's "Glossary of Environmental Terms" it is described as "*a treatment technology where contaminated water is run over packing material or trays inside an enclosed chamber...The volatiles evaporate from the water and are collected in air filters or released to the atmosphere.*" Could this air filtration remedial treatment process be compatible with the filtration remedial treatment of the permeable reactive barrier? Could this be a possible additional remedial treatment choice especially in handling the contamination in the A-Zone downgradient (in Len Hester Park, the Colony Park neighborhood...) from the installation of the permeable reactive barrier? And possibly elsewhere, if necessary?

As to other main cleanup technologies that the Water Board has presented, the ERM's Feasibility Study's presentation of various remedial alternatives considered did not include information on "air sparging & vapor extraction" treatment "*where air is pumped into the ground to aid in the removal of volatile substances.*" Could this be a compatible treatment with the chemical oxidation treatment process?

Closure of Private Wells

Upon review of the California Regional Water Quality Control Board San Francisco Bay Region's Tentative Order on page 7 mentioned surveys conducted that identified the existence of 12 private backyard wells. There was also mentioned "*as of the end of August 2006, 8 wells have been abandoned and are no longer used. The owners of the four remaining wells indicated that they do not use the wells, or the wells are used for irrigation purposes only.*" For the community's health and safety, The Water Board needs to enforce Institutional Controls for the proper closure of those wells that may pose harm. Also, the Institutional Controls should address any future private well construction.

Cancer Risk

On November 2, 2006, the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) published a document, "Response to Comments on Feasibility Study for Hookston Station Site, Pleasant Hill, Contra Costa County (July 10, 2006)." Within their response, the SFRWQCB addressed a comment # 69 from Janet L. Wolff. Ms. Wolff's comment (response to feasibility study) was:

Comment #69:

"The 'February 2006 C.T.E.H. Toxicology Report for the Baseline Risk Assessment', pages 39 and 40, states that there exists a cancer risk exposure for the Colony Park neighborhood and therefore 'needs further study'. The remedial action proposed by the (July 10) Feasibility Study is not based on 'further study' and therefore cannot be deemed acceptable as an acceptable specification for the proposed clean-up plan. Simply stated: the proposed Clean-up Plan is based on incomplete information."

The November 2, 2006 aforementioned document responded to this comment # 69 as follows:

"Response: There is no statement in the referenced report that calls for further study, evaluation, or sampling of the Hookston Station site or surrounding neighborhood. The Water Board believes that the characterization work was sufficient to prepare both the Baseline Risk Assessment and the Feasibility Study."

Our response to the above November 2, 2006 response to comment #69 is:

We acknowledge, for clarification, that there exists no direct statement in the February 2006 C.T.E.H. referenced report that calls for "further study, evaluation, or sampling of

the Hookston Station site or surrounding neighborhood.” However, additional study is indicated based upon the following:

1. The April 2006 “Fact Sheet” publication from SFBRWQCB states on page 2:

“Cumulative ‘worst-case’ theoretical excess lifetime cancer risks for offsite residents exposed to VOC’s in indoor air, groundwater, and surface water range from about 16 to 96 in one million” Included in this April 2006 publication is a table regarding “acceptable risk” This reference table indicates the associated range 1.0E-06 to 1.0E-04 as a “Risk Range that is not acceptable, but ‘Needs further Study’”. Therefore, this report, on its own, indicates the “need for further study.”

2. The February 2006 C.T.E.H. report indicates:

“... the range of calculated theoretical lifetime cancer risk was 1.5E-07 to 5.9E-05 using the first exposure estimate and 2.0E-07 to 8.0E-05 using the second exposure estimate.” Therefore, the high range of both estimates are well within the, “Needs Further Study” range, being respectively as much as 80 times the maximum allowed of acceptable risk (i.e. 8.0E-05 vs. 1.0E-06 max limit of acceptable risk) Also, note, this 8.0E-05 level is restated on page 7 of the November 22, 2006 SFBRWQCB of California RWQCB Tentative Order.

In conclusion, when looking at the risk ranges indicated in both referenced reports (February 2006 C.T.E.H. Toxicology Report for the Baseline Risk Assessment and California Regional Water Quality Control Board San Francisco Bay Region’s Tentative Order) they both fall under the California Regional Water Quality Control Board San Francisco Bay Region’s April, 2006 Fact Sheet’s Risk Range category that “Needs further study.” And such study has not yet occurred.

Regards,

Janet L. Wolff,
Trustee, Welch Family Trust

Mr. Chuck Headlee
California Regional Water Quality Control Board
San Francisco Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

November 26, 2006

NOV 28 2006
RWC
QUALITY CONTROL BOARD

Dear Mr. Headlee

Once again I object most strenuously to your characterization of the Hookston Plaza owners as "dischargers" with "the legal responsibility to prevent the discharge." You keep insisting on the same charges, as set forth in paragraph 3, page 2, of the most recent Regional Board order. This is the same erroneous language you used on the initial order and have stubbornly refused to change even when presented with factual information to the contrary. You compounded your error on at least three previous occasions when you wrote the draft of the letters that Ms Celeste Cantu, Executive Director of the SWRCB sent to me.

First of all you have no basis whatsoever for making the statements in paragraph 3. In point of fact the contamination occurred in the 1968-1970 timeframe. In our lawsuit against Southern Pacific Railroad this fact was proven by more than one sworn deposition. Individuals who work for Mag Wheels swore under oath that they used TCE as part of the Mag Wheels operations during 1968-1970. It was around 1970 that Mag Wheels moved to Benicia where they apparently contaminated another property.

We acquired the property in 1983. The math is easy. The property was contaminated 13 years, or more, before we acquired it. This is a matter of Federal District Court records. How could we possibly have known or prevented the discharge? Mag Wheels was the known discharger. They were tenants of the Southern Pacific Railroad. They were never our tenants. Moreover, it has also been proven in an evidentiary way, as part of the lawsuit, that none of our tenants have ever contributed to any contamination of the site.

When we acquired the site in 1983, environmental assessments were not a factor or part of the acquisition process. Hence, we did not learn of the contamination by Mag Wheels until 1989, when notified by Paul Gavey of the Contra Costa County Land Acquisition Department. On that very day I hired an environmental firm to evaluate the problem. Shortly after we started our investigation the Contra Costa County Hazardous Materials Division of the Department of Public Health received all of the consultants reports and directed the efforts of the environmental consulting firms that we hired and paid.

I know you are aware of these facts. I have communicated them to you on more than one occasion. What I do not understand is why you continue to assert what is not the truth. Do you feel you have to continue because this is what you wrote for the State Board? An official of Contra Costa County stated that your position is the reason why we are contending with two lawsuits in addition to paying for the cost of remediation. The burden of defending ourselves has already cost us over \$225,000.00 in addition to the remediation costs.

WE ARE NOT THE DISCHARGERS and resent greatly your continuing and continual efforts to cast us in this light. I am at a loss to understand why you refuse to recognize the facts. We are doing everything you are asking of us. You leave me no alternative but to interpret your continual insistence upon your view of things is because you have some other agenda.

We came to the Regional Board voluntarily and in good faith. The Hookston Owners have spent over \$1 million in complying with the Regional Boards directives. You have failed to place other up-gradient parties under an order even though you have known for four years of the presence of PCE emanating from their properties.

We have continued in good faith to work with the Regional Board and the only thing I ever asked was for you to get the our characterization correct. By operation of law we have become the responsible parties, **WE ARE NOT THE DISCHARGERS**. You are wrong on your facts. They are erroneous. Check with our attorneys or get the depositions I mentioned above. Why is it seemingly impossible for you to admit you made a mistake?

I am 77 years old. I have served my Country, my State, and my community with honor. I have had two strokes since this situation developed. My health is now poor, my wife has been distraught over this matter, especially with your insistence that we are responsible for discharging the contamination at the site. We did not do it and I will continue to resist your false charges to the utmost of my ability.

Sincerely,

Daniel C. Helix

cc: Mr. Bruce H. Wolfe
Ms Mary Rose Cassa
Mr. Stephen McKae. Esq.
Mr. John Hook
Mr. Stephen Pucell
Ms Elizabeth Young
Ms Nancy Ellicock

December 29, 2006

To: Mary Rose Cassa, PG
Hookston Project Manager
California RWQCB, SF Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

From: Lucy Goodell, Chair
Colony Park Neighbors Association
1261 Hookston Drive
Concord CA 94518

Subject: COMMENTS ON TENTATIVE ORDER FOR ADOPTION OF FINAL SITE
CLEANUP REQUIREMENTS FOR HOOKSTON STATION SITE

Dear Ms Cassa:

On behalf of the residents of Colony Park we offer the following comments.

CPNA has been actively involved with the Hookston Station Site and the processes of the Regional Board as lead agency since we became aware of the contamination under our neighborhood in the fall of 2002.

We concur with the TO establishing vapor intrusion ESL's as fundamental benchmarks in determining achievement of cleanup goals. Two things that we have never been comfortable with are the self monitoring program under which the site operates, and the Regional Board's unwillingness, until the last year, to take a conservative approach given the sensitive land use here in Colony Park. The Tentative Order, or operating indoor air testing work plan, should be amended to require testing to occur in the months of July and August with a minimum 80 degree outside air temperature, preferably over a twelve hour period versus 24 hours. A strong pro active effort should be made by Regional Board staff stressing to our neighbors the significance of the testing in relationship to determining clean up attainment, and the importance of keeping doors and windows closed. Individual sampling results should record outside air temperature at the beginning and end of the sampling period. Vapor intrusion is our primary exposure pathway.

The TO relies exclusively on a permeable reactive barrier to cleanse VOC's from the A zone waters before they enter the neighborhood, with no active mitigation in the neighborhood. Fate and Transport modeling is used as the basis to conclude that dilution and natural attenuation will neutralize existing VOC's responsible for vapor intrusion in homes. Extremely high levels of vinyl chloride (a daughter product of TCE) have been detected in a monitoring well in 2006. Already this calls into question the Fate and Transport modeling. Our concern is that either TCE has broken down and stalled to vinyl chloride, or there is an independent vinyl chloride source. Regional Board should be

prepared to act quickly if and when it is determined that the reduction of vapor intrusion will not occur within the timeframe specified in the chosen alternative.

Do the U.S. EPA guidelines for risk assessments indicate that the Board should rely on the Risk Assessment process to address actual exposure of VOCs to humans? Or do the residents of Colony Park have a right to clean air in their homes regardless of what the calculated risk level might be from a risk assessment? A Union Pacific toxicologist has gone on record stating that the risk assessment was not intended to be used as a health assessment document. We would like professional help from a State toxicologist on this matter to truly address the health concerns from exposure to the levels of TCE and PCE in homes.

Respectfully,
Lucy Goodell
Colony Park Neighbors Association, Chair

Cc: D. Mount, R. Block, J. Melloni

From: <Brian.Bjorklund@erm.com>
To: <mcassa@waterboards.ca.gov>
Date: 12/28/2006 10:29:49 PM
Subject: Tentative Order

Mary Rose,

The Tentative Order includes a compliance date of April 30, 2006 for Task C1b (page 14). Can you please change this to April 30, 2007? Also note that the Self Monitoring Program item 1 contains a placeholder for the order number, which should be filled in prior to adoption. I believe that Dan has provided comments on item 3 of the TO (Named Responsible Parties). I do not believe there are any other issues that have not already been addressed. Thanks.

Brian Bjorklund, PG CHG
ERM
1777 Botelho Drive, Suite 260
Walnut Creek, CA 94596
(925) 279-3226
(925) 946-9968 (fax)
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CC: <mjgrant@up.com>, <pmodlin@fbm.com>

Appendix C – Response to Comments

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

I N T E R N A L M E M O R A N D U M

TO: Bruce H. Wolfe
Executive Officer

FROM: Mary Rose Cassa
Senior Engineering Geologist

DATE: January 9, 2007

SIGNATURE: _____

SUBJECT: Response to Comments - Tentative Order – Final Site Cleanup Requirements for Hookston Station Site, 228 Hookston Road, Pleasant Hill, Contra Costa County

CONCUR: _____
Stephen A. Hill
Toxics Cleanup Division Chief

Board staff circulated the subject Tentative Order among interested parties in December 2006, requesting any written comments by December 29, 2006. Board staff met with the Community Working Group on December 7, 2006, to discuss the Tentative Order. We received comments from the responsible parties, a resident family, and the Colony Park Neighbors Association.

Summary

Significant comments fall into the following categories: naming dischargers; design of the proposed permeable reactive barrier; cleanup of pollution from other nearby releases to groundwater; health and safety related to the proposed remedies; more aggressive remediation of A-Zone contamination downgradient from the proposed permeable reactive barrier; closure of private wells; cancer risk; indoor vapor intrusion monitoring; monitoring and source identification for vinyl chloride; health assessment. Many of these comments pertain to issues that will be addressed during the remedial design phase. Other comments repeated earlier comments on the cleanup plan. Our November 2, 2006, responses to comments on the draft cleanup plan are still relevant, and are also included as an attachment to this memorandum. In response to these comments, we have revised the Tentative Order to correct typographic errors, modify the naming of responsible parties, and modify the timing of required indoor air monitoring. However, we do not recommend further changes to the Tentative Order.

Below is a more detailed description of the key points raised in these comments and our responses:

Daniel C. Helix (letter dated November 26, 2006)

1. Mr. Helix objects to being named as a discharger, asserting that the release to groundwater (discharge) occurred before he owned the property. Consequently, he had no control over the activities that resulted in the release (legal ability to prevent the discharge).

Response: We agree that the rationale for naming Mr. Helix needs additional clarification. Mr. Helix and the other Hookston Plaza owners are named as a Responsible Party because they currently own the property and have (and are presently acting on) the legal authority to prevent the ongoing discharge of pollutants to groundwater. On-going migration of contaminants through leaching from soil into groundwater and movement with the groundwater is also considered a release of contaminants to the environment. Implementation of the cleanup described in the Tentative Order will address ongoing releases from the source area. Finding 3 of the Tentative Order has been changed to clarify the rationale for naming Mr. Helix and the other Hookston Plaza owners.

Environmental Resources Management (e-mail from Brian Bjorklund, dated December 28, 2006, on behalf of Mr. Helix and Union Pacific Rail Road)

2. Mr. Bjorklund pointed out a typographic error which has been corrected.

Janet L. Wolff, as trustee of the Welch Family Trust Residence: 1260 Trafalgar Court, Concord (letter via e-mail, dated December 29, 2006)

3. Permeable Reactive Barrier (PRB): Ms. Wolff addressed specifics regarding design, health and safety plan, and remedy effectiveness.

Response: All design specifics such as length, width, orientation, composition, surface completion, effectiveness for treating lower concentrations toward the edges of the plume, and impacts to existing surface structures and plantings will be addressed in the Remedial Design and Implementation Plan, which is scheduled to be submitted on June 29, 2007. The community will have an opportunity to review and comment on the Plan via the Community Working Group. The Remedial Design and Implementation Plan will also include a detailed health and safety plan. The PRB is not intended to clean up pollution originating from other sites; however, it is expected to incidentally clean up some of the pollution originating from upgradient, west of Vincent Road. Cleanup of pollution related to petroleum products from the Pitcock Petroleum site will be addressed separately by the owners of that site. The mechanisms that have led to the formation of vinyl chloride detected in groundwater beneath Colony Park are not known at this time. Ongoing studies will provide information to help to address the source and develop a remedy, if needed.

4. Chemical Oxidation: Ms. Wolff requested clarification about potential effects on the nearby Kinder Morgan pipeline and risks from potassium permanganate (KMnO₄), and additional information for the community about the selected chemical.

Response: The oxidant injected near the source area on the Hookston Station property is not expected to have any effects on the Kinder Morgan pipeline, which is located about 300 feet downgradient from the main injection area. Details regarding the depth of the pipeline will be determined during the design phase. The optimum design will ensure that the KMnO₄ is consumed effectively and high concentrations do not migrate farther than necessary. Potential health and safety effects from KMnO₄ are mainly of concern for the technicians who will be handling the chemical. Concentrations achieved after injection into the subsurface are not expected to be sufficiently high to cause concerns for the general public.

Water Board staff will ensure that adequate information about the selected chemical is provided to the community before the chemical oxidation pilot test is implemented.

5. Vincent Road and Mayhew Way PCE Plume: The mitigation process for this plume should not be delayed due to lack of an identifiable responsible party.

Response: The Water Board must identify one or more responsible parties before cleanup of the Vincent Road/Mayhew Way plume can commence, and Water Board staff is working as quickly as possible to require additional site investigation to determine who is a responsible party. Orders pursuant to Water Code Section 13267 were sent to two property owners on December 14, 2006. Responses are due by January 26, 2007. As a practical matter, most of the PCE (and breakdown products) in groundwater will be treated by the proposed Hookston Station cleanup systems.

6. Selection of Remedial Alternative: Other “more aggressive” technologies should be considered for remediation of shallow groundwater downgradient from the PRB.

Response: The Feasibility Study considered a wide range of alternatives, but the nature of the shallow groundwater zone poses a challenge to any alternative. As stated in the Response to Comments on the Feasibility Study, the discontinuous nature of permeable lenses in the A-Zone makes development of an appropriate well network for injection of treatment materials or extraction of contaminated groundwater for treatment at the surface problematic. The preferred option is to evaluate the effectiveness of treatment using the PRB, through the design process and through post-installation monitoring. Task 9 in the Tentative Order requires a status report on remedy effectiveness, at which time the need for a different or additional remedy would be evaluated.

7. Closure of Private Wells: The Water Board should enforce institutional controls for proper closure of private (“backyard”) wells that have not yet been abandoned, and the institutional controls should address any future private well construction.

Response: We agree. We have encouraged private-well closures in the plume area, and the Tentative Order contains provisions to prevent new wells from being installed in the plume area. Task 7, Proposed Institutional Constraints, includes restrictions to ensure that current and future landowners are not permitted to install new water supply wells until the final groundwater cleanup goals are achieved. It is expected that the restrictions will be crafted such that the Water Board (or a designated agency) will take enforcement against violations of the restrictions. The Proposed Institutional Constraints will be made available for review and comment by the community via the Community Working Group.

8. Cancer Risk: Additional study is required to address the estimated cancer risk that is within the range of 1×10^{-6} to 1×10^{-4} .

Response: The determination that cancer risk in the range of 1×10^{-6} to 1×10^{-4} exists in the Colony Park neighborhood from exposure to volatile organic compounds in indoor air, groundwater, and surface water has led to the requirement to remediate groundwater impacted by releases at the Hookston Station property. Interim remedial measures include the installation of vapor intrusion mitigation systems in homes where TCE concentrations

exceed risk-based concentrations. The “additional studies” recommended by USEPA and CalEPA for sites having estimated cancer risks within the range of 1×10^{-6} to 1×10^{-4} largely consists of studies to evaluate and design appropriate remedial alternatives, implement the remediation systems, and evaluate the effectiveness of the systems. Additional studies in the form of health assessments are not within the purview of the Water Board. The California Department of Health Services and Contra Costa County Division of Environmental Health are the agencies that normally conduct such studies, and they are aware of the past and present health threats in the Colony Park community.

Lucy Goodell, Chair, Colony Park Neighbors Association (letter via e-mail dated December 29, 2006)

9. Indoor Air Monitoring:

- a. Amend Task 4 in the Self Monitoring Plan (Indoor Air Monitoring) to require monitoring to occur in the months of July and August with a minimum 80 degree outside air temperature, preferably over a twelve hour period.
- b. The Water Board should make a strong pro-active effort to stress to the community the significance of the monitoring in relationship to determining cleanup attainment, and the importance of following the guidelines for indoor air testing (e.g., keeping doors and windows closed).

Response:

- a. We agree that the summer sampling should focus on the warmer months. The Self Monitoring Plan has been amended to require monitoring to be completed no later than August 31 each year, and the outdoor air temperature is to be recorded at the beginning and end of each sampling period. The intent of the sampling is to determine average daily concentrations of the monitored compounds descriptive of long-term exposure to vapors migrating from the sub-surface to indoor air, rather than to evaluate a worst-case scenario. Samples collected over a 24-hour period will more accurately account for occupant use patterns over the course of the day. Consistent with DTSC's *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air*, we conclude that indoor air samples collected over a 24-hour period will more accurately describe the representative indoor air concentrations over a long-term chronic exposure. For the same reason, we conclude that it's not necessary or appropriate for Water Board staff to instruct residents to modify their home-ventilation practices during indoor-air testing periods.
- b. We agree that Water Board staff needs to do a better job of communicating to the community members the importance of the required indoor air monitoring and of the associated implementation guidance. However, we cannot force homeowners to grant the required access or follow the guidance. We have learned during earlier monitoring events that personal matters sometimes prevent community members from participating in the monitoring program. The assistance of other community members in this communication effort is greatly appreciated, and can also be facilitated through the Community Working Group.

10. Vinyl chloride in groundwater beneath the Colony Park neighborhood: Concern that natural breakdown of TCE has stalled at the vinyl chloride phase.

Response: The cause and extent of vinyl chloride in groundwater in groundwater beneath Colony Park is being addressed, and concentrations in groundwater and soil vapor will be closely monitored. This will be accomplished by implementation of a Workplan required by a Water Code Section 13267 order dated November 13, 2006. Additional homes will be added to the indoor air monitoring program if warranted.

11. Exposure to VOCs in homes: Does the Risk Assessment process address actual exposure of VOCs to residents in Colony Park? Do the residents of Colony Park have a right to clean air in their homes, regardless of what the calculated risk level might be from a risk assessment? Residents would like professional help (from a State toxicologist) to truly address the health concerns from the exposure to TCE and PCE in homes.

Response: The previously-approved risk assessment estimated actual exposure of residents to VOCs in indoor air, based on Board-approved indoor air sampling. The Tentative Order requires ongoing indoor air sampling to confirm these initial results and document changes following groundwater cleanup. Clean indoor air is a worthy goal; however, there are numerous sources of indoor air contamination, including outdoor air contaminants (e.g. benzene), in-home sources such as building materials and personal products, and vapor intrusion from soil and groundwater.

The Water Board has jurisdiction over the vapor intrusion component, and is requiring cleanup and mitigation to eliminate unsafe concentrations of VOCs related to this source. The required cleanup and mitigation will prevent future exposure to TCE originating from vapor intrusion. As with the engineered groundwater remediation systems, the vapor intrusion prevention systems installed in homes will also prevent future exposure to PCE originating from vapor intrusion. After a responsible party is identified for the Vincent Road/Mayhew Way PCE release, Water Board staff will also consider the need for additional cleanup and mitigation to address exposures to PCE (i.e., homes where indoor air concentrations of PCE are higher than TCE and the source is vapor intrusion from soil or groundwater.

It is beyond the Water Board's authority and expertise to assess potential health effects from past exposure. Public health agencies such as Contra Costa County Environmental Health or California Department of Health Services Environmental Health Investigations Branch do have the authority and expertise to address these concerns. We have previously related these concerns to both agencies, and we encourage the commenter to follow up with these agencies.

Attachment: Responses to Comments on Feasibility Study [Cleanup Plan]: November 2, 2006.



California Regional Water Quality Control Board

San Francisco Bay Region



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San Francisco Bay Regional Water Quality Control Board Response to Comments on Feasibility Study for Hookston Station Site, Pleasant Hill, Contra Costa County (July 10, 2006)

This document summarizes comments received by Water Board staff on the Feasibility Study for the Hookston Station area that was submitted by the Hookston Station responsible parties on July 10, 2006, in response to Water Board Order No. R2-2004-0081 (site cleanup requirements), as amended.

For reference, we have numbered each comment sequentially as follows:

- Comments 1 through 48: Questions and Comments from Hookston Station Cleanup Plan Community Meeting - August 10, 2006.
- Comments 49 through 55: Comments from Lucy Goodell of the Colony Park Neighbor's Association dated August 29, 2006.
- Comments 56 through 59: Comments from Colleen Goya dated August 6, 2006.
- Comments 60 through 63: Comments from Amy Brownell dated August 31, 2006.
- Comments 64 through 66: Comments from Richard Nicoll, Mount Diablo Unified School District, dated August 30, 2006.
- Comments 67 through 71: Comments from Janet L. Wolff, on behalf of self and as trustee of the Welch Family Trust Residence: 1260 Trafalgar Court, Concord, California 94518, dated August 31, 2006

We have provided each of the public comments in italic type. Our responses immediately follow each comment. Tri-S Environmental, on behalf of Walnut Creek Manor, submitted comments to the Water Board in a letter dated 31 August 2006. Those comments will be addressed separately, as they are primarily related to the Remedial Investigation and Risk Assessment reports, not the FS. A list of acronyms appears at the end, after Comment 71.

Questions and Comments from Hookston Station Cleanup Plan Community Meeting - August 10, 2006

Remedial Technologies

1) ***What will happen to TCE concentrations in the groundwater northeast (down gradient) of the PRB?***

Response: The PRB will reduce the concentrations of site-related VOCs in ground water passing through it. Concentrations of VOCs in groundwater already downgradient of the PRB will therefore be reduced by a combination of dilution, dispersion, and other natural degradation processes. We expect decreases in VOC concentrations to start nearest the PRB and propagate downgradient (northeastward) as cleaner groundwater moves down-gradient.

2) ***The PRB will be difficult to implement. What will happen if it doesn't work?***

Response: PRBs have been shown to be implementable and effective at sites with conditions similar to the Hookston Station site. The RPs will perform a treatability study to verify the effectiveness of zero valent iron (the reactive component the PRB) to treat the VOCs in ground water before the PRB is installed. The PRB contractor will design the PRB to be effective for this application. The SCR will require monitoring and will allow the Water Board to require mid-course corrections (adaptations in the selected remedy or shifting to a different remedy) if the remedy does not appear to be performing as expected.

3) ***Will the PRB be entirely underground?***

Response: Yes. The PRB is designed to treat ground water in place. Unlike pump-and-treat systems, there are no above-ground components and no maintenance activities associated with a PRB. There will be only temporary construction-related surface disturbance.

4) ***Will there be a risk to residents from soil that is excavated during trenching?***

Response: A Health and Safety Plan will be prepared as part of the Remedial Design to address worker and resident health and safety. If a trenching method is used for the PRB installation, it is not anticipated that vapor concentrations will exceed permissible levels for short-term exposures, however, air monitoring during excavation will be performed to confirm this.

5) ***How will the potassium permanganate be installed?***

Response: A water-based solution of chemical oxidant (e.g. potassium permanganate) will be injected using a specialized direct-push injection rig and a pump. The method essentially involves driving a metal rod to the desired depth and injecting the desired quantity of oxidant. The injections will all occur on the Hookston Station parcel only, away from the residential neighborhood.

6) *What are the effects of the oxidant on underground utilities? On the Kinder-Morgan pipeline?*

Response: The oxidant will only be injected into the B-Zone ground water, which is approximately 40 to 60 feet below ground surface. Underground utilities at the site are present at shallow depths (generally from 3 to 10 feet below ground surface). In addition, construction depths of the underground utilities will be reconfirmed with the utility companies prior to implementing the proposed remedial alternatives for the A-Zone and B-Zone. The Remedial Design will address the plan for identifying, marking, and temporarily relocating utilities as necessary.

7) *How is the groundwater “encouraged” to flow in to the PRB?*

Response: Ground water will flow through the PRB under the natural hydraulic gradient that exists in the treatment area because the PRB will be more permeable than the surrounding soils. No external forces (such as a pumping well) are needed to cause water to flow through the PRB.

8) *How will the arsenic in the soil at the Hookston Site be cleaned up?*

Response: As described in Section 6.3.1 of the FS, the single isolated location of elevated arsenic in soil (located at a depth of about 2 feet below ground surface on the Hookston Station parcel itself) would be addressed through the use of institutional controls to prevent future exposures. Section 6.3.1 of the FS describes the Soil Management Plan that will be prepared to address arsenic exposures to site workers. No current active cleanup would be performed.

9) *How is arsenic affected by the remediation (chemical oxidation, in particular)?*

Response: The remediation in the A-Zone and B-Zone ground water will not affect the single isolated location of elevated arsenic in soil (which is at the Hookston Station parcel itself).

10) *Are there other chemicals that are not being cleaned up?*

Response: The FS addresses all chemicals in ground water that are of a type that may have originated from the Hookston Station parcel. The proposed remedy will incidentally clean up some non-Hookston chemicals (e.g. PCE originating at the Vincent Road parcels). The proposed remedy will not clean up petroleum constituents originating at the Pittcock Petroleum site, but the Water Board will require Pittcock to clean these up under separate orders.

11) *Consider a more active cleanup, such as groundwater extraction and treatment or injection of zero-valent iron, down gradient from the PRB; or consider a phased approach with 1 or 2 quarters of monitoring to see if more aggressive cleanup is required.*

Response: The FS has evaluated ground water extraction under Alternative 6, which ranked lower than the recommended alternative based on long term effectiveness; reduction of toxicity, mobility, and volume of contaminants; cost; and implementability. The Remedial Design will include a detailed performance and monitoring schedule, subject to Water Board approval. We expect it will take more than one or two quarters to observe meaningful changes in groundwater

concentrations that would indicate if the selected remedy is performing as expected. The Final Site Cleanup Requirements will contain “re-opener” language in the event the selected remedy does not perform as expected.

12) *Continue (implement) remediation work in the core area, even while the barrier is being installed.*

Response: The initial pilot test phases of chemical oxidation in the B-Zone plume core area may occur prior to the installation of the A-Zone PRB. The Water Board’s final SCR will include a specific implementation schedule for the implementation tasks.

13) *What is zero-valent iron and what are the risks?*

Response: Zero-valent iron is elemental iron; for the purposes of this application, it is in granular form. The iron granules destroy dissolved volatile organic compounds (VOCs) in ground water, including common chlorinated solvents such as tetrachloroethene (PCE), trichloroethene (TCE), dichloroethenes (DCEs), and vinyl chloride (VC). The degradation process occurs without the involvement of microorganisms (abiotic), whereby chemical reactions on the surface of the granular iron cause the replacement of a chlorine atom (a halide) on an organic compound by a hydrogen atom (reductive dehalogenation). The reactions result in the net addition of two electrons to the organic compound, with the iron acting as an electron source. During the dehalogenation process, the halide on the compound (e.g., chloride) is replaced by hydrogen, resulting in the transformation of halogenated VOCs to ethene, ethane, methane and halide ions.

14) *What is potassium permanganate and what are the risks?*

Response: Potassium permanganate (KMnO₄) is a strong oxidizing agent. As an oxidizing agent it has the ability to add oxygen, remove hydrogen or remove electrons from an element or compound. As a strong oxidizer, KMnO₄ should be kept separated from oxidizable substances. Dilute solutions of KMnO₄ and water are not dangerous. KMnO₄ forms dangerous products upon contact with concentrated acids.

In addition to its use in environmental remediation, KMnO₄ has been used throughout the United States to treat drinking water supplies. KMnO₄ is recognized by its characteristic purple to pink color when made into a solution. In higher concentrations it is a dark purple color.

15) *Will the remedy leave more toxic residues?*

Response: No. The remedial technologies recommended in the FS break down TCE and its environmental breakdown (daughter) products completely to non-toxic residues.

16) *Does the proposed remedy clean up PCE?*

Response: PCE is the same class of chemical as TCE. The PRB and chemical oxidation processes are both effective for remediating PCE.

17) *Does the chemical turn into gas? Where does it go?*

Response: No, the chemical processes described in the FS do not create gas. The reaction between an oxidant, such as potassium permanganate, and dissolved TCE breaks the bonds between carbon atoms and removes chlorine atoms from the individual molecules resulting in the production of non-toxic byproducts (e.g., ethene). Similarly, the reaction between the iron in the PRB and dissolved TCE also results in the production of non-toxic byproducts. The small amounts of dissolved chlorine very slightly increase the groundwater salinity.

18) *Please include in the cleanup plan a case study of a site that has been cleaned up using a remedy similar to that being proposed.*

Response: Chemical oxidation and PRB remediation projects are numerous and well documented. Feasibility Studies do not typically include (nor are they required to contain) case studies from other sites. However, there are several good online resources that summarize remedial technology applications at other similar sites, including the following:

- PRB References:
 - <http://www.rtdf.org>
 - <http://www.eti.ca>
- Chemical Oxidation References:
 - http://www.itrcweb.org/gd_ISCO.asp
 - <http://www.epa.gov/tio/download/remed/chemox.pdf>

A recent PRB installation at Hill Air Force Base, which was designed specifically to shorten the timeframe of TCE vapor intrusion impacts to a residential neighborhood, is described in this article: <http://www.hilltopnews.com/story.asp?edition=184&storyid=5275>

19) *Does the Water Board have any experience with PRBs? Please provide an example of a successful application of PRB technology.*

Response: The San Francisco Bay Regional Water Board has overseen the implementation of six zero valent iron PRBs since the mid-1990s (Alameda Point (former Naval Air Station), Alameda; Intersil Semiconductor, Sunnyvale; Fairchild/Applied Materials, Sunnyvale; Mohawk Site, Sunnyvale/Santa Clara; Moffett Federal Airfield, Mountain View; Travis Air Force Base, Fairfield). All PRBs appear to have functioned as designed. The most recent, a PRB that is 700 feet long and 20-35 feet deep, was installed at the Mohawk site in Sunnyvale, Santa Clara County. The average concentrations immediately downgradient from the PRB are below the target concentration for total VOCs of 600 ug/l, indicating the zero-valent iron in the PRB is effectively reducing total VOC concentrations. Total VOC concentrations in monitoring wells located approximately 100 to 150 feet downgradient of the PRB have declined approximately 70 percent since the PRB was installed. The RPs use the quarterly monitoring data to refine the conceptual model of the PRB performance. For further information, this site is posted on GeoTracker (<http://geotracker.waterboards.ca.gov/>).

20) *Please address the potential explosive properties of potassium permanganate.*

Response: Dilute water-based oxidant solutions that may be used for this project, such as potassium permanganate, do not pose an explosive hazard.

21) *What is the effect of other chemicals (MTBE, petroleum, PCE) on the TCE and the performance of the PRB?*

Response: None of these chemicals impair the performance of the PRB. In addition, petroleum hydrocarbons enhance the degradation of PCE and TCE to lesser-chlorinated ethenes, such as 1,1-DCE and vinyl chloride. Zero valent iron is effective at treating dissolved chlorinated ethenes, such as TCE and PCE; however, it is not expected to be effective on petroleum hydrocarbons or MTBE.

22) *Will vinyl chloride replace TCE as the primary contaminant in the groundwater?*

Response: No. The PRB and potassium permanganate injection will be designed to completely degrade chlorinated compounds in the ground water to non-toxic residue. Vinyl chloride is not expected to be present within the downgradient treated water. We have not seen vinyl chloride created at other sites in our region where these cleanup technologies have been used for TCE.

23) *The cost of implementing and monitoring the Institutional Control to prohibit future well installation (e.g., County ordinance) should be included in the cost estimate and borne by the RPs instead of the County/taxpayers. Experience has shown that such costs may be substantial. They are not fully accounted for in the current cost estimates.*

Response: Because this Institutional Control is a common component to all of the remedial alternatives (other than the no-action Alternative 1), the costs associated with this task do not differentiate one alternative over another. The costs associated with this task will be negotiated between the County and the RPs. Further, the Water Code does not allow the Water Board to allocate “cleanup and abatement” costs among parties.

Monitoring

24) *Will there be more testing beyond (more frequent than) quarterly monitoring?*

Response: As described in Section 8.4.1 of the FS, ground water monitoring activities are proposed for 30 years following the completion of the construction of remedial actions. Monitoring will be conducted on a quarterly basis for the first 5 years for the A-Zone and for the first 3 years for the B-Zone. The long-term monitoring program will be set forth in the Final Site Cleanup Requirements. Additionally, a detailed performance monitoring program will be included in the Remedial Design, subject to Water Board approval.

25) *How do you know the technology is working?*

Response: Water quality monitoring will provide information on the effectiveness of the remedial measures. Ground water monitoring wells will be located upgradient and downgradient of the treatment areas. A detailed performance monitoring program will be included in the Remedial Design. The monitoring program will be designed to track performance, including concentrations over time.

26) *The proposed monitoring wells do not appear to be sufficient to determine that ground water is not flowing around the ends of the wall, rather through it as planned.*

Response: The PRB is not really a wall. It is constructed with materials that are more permeable than the surrounding soils. Because the PRB is more permeable, ground water should flow through the PRB and not around the ends of the PRB. A monitoring network using new and existing monitoring points in the immediate vicinity of the PRB (upgradient, downgradient, and at the ends of the PRB) will be used to evaluate its effectiveness. The locations of these monitoring points and monitoring frequency will be described in the Remedial Design, subject to Water Board approval.

27) *Consider more frequent monitoring (more frequent than quarterly), then reduce monitoring if things appear to be going well.*

Response: The monitoring schedule presented in the FS proposes more frequent monitoring during the initial several years following completion of the remedial actions, followed by less frequent monitoring. Because the remediation can only occur as fast as the speed of ground water flow, more frequent monitoring (e.g., monthly) will not necessarily provide a better understanding of remedial effectiveness. A more detailed monitoring program will be included in the forthcoming Remedial Design, subject to Water Board approval.

Indoor Air

- 28) *After the vapor mitigation systems are turned off (predicted 3-4 years in the Feasibility Study) what is the guarantee that the TCE levels inside the homes will not go back up?***

Response: Indoor air monitoring activities are currently being conducted in homes with vapor intrusion prevention systems on an annual basis. Indoor air monitoring activities will continue to be conducted within these homes after the vapor intrusion prevention systems are turned off to confirm TCE concentrations in indoor air do not increase above the cleanup goal. An effectiveness monitoring program for indoor air will be included in the Remedial Design, subject to Water Board approval

- 29) *Will there be “post-turn off” monitoring in the homes that have vapor intrusion prevention systems? What kind of assurance do the homeowners have that constant air testing will take place even after the time when the vapor mitigation systems are turned off?***

Response: Yes, indoor air monitoring will be conducted in residences after the vapor intrusion prevention systems are turned off. Details of this monitoring program will be included in the Remedial Design, subject to Water Board approval. Indoor air monitoring will also be included in the Self-Monitoring Program, which will be part of the final SCR adopted by the Water Board to assure implementation of the cleanup plan.

- 30) *Will more houses need vapor mitigation systems?***

Response: The Water Board has required the Hookston Station RPs to conduct annual indoor air sampling at selected homes in the residential neighborhood. The locations of these homes are based on ground water concentration data and the results of the initial indoor air sampling events. The Summer 2006 event ended October 15, with results to be reported by November 30, 2006. As described in Section 8.4.2 of the FS, the results of the annual indoor air sampling activities will determine the need for expanding the network of vapor intrusion prevention systems.

- 31) *There appears to be a house outside the central core area that exceeds the screening level for TEC in indoor air. The Water Board should consider indoor air testing for homes beyond the core area.***

Response: On July 28, 2006, the Water Board directed the RPs to complete annual (summer season) indoor air sampling and analysis for homes that are generally located within 100 feet of the 500 micrograms per liter (ug/l) TCE groundwater iso-concentration contour in the A-Zone (based on historical data). This area is based on *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air* (DTSC, February 2005), including the recommended 100-foot stepout beyond the footprint of the appropriate groundwater screening concentration. This area is subject to modification by Water Board staff, based on analytical results. The first two rounds of indoor air sampling covered a much larger area and did not find significant TCE concentrations in indoor air outside the 500 ug/l TCE iso-concentration contour. Residents with specific concerns about their home should contact Mary Rose Cassa, the Water Board project manager.

32) *Was the second story/attic sampled in two-story houses?*

Response: Yes, it has been the practice to collect samples from the second floor of two-story homes. Although the second floor might not have been sampled in some two-story homes in the early phases of indoor air monitoring, the July 28, 2006, directive states that samples shall be collected from the second floor of two-story homes.

Schedule

33) *Please share with the public the reasoning behind the timeline for implementation of the cleanup so community members can be confident that the cleanup is occurring as quickly as possible.*

Response: The schedule proposed in the Feasibility Study represents the fastest time-frame that can reasonably be expected for completing these tasks in a manner that is safe, effective, and consistent with legal requirements. Water Board staff will work closely with the RPs to facilitate timely review of submittals. The installation of vapor intrusion prevention systems and well abandonments, initiated by the RPs several years ago, serve to eliminate exposures to TCE at concentrations above conservative theoretical risk-based screening levels.

34) *Can the entire process be speeded up?*

Response: Remedial construction efforts require significant planning, coordination, permitting, and approval durations to ensure that the project is completed in a safe and effective manner. Following approval of the Feasibility Study, the RPs must perform field and laboratory tests related to the selected remedial technologies in order to design the remediation systems. Based on the results of these tests, the RPs then will design the full remediation systems. The Regional Board must then review and approve this design with input from the community via the Working Group. Once the design is approved, the RPs must obtain a variety of permits, negotiate access agreements, and contract with vendors before any construction can commence. As stated in the response to Comment 33, the proposed schedule in the Feasibility Study represents the fastest timeframe that can reasonably be expected for completing these tasks in a manner that is safe, effective, and consistent with legal requirements. The Preliminary Implementation Schedule in the FS assumes concurrent implementation of several tasks. Some work, such as the bench-scale treatability study for zero-valent iron, is currently underway. Additionally, the RPs are evaluating the possibility of accelerating the B-Zone chemical oxidation work.

35) *How does the Water Board keep the Responsible Parties on schedule?*

Response: The Final Site Cleanup Requirements Order, which will be prepared pursuant to Water Board Section 13304 and adopted by the Water Board in early 2007, will include requirements for milestone completion dates and final cleanup concentrations. The draft Order will be circulated for public comment and reviewed at a Community Working Group meeting prior to the Water Board hearing.

Pitcock Petroleum

36) *Will the Pitcock Petroleum plume be pulled into the Hookston Station cleanup system?*

Response: The proposed remedial alternative would not be designed to capture ground water contaminants from an off-site parcel. Even if the petroleum plume does flow passively into the PRB, it will not adversely affect the system's ability to remove TCE and related chemicals.

37) *Will the hydrocarbons from the Pitcock plume affect the TCE plume?*

Response: Hydrocarbons can increase biodegradation rates in dissolved solvent plumes and as such can have a positive effect on TCE plumes.

38) *Please clarify the impact of the Pitcock petroleum plume on the Hookston plume:*

- *Extent of overlap*
- *Difference between chemicals*
- *Source of chemicals*
- *Treatment options*

Response: In general, Pitcock Petroleum wells contain elevated concentrations of petroleum hydrocarbons, which include benzene, toluene, ethylbenzene, xylenes, and MTBE. The property has been operated as a bulk fueling facility since the 1950s; activities associated with bulk fueling at Pitcock Petroleum are the likely source for these impacts. The Pitcock Petroleum plume appears to parallel the Hookston plume, but has not been completely defined. Consequently, the complete extent of overlap (if any) has not been determined. Pitcock Petroleum is currently conducting investigation activities to further characterize the downgradient extent of their plume, which is dominated by the gasoline additive MTBE. The ground water plume originating from the Hookston Station Parcel consists of chlorinated volatile organic compounds, including TCE and associated degradation compounds. TCE is a solvent commonly used as a degreaser. Existing soil vapor, soil, and ground water data suggest the TCE was released in the southwestern portion of the Hookston Station Parcel, near the structure identified as 199 Mayhew Way.

The remedial measures proposed in the FS will address the chemicals originating from the Hookston Station Parcel. None of the chemicals associated with the Pitcock Petroleum plume will impair the performance of the PRB. In addition, petroleum hydrocarbons enhance the degradation of PCE and TCE to lesser-chlorinated ethenes, such as 1,1-DCE and vinyl chloride. However, the zero valent iron PRB is not expected to be effective on petroleum hydrocarbons or MTBE.

39) *What are the challenges to site investigation and cleanup at the Pitcock Petroleum site?*

Response: Thus far, gaining access to off-site locations (other property owners, publicly-owned property) has posed the most significant challenge.

40) *Has the Pitcock contamination extended to Len Hester Park?*

Response: We don't know yet, but we will find out soon. Based on recent sampling (GRIBI Associates; April 27, 2006), Water Board staff directed Pitcock Petroleum to implement additional investigation to attempt to delineate the northeast (downgradient) extent of the petroleum plume. Water Board staff approved a workplan on August 23, 2006 to advance nine additional borings in Len Hester Park. Results are due November 1, 2006. If the petroleum plume extends beyond Len Hester Park, we will require the RP to conduct additional sampling, which will likely take place in the public rights-of-way in Colony Park.

41) *What is the regulatory tool for Pitcock Petroleum?*

The Water Board has used Water Code section 13267 (requirement for technical report) to regulate the Pitcock Petroleum site. We use this tool for many contamination sites, including virtually all leaking underground storage tank sites.

General Concerns

42) *Would any Water Board employees or RPs live in our neighborhood (given the health dangers)?*

Response: The existence of groundwater contamination in the vicinity is just one of many factors that people consider when deciding where to live. Interim actions already taken by the RPs (installation of vapor intrusion vapor prevention systems and well abandonments) have eliminated current exposures to harmful TCE levels. Planned cleanup actions will eliminate the source of TCE vapor intrusion to homes, so buyers of homes in this neighborhood will not face any health dangers from the groundwater contamination

43) *What is the status of identifying a responsible party for the release at Vincent Road and Mayhew Way and getting them to clean up the PCE?*

Response: The Water Board has already required three parties near Vincent Road to perform site investigation work, which has identified a likely source of PCE near the boundary between two properties. Additional site investigation is needed at both properties, and we are in the process of requiring this additional work. The Water Board will name responsible parties based on the results of a fuller site investigation.

44) *What is the status of the proposed investigation at 999 Bancroft Road?*

Response: The owner of 999 Bancroft Road refused to provide access. The Hookston Station RPs conducted the remainder of the investigation as approved by Water Board staff in May 2006. The results indicated there is no need at this time to pursue investigation on the 999 Bancroft property as an additional source area. See

<http://www.waterboards.ca.gov/sanfranciscobay/sitecleanup/docs.htm> for details.

45) *There should be coordination with the County Health Department regarding historic and future impacts to public health from the plume. A health survey of past and present should be maintained over the course of the remediation process.*

Response: The Water Board does not conduct epidemiological (health) studies. It is up to the California Department of Health Services or the County Health Department to determine if such studies are appropriate and, if so, implement them. Both agencies are aware of the community's concerns.

46) *Since there is no evidence of cancer caused by PCE and TCE, are my neighbors and I in Colony Park the ones who will become your statistical base during the next 30 years of cleanup?*

Response: While there may be no evidence of cancer caused by PCE and TCE in Colony Park, there is considerable evidence that these chemicals do cause cancer. As stated above, epidemiological studies are the responsibility of the County Health Department.

47) *Who hires the contractors?*

Response: It is the responsibility of the RPs to hire qualified consultants to carry out the cleanup. The consultants may elect to hire subcontractors for specialty work. The Water Board's site cleanup requirements order requires that the RPs' contractors have appropriate qualifications.

48) *Will residents living close to the trench have more input in the process?*

Response: Water Board staff will work closely with residents who live close to construction activities to make sure the residents know what to expect regarding construction and schedule and to ensure residents' concerns are heard and addressed.

Comments from Lucy Goodell of the Colony Park Neighbors Association dated August 29, 2006:

49) *We would like the plan to include specific benchmarks in time (1 year after implementation?) to determine whether or not sufficient degradation is occurring under our homes to meet the three to four year expected decrease in vapor intrusion to acceptable levels.*

Response: Specific deadlines will be established in the Site Cleanup Requirements. Ground water and soil vapor data will be collected during quarterly monitoring events following the

completion of the remedial measures. These data will be evaluated to confirm the PRB is reducing TCE concentrations in A-Zone ground water. The timeframes for cleanup are estimated and should not be considered absolute. As described in the introduction to Appendix I (Ground Water Modeling) of the FS, the computer models were constructed as a tool to compare the relative effectiveness (e.g., spatial impact and timeframes for VOC concentration reductions) of active remediation systems that were being evaluated within the FS.

50) *We would like to know how adaptable the selected alternative is. If the plan comes up short of expectations within the benchmark time period can course corrections be made to get the remediation back on track?*

Response: The selected alternative the PRB could be extended if groundwater flow patterns change or if performance monitoring indicates the PRB is not performing as expected. For the chemical oxidation component, injection points could be added or additional injection events could be added. However, we don't expect very rapid changes in contaminant concentrations following startup of the cleanup technologies, so we will need to observe system performance for several quarters before considering adaptive changes. The vapor intrusion prevention systems have been implemented along with water well abandonments to eliminate exposures to TCE at concentrations above conservative theoretical risk-based screening levels. The vapor intrusion prevention systems are adaptable in that they are relatively easy to install and have readily adjustable operating time periods. The vapor intrusion prevention systems eliminate the residential exposure to TCE in indoor air at concentrations above the risk-based cleanup goals pending reduction of TCE in A-Zone ground water.

51) *There was no consideration of an alternative combining in situ treatment with pump and treat.*

Response: In general, these two technologies (in-situ treatment and "pump and treat") are incompatible and it would make no sense to combine them on a particular site. Regarding the A-Zone, PRBs are designed to clean up groundwater under natural groundwater flow conditions. Increasing the flow through the PRB with an extraction system could have the negative effect of reducing contact time with the zero-valent iron, therefore potentially limiting the effectiveness of the PRB. Although "pump and treat" is technically implementable, the low permeability soils in the A-Zone would require an extensive well network with no guarantee that the wells would be effective in drawing and treating water in the areas between the wells. Siting of wells is strongly controlled by access. Using public rights-of-way generally assures ready access, but may not allow favorable positioning for optimum well performance. Table 5-2 of the FS describes some of the other reasons why groundwater pumping was not retained for further analysis in the FS.

Regarding the B-Zone, in situ treatment typically is not combined with extraction technologies, unless the treated water is going to be re-injected – a difficult and problematic process. The reason for not combining in situ and "pump and treat" is that the extraction system would result in removing whatever substance was injected into the ground water (e.g., potassium permanganate).

52) *Primary concern to our neighborhood is contamination already in the ground water below our homes. Concern for this matter was reflected at the meeting at Fair Oaks School where several people suggested remediation within the neighborhood in*

addition to the permeable reactive barrier. We don't see how the permeable barrier can be really effective in the hot spots beyond stopping the plume from spreading and getting worse. The concept of meaningful natural degradation and attenuation of TCE has not occurred in the last 13 years on the plume. Can we realistically expect this as a means of degrading the TCE in the hot spots under the houses just by virtue of stemming the additional flow from upgradient?

Response: Natural degradation and attenuation of TCE has been taking place, and is one reason why the plume has not been expanding. Installing the PRB will help to cut off the source of TCE upgradient from Colony Park, resulting in increased rates of attenuation and degradation. In addition, vapor intrusion prevention systems will be installed in those homes that exceed conservative risk based screening levels. Risk reduction over “hot spots” can be immediately achieved through the installation of such a system. See also the response to Comment 19, regarding Water Board experience with PRBs.

53) *To what extent has the Water Board or ERM had prior experience with the use of iron? It is an expensive project to see if it works when we know pump and treat does work and is more effective.*

Response: See response to Comment 19 regarding Water Board experience with PRBs.

ERM has designed and overseen construction of many PRBs in the United States and Europe. Some examples are listed below.

Location	Contaminant	Type of PRB
South Georgia	Pesticides	Carbon; Funnel and Gate
McGregor, Texas	Perchlorate	Series of Bio-Trenches (mixture of compost, soybean oil, and nutrients)
Washington	BTEX	Peat Moss
San Antonio, Texas	Chlorinated VOCs	Iron
Los Alamos, New Mexico	VOCs and Radionuclides	Multi-Media
Lake City, Missouri	Chlorinated VOCs	Iron
Kansas	Chloroform	Iron and EHC
Shaw, South Carolina	Chlorinated VOCs	Iron
New Hampshire	BTEX, Ketones, Chlorinated VOCs	Aerobic (calcium sulfate injection) and Anaerobic (ethanol and lactate injection) Bio-Trench

Location	Contaminant	Type of PRB
Belgium	Chlorinated Solvents	Bi-Metallic Pd-Coated Iron “Cartridge” System

BTEX = Benzene, toluene, ethylbenzene, and xylenes

VOC = Volatile organic compounds

The RPs intend to retain a highly qualified remediation construction contractor (other than ERM, as they are not construction contractors) that has performed PRB installations at numerous sites.

- 54) *We request that the Permeable Reactive Barrier be constructed in a way that allows the iron mixture to be replenished if needed.*

Response: The PRB will be constructed such that it can be augmented in the future if necessary.

- 55) *Guidelines state that air sampling should be conservative. We believe that 12-hour indoor air sampling yields more conservative results than 24-hour sampling. A longer sampling period increases the likelihood of diluting the results due to doors and windows being opened. Some assumptions about indoor air testing are based on different conditions on the East Coast compared to California. Vapor intrusion on the East Coast may be worst in the winter months. In that season 24-hour sampling might be reasonable due to significantly colder temperatures that discourage leaving doors and windows open. Indoor air sampling programs should consider and be developed with local atmospheric conditions in mind. Land use should also be considered. Residential indoor air monitoring should have a conservative approach. The risk factors of TCE are currently being re evaluated; there are differences of opinion. A conservative approach should be taken if only for this reason. Findings indicate that winter is not the worst period for vapor intrusion in California. We would want the houses to be kept closed as much as possible during the sampling in order to capture maximum risk and that can be managed better during a 12-hour period.*

Response: This comment appears to be associated with the annual indoor air sampling program that was initiated in August 2006, which is not associated with the FS. These issues were addressed by the Water Board in a letter entitled, “*Requirement for Offsite Indoor Air Sampling – 228 Hookston Road, Pleasant Hill, Contra Costa County*,” dated 28 July 2006. The intent of the sampling is to determine average daily concentrations of the monitored compounds descriptive of long-term exposure to vapors migrating from the sub-surface to indoor air, rather than to evaluate a worst-case scenario. Samples collected over a 24-hour period will more accurately account for occupant use patterns over the course of the day. Consistent with *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air* (DTSC, February 2005), we conclude that indoor air samples collected over a 24-hour period will more accurately describe the representative indoor air concentrations over a long-term chronic exposure.

Comments from Colleen Goya dated 6 August 2006:

- 56) *The alternatives involve selection of different technologies or combinations of technologies aimed at remedying the contaminated zones A and B. These alternatives are evaluated based on the 9 criteria established as standards for such situations. The*

evaluations and the criteria, however, seem to be missing a discussion of how adaptable the various alternatives are as remedial solutions.

How flexible and adaptable is each alternative, especially the recommended alternative #4? Is it adaptable to potential changes in the plume size and location? The FS seems to assume a static size and location that is not affected over time. What if monitoring results show poor progress in expected levels of remediation? Is there a fallback plan and are there contingencies for changing remediation methods or technologies if needed?

Response: See response to Comment 50, regarding adaptability.

57) *I am concerned about other source of plume contamination coming from mixed sources mentioned in the FS. Will Alternative #4 be complicated by those additional contamination sources-does this remedy preclude any other approaches to address the other contaminants?*

Response: We foresee no conflict between the cleanup technologies proposed by the Hookston Station RPs and the contaminants originating from non-Hookston sources. The types of remedial systems proposed to address the Hookston Station parcel will be effective on the VOCs emanating from other sources (other than Hookston Station). While the Hookston Station remedial measures are not intended to address the VOCs from other sources, to the extent that such VOCs from other sources have commingled with VOCs which may have originated from Hookston Station, they will be addressed by the Hookston Station remedial measures. The methyl-tertiary butyl ether (MTBE) plume emanating from the Pitcock Petroleum facility at 220 Hookston Road will not be treated by the PRB. The downgradient extent of the MTBE plume is currently being investigated by Pitcock Petroleum, and Pitcock will also need to develop a remedial strategy to address the plume.

- 58) *I would like to see the FS directly address the adaptability of the remedial alternatives, perhaps as part of the criteria of "implementability."*

Response: In accordance with the National Oil and Hazardous Substance Pollution Contingency Plan (NCP), the "Implementability" criteria in an FS takes into account "the ease of undertaking additional remedial action," to the extent they are required. This includes an assessment of the adaptability of the alternative. The Hookston Station FS was developed consistent with the NCP. See also the response to Comment 50 above.

- 59) *The proposed timeframe for the next phases through the start of actual remediation work feels discouragingly long. Is there any way to speed this process up?*

Response: The schedule for implementation of the remaining remediation components is as fast as reasonably can be expected in order to complete the remediation in a manner that is safe, effective, and in accordance with legal requirements. Water Board staff will work closely with the Hookston Station RPs to facilitate timely document review. The installation of vapor intrusion prevention systems and private well abandonments initiated several years ago by the Hookston Station RPs several years ago serve to eliminate exposures to TCE at concentrations above conservative theoretical risk-based screening levels. See also responses to Comments 33-35, above.

Comments from Amy Brownell dated 31 August 2006:

- 60) *The timeframe that is projected for reduction of the portion of the plume downgradient from the PRB seems like an aggressive schedule. Unfortunately, the homeowners who have been impacted by this plume have been potentially (depending on the configuration of their home, crawl space etc) exposed to unacceptable levels of vapors for a long time. So any possibility to speed up the cleanup under the impacted homes should be considered. To this end, an active treatment, such as injection of the ZVI slurry at appropriately spaced intervals starting from the outer edges of the downgradient plume and going inward would be well worth the expense. I would suggest a pilot test to see whether it is feasible and workable to inject the solutions into the A Zone underneath the neighborhood.*

Response: All residents living in homes containing concentrations of TCE above conservative theoretical risk-based screening levels have been offered free installation of vapor intrusion prevention systems. These systems, which are an integral component of the recommended alternative (Alternative 4), will address any near-term indoor air exposures. Direct injections of bioremediation amendments or chemical oxidants in the A-Zone were evaluated within the FS, which concluded that such injections would not be feasible because of the discontinuous nature of the shallow sand stringers in which A-Zone ground water is found. In addition, the locations in which such downgradient injections could occur would be limited to public rights-of-way downgradient of the highest concentration area due to access constraints, and therefore could not be applied uniformly throughout the impacted area.

- 61) *Please make sure all costs associated with Institutional Controls and particularly the cost of a county ordinance or county requirements for tracking the Soil Management Plan for the arsenic soils are included in the cost estimates. The RPs should be paying*

all the costs of the Institutional Control; they shouldn't be passed on to any governmental agency. If there will be costs associated with the Institutional Controls that will have to be passed on to future property owners/developers then the RPs should develop, write and assist governmental agencies in implementing permitting or other schemes that will set up programs to reimburse the county or cities or whatever governmental agencies will have to implement the systems that track the Institutional Controls.

Response: See response to Comment 23.

- 62)** *Please make sure there are sufficient monitoring wells around the PRB to verify that you are getting appropriate capture and treatment of the core of the plume.*

Response: A preliminary monitoring program was proposed in the FS. The RPs will propose a more detailed performance monitoring program as part of the Remedial Design. The Water Board will ensure that the monitoring program is appropriate for demonstrating remedial effectiveness. The site cleanup requirements order will specify monitoring and reporting requirements.

- 63)** *Make sure the monitoring schedule to prove the effectiveness of the treatment is very aggressive at the beginning of the cleanup implementation, especially if you do not add any extra treatment downgradient of the PRB. Once the treatment is proven effective, then monitoring could be reduced.*

Response: The RPs will propose a detailed performance monitoring program as part of the Remedial Design. The Water Board will ensure that the monitoring program is appropriate for demonstrating remedial effectiveness. The site cleanup requirements order will specify monitoring and reporting requirements.

Comments from Richard Nicoll, Assistant Superintendent, Mount Diablo Unified School District, dated 30 August 2006:

- 64)** *Will there be a contingency plan in the event that groundwater goes around the PRB instead of through it? If groundwater goes around the PRB to the west, then contaminated groundwater will be more directly up gradient of the MDUSD school property.*

Response: The PRB will be more permeable than the surrounding soil, and therefore ground water flow will be directed toward the PRB, and will not be re-directed around the PRB. Hydraulic monitoring will be proposed in the Remedial Design to ensure that the PRB is intercepting the ground water plume it is designed to treat. The Water Board will ensure that the monitoring program is appropriate for demonstrating remedial effectiveness. The site cleanup requirements order will include contingent tasks that would allow the Executive Officer to require preparation of a contingency plan in the event that the Executive Officer concludes that the existing cleanup plan is not working properly.

- 65)** *The planned location for PRB is in the vicinity of the highest detected concentrations of chlorinated compounds in soil vapor. Will air be monitored during the installation*

of the PRB? Will there be a plan to stop or adjust the scope of work if air quality is adversely impacted during installation of the PRB? Can this work be scheduled to occur when school is not in session?

Response: The Health and Safety Plan, which will be presented in the Remedial Design, will include a plan for air quality monitoring during any remediation construction work and a plan for adjusting work processes if elevated concentrations of vapors are encountered. For perspective, the highest concentrations observed in soil vapor are approximately 50,000 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), which is equivalent to approximately 10 parts per million by volume (ppmv). The Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit (PEL) for short term construction exposure to TCE is ten times this concentration (100 ppmv), which also coincides with TCE's approximate odor threshold. Given the dilution of vapors that occur during trenching operations, it is unlikely that any person would be exposed to unacceptable levels of TCE during any construction efforts.

66) *Will air be monitored in the area surrounding the residences when SVE is used to prevent contaminated vapors from entering houses? And/or, will the vapors be treated before they are discharged to the atmosphere?*

Response: Soil vapor extraction is not a selected remedial action for Hookston Station. However, low flow vapor extraction is performed under the barrier component of the vapor intrusion prevention system. The concentration of VOCs discharged to the outdoor air is very low, and dilution renders the concentrations negligible. Ambient air sampling in the Colony Park neighborhood is currently being conducted as part of the annual indoor air sampling program and quarterly soil vapor monitoring events, and was also conducted during the 2004 and 2005 indoor air sampling events. Since the installation of the first vapor intrusion prevention system in May 2004, 26 ambient air samples have been analyzed. TCE was not detected in any of those ambient air samples. Therefore, elevated concentrations of TCE are not expected in ambient air as a result of the vapor intrusion prevention systems.

Comments from Janet L. Wolff, on behalf of self and as trustee of the Welch Family Trust Residence: 1260 Trafalgar Court, Concord, California 94518, dated 31 August 2006:

**67) *The Cleanup Plan presented by the Calif. Regional Water Quality Control Board is not agreed to as the final resolution or even short term clean-up remedy to return the property to a condition that provides acceptable health, safety, usability and property value for the following reasons:
The remedial action proposed in the Feasibility Study only addresses the Hookston Station site and does not address the effects, impacts or other conditions that may be occurring from adjacent identified plumes; e.g., from the Cull [sic] property site, or Pitcock Petroleum site. There is not assurance that this treatment may, if done in an isolated manner as proposed, exacerbate the effects of the other plumes. This assurance must be made as well, and assurance that action to resolve these other sites must also be taken.***

Response: While the Hookston Station remedial measures are not intended to address VOCs from such other sources, to the extent such VOCs from other sources have commingled with VOCs which may have originated from Hookston Station, they will be addressed by the

Hookston Station remedial measures. Under state law, the Water Board cannot require the Hookston Station RPs to clean up contamination originating at other properties. We will require other parties to clean up non-Hookston contamination once we identify those parties with sufficient certainty.

The remedial systems proposed for the Hookston Station Parcel will neither exacerbate nor treat the methyl-tertiary butyl ether (MTBE) plume emanating from the Pitcock Petroleum facility at 220 Hookston Road. The downgradient extent of the MTBE plume is currently being investigated by Pitcock Petroleum, and Pitcock will also need to develop a remedial strategy to address the plume.

- 68) *The proposal to install a permeable reactive barrier with treatments that would only treat the TCE plume that presently resides under that barrier, and then relying only on the slow process of natural attenuation, does not address the down gradient (northeast) existence of the plume. More aggressive and direct treatment of this area, rather than reliance on a lengthy period of natural attenuation needs to be implemented.***

Response: See responses to Comments 51 and 52, above.

- 69) *The February 2006 C.T.E.H. Toxicology Report for the Baseline Risk Assessment, pages 39 and 40, states that there exists a cancer risk exposure for the Colony Park neighborhood and therefore 'needs further study'. The remedial action proposed by the Feasibility Study is not based on this 'further study' and therefore cannot be deemed acceptable as an acceptable specification for the proposed clean-up plan. Simply stated: the proposed Clean-up Plan is based on incomplete information.***

Response: There is no statement in the referenced report that calls for further study, evaluation, or sampling of the Hookston Station site or surrounding neighborhood. The Water Board believes that the characterization work was sufficient to prepare both the *Baseline Risk Assessment* and the *Feasibility Study*.

- 70) *The proposed Clean-up Plan provides for the injection of chemical oxidants into the ground and the health and safety effects of these chemicals, proximity to underground pipes, utilities, Kinder Morgan high-pressure pipeline. PG&E distribution center, etc., have not been addressed.***

Response: See response to Comment 6.

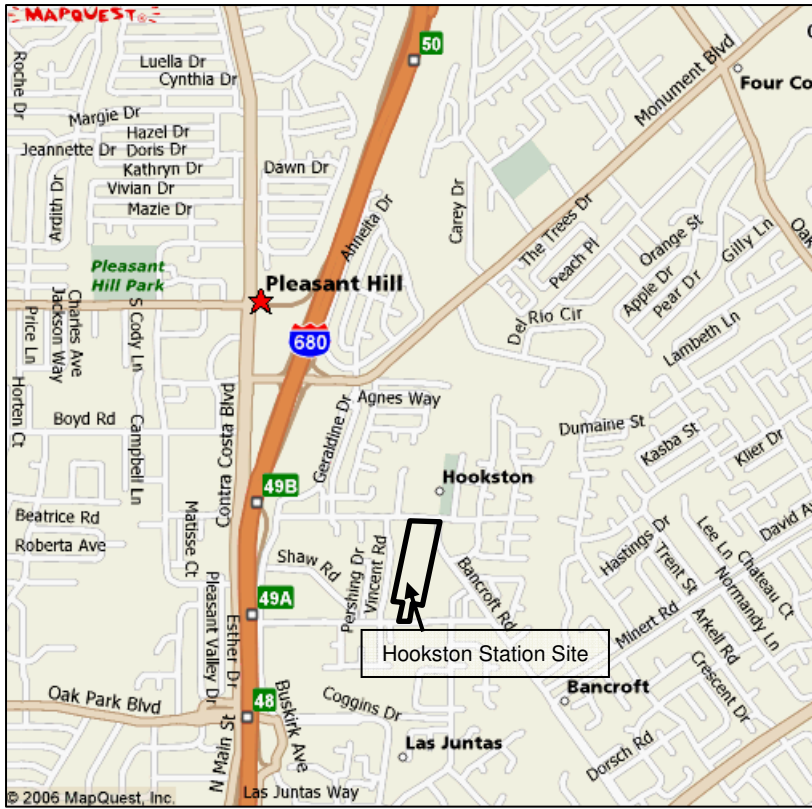
- 71) *Finally it has not been sufficiently explained as to why the clean-up site for the Hookston Station site needs to be in Len Hester Park. rather than the site of the source of the toxic contamination?***

Response: The final alignment of the PRB will be determined in the Remedial Design. The location in Len Hester Park was initially selected based on the low density of underground utilities beneath the park, compared with the high density of underground utilities located at the Hookston/Bancroft Road intersection and along this former railroad right-of-way. The park is also closer to the affected residential neighborhood, and therefore the benefits gained from the PRB cleanup will be realized sooner than if the PRB were constructed closer to or on the Hookston Station parcel.

Acronyms

FS	Feasibility Study
PRB	Permeable Reactive Barrier
RP	Responsible Party
SCR	Site Cleanup Requirements
VOC	Volatile Organic Compound

Appendix D – Site Location Map



Hookston Station Location Overview

Hookston Station Site Location and Groundwater Plume

