



California Regional Water Quality Control Board

San Francisco Bay Region



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Arnold Schwarzenegger
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TO: Bruce H. Wolfe
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FROM: George Leyva
Engineering Geologist

DATE: January 7, 2004

SUBJECT: HOOKSTON STATION, 228 HOOKSTON ROAD, PLEASANT HILL,
CONTRA COSTA COUNTY – Status Report

This report has been prepared to update the Board on the status of the environmental investigation at the Hookston Station Site in Pleasant Hill, California. This Board issued Site Cleanup Requirements on April 16, 2003 (Order No. R2-2003-0035). This status report was requested by the Board during the October 15, 2003, public forum, in response to public concerns regarding the investigation and cleanup of the subject site, particularly with respect to the vapor intrusion pathway. This staff report is broken into two parts. Part I describes the vapor intrusion issue in general, since the Board has not previously addressed this issue. Part II focuses on Hookston Station - the status of the dischargers' compliance with the Site Cleanup Requirements, current vapor intrusion investigations at the site, and the search for backyard wells in the vicinity of the groundwater plume.

CONCUR: _____
Chuck Headlee
Section Leader

CONCUR: _____
Stephen Hill
Toxics Division Chief

INTRODUCTION

Hookston Station is an eight-acre parcel located at the intersection of Hookston and Bancroft Roads in Pleasant Hill, Contra Costa County (Figure 1). The site is currently occupied by commercial and light industrial businesses.

The site was formerly owned by the Southern Pacific Transportation Company and was used for a rail line and a freight loading station (Hookston Station). The property was transferred from Southern Pacific to Mr. Daniel Helix in 1983. The eastern portion of the site was subsequently purchased by the Contra Costa County Redevelopment Agency (CCCRA) in 1989. Union Pacific Railroad Company (UPRR) became responsible for Southern Pacific's environmental liabilities for the site following the merger with Southern Pacific in 1997.

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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 the pending litigation between the Hookston Plaza owners, CCCRA, Southern Pacific, and others. All parties have settled their litigation efforts and have agreed to share costs for the investigation and remediation of chemicals detected in soil and groundwater originating from sources at the Site (Hookston Station Contamination).

A former tenant of the site, ET Mag Wheels, a manufacturer of chrome and alloy wheels, is suspected to have discharged the solvent trichloroethylene (TCE) to the ground and/or the sanitary line of the site from 1977 until 1983. Groundwater contamination from this site has migrated, abated only by natural conditions, to the north-northeast. To date, the extent of contamination encompasses an additional area of approximately 35 to 50 acres down gradient of the site. Although PCE has been detected in groundwater, it appears to be from a source upgradient of Hookston Station is present in much lower concentrations than the TCE and is not a chemical of concern for this Order. Approximately 120 single family and multiple family residential homes are situated above the 5 ppb TCE in ground water footprint. TCE contamination in groundwater has been measured at 12,000 micrograms per liter (ug/L) at the initial discharge point, 4,300 ug/L under approximately 4 homes, and at about 1,000 ug/L under 23 homes (Figure 2).

The Board's 2003 Order imposes a systematic approach to investigation and remediation of the TCE release. Of primary concern is the potential for the residents to be exposed to the TCE. Exposure can occur at this site in two ways; 1) volatilization of TCE from groundwater to indoor air of the homes or businesses (the vapor intrusion pathway) and 2) ingestion or dermal contact of shallow contaminated groundwater from backyard wells. The Order requires a Risk Assessment be completed by February 5, 2004, that takes into account all potential exposure pathways, including the above two pathways. Subsequent to the Risk Assessment Report, the Order requires a proposal to abate the threats to human health, if any, as well as to the threats to waters of the State.

PART I: APPROACH TO VAPOR INTRUSION PATHWAY

Background

The intrusion of volatile chemicals into buildings from underlying, contaminated soil and groundwater first gained attention as a potential health concern in the US during the early 1990s. The Board has been looking at this issue since the 1990's. Since that time, no cases of widespread impacts have been identified in the Bay Area. Cases of low level but widespread impacts have, however, been recently identified in Colorado, New York and other areas. This

has led us to provide increased scrutiny of sites we oversee and to prepare technical documents to specifically address this concern. While the Water Board focuses mainly on water quality and beneficial uses of water, we must also consider other human health threats, such as the vapor intrusion pathway, when we oversee sites with soil and groundwater contamination. The Board's authority to do so is contained in both the Water Code and the Health and Safety Code.

We now require an assessment of potential vapor intrusions concerns and impacts to indoor air quality at all sites where soil and/or groundwater are contaminated with volatile chemicals. Intrusion of vapors into buildings can occur through cracks or seams in the building foundation or through gaps where water, sewer and other utilities that penetrate the floor (Figure 3). The intrusion of vapors into a building can be enhanced if the building has a basement or if the air pressure inside the building is lower than the outside air pressure, creating a "vacuum effect" that can increase the upward flow of vapors through the foundation.

If adverse impacts to indoor air are identified in existing buildings or predicted for future buildings, dischargers are required to remediate the contamination and mitigate indoor-air impacts until such time that the risk to human health falls to acceptable level. Board staff work closely with other Cal/EPA agencies, particularly the Department of Toxic Substances Control (DTSC), to ensure that the most current approach to assess the vapor intrusions exposure pathway are used and to ensure consistency between agencies.

The USEPA is currently involved in vapor intrusion studies. USEPA's approach to the vapor intrusion issue is very similar to Cal/EPA's approach in most respects. The main difference involves USEPA's use of a more stringent toxicity factor for TCE, which can in some circumstances lead to more cleanup. This is only a potential issue at sites that are subject to federal cleanup requirements (e.g. Superfund sites).

Initial Screening of Sites

Due to the long history of urban and industrial development in the Bay area, trace levels of manmade, volatile chemicals are common in the soil and groundwater of many areas (e.g., due to releases of petroleum fuels, industrial solvents, dry cleaning solvent, etc.). Below a certain concentration, exposure to these chemicals does not pose a significant risk to human health. At higher concentrations, however, a potential risk may exist and further evaluation is warranted.

The risk posed by the intrusion of vapors into an existing building is evaluated through the collection and analysis of soil, groundwater, soil gas and/or indoor air samples at the site. As discussed in the next section, we prefer a sequential collection and evaluation of site data. Reported concentrations of specific volatile chemicals in the samples are then compared to conservative "screening levels" developed by either the Regional Water Board staff or the discharger. The use of screening levels allows for a rapid, initial assessment of site-wide conditions and permits a focused evaluation of areas with heightened concerns. If reported concentrations of a chemical fall below the screening level, then significant threats to human health are generally assumed to not exist and no further action is needed to address this

particular concern. If concentrations of a chemical exceed the screening level then additional evaluation is generally recommended or required.

Screening levels for groundwater, soil gas and indoor air are provided in the Regional Water Quality Board's technical document *Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater* (July 2003). The screening levels are based on scientific models for vapor intrusion into buildings as well as a growing body of data from actual field investigations. The development of "site-specific" screening levels by the discharger is allowed but is often limited due to a lack of detailed data on site soil conditions and building construction and ventilation designs.

Investigation Methods

The primary goal of a vapor intrusion investigation is to determine if the emission of volatile chemicals from contaminated soil or groundwater underlying a building(s) is causing (or will cause) impacts to indoor air above levels of potential concern. Once subsurface contamination has been reported, the direct collection and analysis of indoor air samples may seem to be a logical next step to evaluate this concern. Identification of the source of volatile chemicals in indoor air is, however, complicated by the presence of the same chemicals in outdoor air (e.g., due to auto exhaust or nearby industries) as well as in many common household items (aerosol sprays, cosmetics, cigarettes, dry-cleaned clothing, cleaners, etc.). In addition, plumes of contaminated groundwater can extend over significant areas and comprehensive testing of every structure over the plume is not practical.

Because of these factors, we recommend the following sequential approach to the evaluation of vapor intrusion concerns:

1. Collect soil and/or groundwater samples and compare data to screening levels for vapor intrusion concerns. If the source area concentrations are high enough to be of concern.
2. For areas over the plume where groundwater screening levels for vapor intrusion concerns are approached or exceeded, collect shallow soil gas samples and compare data to screening levels for vapor intrusion concerns. Site specific screening levels may be developed if, for instance, the underlying soils are fine grained. Fine grained soils may inhibit the transmission of vapors.
3. At buildings where soil-gas screening levels for vapor intrusion concerns are approached or exceeded, collect indoor-air samples and compare data to indoor-air screening levels. If the site is being developed and no representative buildings exist, go directly to Step 4.
4. If indoor air screening levels are approached or exceeded, implement appropriate remedial and vapor mitigation measures to reduce concentrations to acceptable levels. These measures can include source removal, groundwater treatment, eliminate exposure pathways, as well as institutional controls.

The table below illustrates screening levels for vapor intrusion for TCE; these are taken from the Board's July 2003 environmental screening levels document. The screening levels depend on both the land use and the soil type. The first column of numbers would apply to the Hookston site, since the groundwater plume overlies residences and since we have no specific evidence of fine-grained soils beneath the residences.

Media	Residential ESL by soil type:		Commercial/Industrial ESL by soil type:	
	Coarse	Fine	Coarse	Fine
Indoor air (ug/m ³)	1.2	1.2	2.0	2.0
Soil gas (ug/m ³)	1,200	1,200	4,100	4,100
Groundwater (ug/l)	530	2,100	1,800	6,900

As discussed above, the initial collection of only indoor air samples at a site is strongly discouraged. At sites where only a small number of buildings are being evaluated, however, the concurrent collection of both soil gas and indoor air data may be advantageous in order to speed up the evaluation of vapor intrusion concerns and help field-check the screening levels employed at the site.

The proper collection of soil gas and indoor air samples can be time consuming and tedious. Board staff recommend that guidance jointly prepared by Department of Toxic Substances Control and the Los Angeles Regional Water Quality Control Board for the collection of soil gas samples be followed. For sampling of indoor air, Board staff recommend use of guidance prepared by the Massachusetts Department of Environmental Protection.

Remedial Methods

At sites where adverse impacts to indoor air are identified or predicted, we require that the discharger propose engineered measures to mitigating these impacts. The most common measures are similar to systems used to mitigate radon and methane entry into homes and buildings. These systems are relatively inexpensive to install and have a good track record. Implementation and long-term oversight of these types of "risk management" measures is generally done in cooperation with local planning and building agencies.

Active or passive venting of vapors from under new or existing foundations is the common short-term approach to mitigating indoor-air impacts due to the intrusion of vapors from sources underlying a building (Figure 4). This could, for example, involve the placement of perforated piping under the building foundation and connection of the piping to a wind turbine or electric blower that actively pulls vapors from under the foundation and vents the vapors to outdoor air. The volume of vapors vented is generally small and is quickly diluted to well below levels of potential concern upon mixing with outdoor air. For new construction, impermeable membranes can also be installed under a building to inhibit the upward flow of vapors through the

foundation. Ultimately, remediation of contaminated soil and/or groundwater is generally required at sites where significant, long-term vapor intrusion concerns are identified.

Bay Area Sites Investigated

We have required indoor air sampling at eight sites so far, including five federal Superfund sites that we oversee (TRW, National Semiconductor, Teledyne, Spectra-Physics, and Printex) and three RCRA sites that we oversee (Philips, Baron-Blakeslee, and IBM). (RCRA refers to the Resource Conservation and Recovery Act.) We have results back from three of these sites (TRW, Philips, and IBM) and so far we have not found unsafe levels of VOCs in indoor air.

USEPA is requiring several Superfund and RCRA sites it oversees in Mountain View to conduct indoor air sampling. USEPA detected concentrations of TCE in indoor air at one residential house in Mountain View that posed potential chronic health concerns if exposure continued over a long period (e.g., thirty years). A vapor venting system was subsequently installed under the house foundation and the concentration of TCE in indoor air was rapidly reduced to below levels of potential concern.

PART II: HOOKSTON STATION

Investigations regarding environmental impacts to soil and ground water at the site were conducted between 1989 and 1996 by various environmental consulting firms on behalf of Contra Costa County and Mr. Helix. These investigations discovered the presence of both petroleum-based products (such as gasoline) and chlorinated solvents (which are commonly used as degreasers) in the soil and ground water at the site.

Since 2000, UPRR and Mr. Helix have been working with the Board to investigate both the Hookston Station and off-site source areas. Off-site sources (not on Hookston Station) are located on commercial/ industrial properties on Vincent Road, Hookston Road, and Estand Way. The Board is requiring the off-site potentially responsible parties to further investigate these preliminary discoveries.

The dischargers collected soil vapor surface flux measurements at the Hookston Station site and within the Colony Park neighborhood in May 2002. The results of this sampling indicate that out-door ambient air concentrations of TCE are below the Board's ESLs for TCE. The discharger incorporated mathematical modeling using the out-door air sampling to predict the in-door ambient air concentrations. This Preliminary Risk Evaluation Report concluded that "no unacceptable risks to human health are associated with passive exposures to volatile constituents in ground water at the Hookston Station site." Board staff did not concur with this conclusion and requested that the discharger prepare a Risk Assessment Workplan to include a soil-gas sampling plan and subsequent indoor-air sampling if indicated by the results of the soil-gas sampling. The results of these sampling events are to be incorporated into the Final Risk Assessment report for the site.

Soil-Gas Sampling and Indoor Air Sampling at Hookston Station

Approximately 23 homes are situated above ground water contamination at or greater than the groundwater screening level for volatilization of TCE to indoor as indicated in the Regional Water Quality Control Board's technical document *Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater* (July 2003). On September 19, 2003, the Hookston Station homeowners collected soil-gas and indoor air samples from a location within the 1,000 ppb footprint of the groundwater plume. The results of that sampling have not been disclosed to Board staff or the dischargers. During November of 2003, the dischargers collected twelve soil gas samples in the area of the Hookston Station plume. Three samples had soil vapor concentrations of TCE above the shallow soil gas screening level of 1,200 ug/m³ (Figure 5.)

Most of the residences located in areas with high soil gas concentrations are single-family residences with crawl-spaces beneath the home allowing for air sampling under the home. However, several of the residences are multi-resident structures with slab-on-grade construction .

In the December 16, 2003, report of the soil-gas sampling results, the dischargers proposed air sampling in the crawl space of selected homes as a next step in the investigation. However, Board staff concluded that, because three soil gas samples had exceeded the screening level for TCE in soil vapor (1,200 ug/m³), indoor-air sampling of a representative number of homes with crawl spaces and slab-on-grade homes is necessary to adequately assess the human health threat risks at this site. At a meeting held with the dischargers on December 18, 2003, Board staff requested that the dischargers submit a proposal for sampling indoor air. The dischargers submitted a revised indoor-air sampling proposal on December 31, 2003. This proposal has been approved by staff.

Area Well Survey

The groundwater located at this site is currently not used for drinking water purposes. However, the Basin Plan designates the shallow groundwater in most portions of the Bay Area, including this area, as a potential source of drinking water. Task No. 4 of the Order requested that the dischargers perform an Area Well Survey, due on May 28, 2003. The well survey spanned an

area much larger than the known footprint of the groundwater contamination. The report was submitted on time but Board staff requested further investigations be conducted because of the lack of initial response from the residents. The initial well survey was sent to 776 individual property owners, via USPS in the month of February 2003. Of the 766 addressees, only 231 questionnaires were returned.

On June 27, 2003, (following discussions with Board staff), 40 additional survey mailers were sent via certified mail to selected property owners that had not responded to the previous mailing events and were located within the bounds of the known groundwater contamination area. Of these 40, only 23 responded. The discharger canvassed the non-responding properties on a "door-to-door" basis to ensure a thorough investigation.

The results of that survey indicated that 13 wells exist within the bounds of the known TCE groundwater contamination but eight of those wells were not in use. The other five wells were in use but only used for irrigation.

The dischargers are in the process of requesting permission to sample the private wells during the month of January 2004. Data from this effort will be incorporated into the Final Risk Assessment Report, Task 8, due on February 5, 2004.

The dischargers, with concurrence from the homeowner, will abandon the well at no charge to that party. Any private well found to be contaminated and not abandoned, will be referred to the Contra Costa County Environmental Health Department for proper disposition. The Department can encourage (or require) well closure and can notify owners/residents of the potential health threats of continuing to use water from a contaminated well.

Status of SCR Tasks

The dischargers are making good progress on tasks required by the site cleanup order. The due dates for some tasks have been extended to accommodate the extra time required for review and because of additional complexities in some tasks not initially apparent when the order was adopted. Table 1(attached) provides a summary of task status.

Board staff will hold a community meeting in March 2004 to discuss the Risk Assessment report, discuss other reports and activities, and answer any questions from the public.

Status of Non-Hookston Station Contaminant Sources Investigations

PCE Plume. We have determined that PCE in groundwater is from a source upgradient of Hookston Station. However, the concentration of PCE in groundwater (non-detect to 1,100 ug/l) has led it to be of a secondary concern in relation to the TCE contamination at this site. Staff intends to request that these upgradient potential responsible parties perform an investigation to determine the source and extent of contamination.

Petroleum Hydrocarbons. Petroleum hydrocarbons seen in groundwater at the site appear to be related to the Haber Petroleum Company just west of the Hookston Station site. Groundwater investigations at this site are being performed under Board oversight.

CONCLUSIONS

Hookston Station is one of several groundwater contamination sites in our region where we are concerned about potential vapor intrusion into buildings. The Board's 2003 Site Cleanup Order requires the dischargers to conduct a full site investigation, including the vapor intrusion pathway, followed by appropriate cleanup activities. The dischargers are complying with the Order. With respect to the vapor intrusion pathway, they have completed soil vapor sampling and submitted a revised workplan for indoor air sampling. We will require prompt interim remedial action if this sampling shows unhealthy levels of VOCs in indoor air as a result of the groundwater plume. We can provide future updates on this site and topic if the Board wishes.

Attachments – Table 1

Figures 1-5

