

Third Five-Year Review Report

**Synertek Building 1 Site
3050 Coronado Drive
Santa Clara, California**

**Prepared by
California Regional Water Quality Control Board
San Francisco Bay Region**

September 2007

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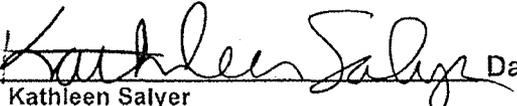
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List of Acronyms

BGS	Below Ground Surface
BPHE	Baseline Public Health Evaluation
GWET	Groundwater Extraction and Treatment
MSCA	Multi-State Cooperative Agreement
MCL	Maximum Contaminant Level
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
OU	Operating Unit
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
RWQCB	Regional Water Quality Control Board
SCR	Site Cleanup Requirements
VOC	Volatile Organic Compound

Executive Summary

The remedy for the Synertek Building 1 Superfund Site (Synertek #1 Site, or Site) in Santa Clara, California includes groundwater extraction and treatment (GWET), groundwater monitoring, and institutional controls. The Site achieved construction completion with the signing of the Preliminary Closeout Report on March 25, 1992. The trigger for this, the third Five-Year Review, is the second Five-Year Review, which was completed in September 2002.

The assessment of this Five-Year Review found that the remedy continues to be protective, but that groundwater cleanup standards cannot be met using GWET. The GWET system has remained shut down since the last Five-Year Review. The groundwater contaminant plume has been regularly monitored, and remains generally stable. Groundwater contamination is present in the two shallowest water bearing zones at the site, which have been designated the A-zone (shallowest water bearing zone) and B-zone (next encountered water bearing zone). Contaminant concentrations have fluctuated somewhat, but in general remain stable or continue to slowly decline. However, the near-source area well, MW-7A, has seen an increase in VOC concentrations in the latest sampling.

The contaminants found in groundwater at the Site during the initial investigation included TCE, 1,1,1-TCA, 1,1-DCE, 1,1-DCA, 1,2-DCA, Vinyl Chloride, and Freon 113. Currently 1,1,1-TCA and Freon 113 are below cleanup standards in all wells. Currently, the highest level of VOCs measured is 238 ug/l in well MW-12A and consists primarily of TCE, 1,1-DCE, and 1,1-DCA. This well has had the highest total VOC concentration over the last five years.

The remedy at the Synertek #1 Site is protective of human health and the environment because exposure pathways that could result in unacceptable risk are being controlled.

The next Five-Year Review for the Synertek Building 1 Superfund Site will be conducted in 2012.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site Name (from WasteLAN): **Synertek #1**

EPA ID (from WasteLAN): **CAD0990832735**

Region: 9

State: CA

City/County: Santa Clara/Santa Clara

SITE STATUS

NPL status: Final

Remediation Status: Operating

Multiple OUs? No

Construction completion date: 3/25/1992

Has site been put into reuse? No

REVIEW STATUS

Lead agency: State

Author Name: David Barr

**Author title: Water Resource
Control Engineer**

**Author affiliation: CA Regional Water
Quality Control Board (Lead Agency)**

Review period: August 2001 – September 2006

Date(s) of site inspection: 05/04/07

Type of Review: Statutory Policy

Post SARA Pre SARA

Non-NPL Remedial Action Site

Regional Discretion

NPL Removal Only

NPL State/Tribe

Review number: 1 (first) 2 (second) 3 (third) Other (specify)

Triggering action:

Actual RA Onsite Construction at OU#__ Actual RA Start at OU#__

Construction Completion

Previous Five-Year Review Report

Other (specify)

Triggering action date (from WasteLAN): **09/2002**

Due Date (five years after triggering action date): **09/2007**

Five-Year Review Summary Form, continued

Issue #1

The GWET system has been effective in reducing contaminant concentrations in the groundwater to low levels. However, this system reached asymptotic levels and was no longer recovering significant quantities of contaminants. Therefore, active groundwater extraction ceased and a monitored natural attenuation program was initiated.

Recommendations and Follow-up Actions:

The Regional Water Quality Control Board's Site Cleanup Requirements Order 91-051 and EPA's 1991 ROD specify that the final remedial action plan for the Site is GWET. Because groundwater is no longer being extracted at the Site, EPA needs to amend the ROD to reflect the change in cleanup method.

Issue #2:

Groundwater sampling results show that vapor intrusion is not a risk at the Site. However, methodologies used to assess vapor risk using groundwater data should be verified with soil gas samples under residential scenarios.

Recommendations and Follow-up Actions:

If zoning for property changes to residential, a re-assessment of vapor intrusion should be conducted to verify that vapor intrusion is not a problem.

Issue #3:

The restrictive covenant prohibiting use of groundwater at the Site was recorded prior to passage of California Civil Code section 1471, which establishes the framework for environmental covenants in California.

Recommendations and Follow-up Actions:

A new restrictive covenant must be recorded to be consistent with current California law.

Protectiveness Statement:

The remedy at the Synertek #1 Site is protective of human health and the environment because exposure pathways that could result in unacceptable risk are being controlled.

**California Regional Water Quality Control Board
San Francisco Bay Region**

Five Year Review

**Synertek Building 1 Superfund Site
3050 Coronado Drive
Santa Clara, California**

I. Introduction

This report is the third Five-Year Review for the Synertek Building 1 Superfund Site. The California Regional Water Quality Control Board (RWQCB or Regional Board), San Francisco Bay Region, conducted this review pursuant to the Multi-Site Cooperative Agreement (MSCA) between the U.S. Environmental Protection Agency, Region IX (EPA) and the RWQCB. The purpose of a Five-Year Review is to ensure that a remedial action remains protective of human health and the environment and is functioning as designed. This Five-Year Review Report is prepared pursuant to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §121 and the National Contingency Plan (NCP). CERCLA §121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

EPA interpreted this requirement further in the NCP; 40 CFR §300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

This Five-Year Review is required because hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. Specifically, contaminants in groundwater are present at levels exceeding the drinking water maximum contaminant levels. The triggering action for this review is EPA's signature date of the second Five Year Review in 2002.

II. Site Chronology

Site developed from agricultural land to a business park.	1974
A 200-gallon solvent tank and three neutralization tanks are installed at Synertek.	1974 - 1982
Synertek submits completed Water Board Facility Questionnaire.	1982
Groundwater contamination discovered at the Synertek Site.	1982
The 200-gallon solvent tank and three neutralization tanks are determined to be a source of contamination on the Site and are removed.	1985
Groundwater extraction and treatment begins from three onsite extraction wells.	1987
Regional Board adopts NPDES Permit No. CA0029211 (Order No. 87-050) for the discharge of treated extracted groundwater at the Site.	1987
Initial Site Cleanup Requirements adopted.	1987
Synertek Site is added to the NPL.	1989
Two offsite groundwater extraction wells are added.	1989
Revised Site Cleanup Requirements adopted.	1989
Regional Board adopts Order No. 91-051, the final Site Cleanup Requirements specifying the final RAP for the Site.	1991
Record of Decision signed by EPA.	1991
Regional Board issues coverage under Order No. 94-087, General NPDES Permit No. CAG912003, general permit for the discharge or reuse of extracted, treated groundwater resulting from the cleanup of groundwater from volatile organic compounds. Groundwater extraction and treatment (GWET) from the expanded extraction system begins.	1994
First Five-Year Review completed.	1997
Regional Board issues coverage under Order No. 99-051, General NPDES Permit No. CAG912003, general permit for the discharge or reuse of extracted, treated groundwater resulting from the cleanup of groundwater from volatile organic compounds.	1999
Regional Board allows the GWET system to be shut down in response to a significant decline in contaminant removal rates. A trial of monitored natural attenuation is begun.	2001
Second Five-Year Review completed.	2002

III. Background

Physical Characteristics

The Synertek #1 Site is approximately 1.5 acres in size and is located at 3050 Coronado Drive in the City of Santa Clara, California. The Site consists of a low rise building and landscaping and parking areas. The City of Santa Clara has a population of 95,200, and is part of the San Francisco Bay Metropolitan Region which has a population of about six million. The Site is located in a light industrial and commercial area that is dominated by

the electronics industry. It is in the area known as Silicon Valley, home to numerous computer related companies. Most buildings in the area are low rise developments containing office space and research and development facilities. The nearest residential area is about 3600 feet south and is upgradient of the Site with respect to groundwater flow direction. Other residential areas are located 6000 feet north-northeast of the Site. None of these residential areas are within the area impacted by the groundwater pollutant plume originating at the Synertek #1 Site.

Hydrogeology

Groundwater flows to the northeast towards San Francisco Bay. The Site is located in the Santa Clara Valley, a structural basin filled with marine and alluvial sediments. The coarser deposits are probably the result of deposition in or near stream channels that drain the highlands that surround the basin. Finer grain deposits result from a variety of conditions with the eventual result of a complex heterogeneous sequence of interbedded sands, silts, and clays.

Municipal water supply wells tap an extensive deep regional confined aquifer that lies generally greater than 200 to 300 feet below ground surface (bgs). A thick, relatively impermeable aquitard separates this deep confined aquifer from a complex series of discontinuous aquifers and aquitards that can extend up to within a few feet of the ground surface. Three distinct water bearing zones have been investigated at this Site. They are 1) the first encountered water bearing zone, called the A-zone is found from 10 feet bgs to 20 feet bgs; 2) the next encountered water bearing zone is called the B-zone and is found from about 30 to 40 feet bgs. The two zones are separated by a two to ten foot thick aquitard composed of clay to silty sand. There could be some hydraulic connection between the two zones due to the discontinuous nature of the sediment types.

The third encountered water bearing zone is called the B1 zone and lies between 100 and 108 feet bgs. Contamination is confined to the A-zone and B-zone. The groundwater contaminant plume in the A-zone is approximately 1,400 feet long. The B-zone contaminant plume is about 250 feet long.

Land and Resource Use

The Site was constructed in 1974 and has been in use since 1978 for performing quality control of chemicals and electrical testing of semiconductors. The Site and surrounding area were mainly agricultural until the 1960s and 1970s at which time the area began a transformation to commercial/industrial use. There are no projected land use changes for the Site. The surrounding area is light industrial and commercial. There are no projected land use changes for the area around the Site.

History of Contamination

Groundwater contamination was first discovered in 1982 when groundwater samples were collected at the Synertek #1 Site as part of a leak detection program for underground tanks initiated by the Regional Board in the South Bay Area. Following detection of groundwater contamination at the Site, a remedial investigation was initiated which determined the source of contamination from onsite solvent and neutralization tanks. The contaminants found in groundwater at the Site during the initial investigation included TCE, 1,1,1-TCA, 1,1-DCE, 1,1-DCA, 1,2-DCA, and Freon 113. Currently 1,1,1-TCA and Freon 113 are below cleanup standards.

Initial Response

Following the discovery of groundwater contamination at the Site, the Regional Water Quality Control Board required Honeywell Inc. (corporate successor to Synertek) to perform a soil and groundwater investigation. Interim remedial actions began at the Site in 1985 with the excavation and removal of the solvent tank and the neutralization tanks. Three groundwater extraction wells were installed and brought online to remove contaminated groundwater in 1987. Two offsite extraction wells were added in 1989. In 1990, Honeywell submitted a Remedial Investigation/Feasibility Study Report. The report evaluated the results of the subsurface investigations, the effectiveness of the interim groundwater cleanup actions, and evaluated remedial alternatives.

Summary of Basis for Taking Action

The Site overlies the Santa Clara Valley groundwater basin. Groundwater from this basin provides up to 50% of the municipal drinking water for over 1.4 million residents of the Santa Clara Valley. The Synertek #1 Site was placed on the National Priorities List primarily because of the past chemical releases' potential threat to this valuable resource.

IV. Remedial Actions

Remedy Selection

The Remedial Investigation/Feasibility Study (RI/FS) was submitted as two separate reports: an RI dated September 28, 1990, and an FS dated November 30, 1990. The RI and FS were the basis for the final Remedial Action Plan as set forth in Regional Water Quality Control Board Order No. 91-051, the Final Site Cleanup Requirements (SCRs), adopted on March 20, 1991. The Final SCRs contain the approved remedy for cleanup at the Site. The alternative that was selected in the SCRs as the final cleanup plan consisted of: 1) a deed restriction prohibiting the use of shallow groundwater, 2) groundwater monitoring, 3) groundwater pumping from onsite and offsite extraction wells, 4) treatment of extracted groundwater with air stripping and discharge of the treated groundwater to the storm drain under an NPDES permit. The EPA signed the Record of Decision for the Site in 1991.

The SCRs set cleanup standards at California proposed or adopted Maximum Contaminant Levels (MCLs), or the Federal EPA MCLs. These cleanup levels are:

{PRIVATE }Chemical	Cleanup Standard (ug/l)
1,1-dichloroethane (1,1-DCA)	5
1,2-dichloroethane (1,2-DCA)	0.5
cis-1,2-dichloroethene (cis-1,2-DCE)	6
trans-1,2-dichloroethene (trans-1,2-DCE)	10
1,1-dichloroethene (1,1-DCE)	6
Freon 113	1,200
Freon 11	150
1,1,1-trichloroethane (1,1,1-TCA)	200
trichloroethene (TCE)	5

Remedy Implementation

The GWET system and groundwater monitoring program were already implemented at the time SCRs were adopted. In December 1991, the property owner, RREEF USA Fund-III, recorded a covenant that prevents the drilling of groundwater wells.

Groundwater was extracted and treated until January 2001 at which time the Regional Board approved the shut down of the GWET system with continued groundwater monitoring, pursuant to an approved monitored natural attenuation (MNA) study. Synertek met with the Water Board in 2000, and the parties agreed that the GWET system was no longer removing significant amounts of contaminant mass and that groundwater contaminant concentrations were approaching asymptotic levels, the point at which continued groundwater extraction will no longer significantly reduce contaminant concentrations. Since then, the Site has been under a monitored natural attenuation program.

During the period of its operation, the GWET system extracted and treated approximately 72 million gallons of groundwater . Between January 1991 and December 1999, the GWET system removed approximately 84 pounds of VOCs. Of the total mass removed, approximately 40 pounds were removed in 1991.

Systems Operation/O&M

The GWET system was shut down in 2001. The system has not been operated since then. Honeywell has implemented a semi-annual groundwater monitoring program, pursuant to which it determines groundwater elevations and flow direction, and samples monitoring

wells for VOCs and other MNA parameters. Honeywell submits its semi-annual reports to the Regional Water Quality Control Board.

The cost incurred during the period of January 2001 through December 2006 for all activities related to groundwater cleanup at the Site was \$668,259. The following table provides details of the costs.

**Remedial Action Costs
Synertek #1 Site
January 2001 – December 2006**

Cost Component	Cost January 2001 to December 2006
Monitoring/Reporting	\$356,138
NPDES Permit Renewal/Maintenance	\$34,128
Regulatory Oversight	\$31,943
Project Related - other	\$246,050
Total Costs	\$668,259

V. Progress Since Last Review

No issues were identified in the previous five-year review and the remedy was found to be protective of human health and the environment.

When the GWET system was shut down in 2001, it was recognized that it was no longer removing significant amounts of VOCs. It was also recognized by the Regional Board that there were limits to existing treatment technologies, and that achievement of drinking water standards may not be feasible in the short term through active remediation. Monitored natural attenuation was allowed at this Site to see what effect this would have on the pollutant plume. The pollutant plume has stayed stable and since shutdown of the treatment system, VOC levels have generally been stable or slowly decreasing. The highest level of total VOCs on the site is 238 ug/l in well MW-12A which is down gradient from the source area. Concentrations have fluctuated in this well over the review period; however it appears that the concentrations have remained relatively stable overall. In general, reduction in pollutant concentrations in the plume appears to be proceeding quite slowly. The potential risk to human health and the environment is very low at the site. The cleanup levels for the chemicals of concern are the drinking water maximum contaminant levels. These levels are based on an excess cancer risk of one in one million for an exposure scenario of contaminated groundwater being used for domestic supply for a period of 30 years.

VI. Five-Year Review Process

Administrative Components

The RWQCB is the Lead Agency for the Synertek #1 Site.

Community Involvement

A public notice will be placed in the *Santa Clara Weekly* after the third Five-Year Review Report is finalized. The notice will give the purpose of the Five-Year Review, a summary of recommendations from the second Five-Year Review, a summary of findings from the third Five-Year Review and information on how to access the third Five-Year Review Report. In addition, the public will be encouraged to contact the Water Board or EPA with any questions or concerns about the remedy being conducted at the Synertek #1 Site.

No interviews were conducted during this Five-Year Review other than routine questions of the consultant performing the cleanup regarding activities at the Site. Contamination at the Site is confined to groundwater.

Document Review

This Five-Year Review consisted of a review of relevant documents including:

Annual groundwater monitoring and progress reports (2000 – 2006)
Final Site Cleanup Requirements Order No. 91-051, March 20, 1991
EPA Record of Decision for the Synertek #1 Site

Data Review

The Regional Board reviewed groundwater monitoring data collected from 2000 to 2006 to evaluate the groundwater pollutant plume and how the plume has responded to the cessation of pumping since 2001. The GWET system that came online in 1987 and expanded with the addition of two offsite extraction wells in 1989 was successful in removing VOC mass and reducing concentrations of VOCs in groundwater by up to 93 and 99 percent in the A- and B-zone aquifers respectively. By the late 1990's however, the amount of VOC mass being removed had declined considerably, and VOC concentrations in groundwater seemed to be stabilizing. This phenomenon of an initial significant reduction in VOC concentrations followed by a leveling off of the reduction in VOC concentrations has been found to occur at many other sites in the area and around the country. In 2001 the Regional Board approved a request by the Potentially Responsible Party to leave the GWET system shut down and see whether the pollutant plume would remain stable and if monitored natural attenuation could be an effective method of remediation. The GWET system has remained shut down since then, and the

Site has been monitored to ensure the plume is not migrating and to determine the effectiveness of natural attenuation.

To evaluate the effectiveness of monitored natural attenuation at the Site, four indicators were evaluated, as recommended by “Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites” (Office of Solid Waste and Emergency Response Directive No. 9200.4-17P, April 21, 1999). The four indicators are:

- Demonstrate that natural attenuation is occurring according to expectations;
- Detect changes in environmental conditions that may reduce the efficacy of the natural attenuation processes;
- Identify any potentially toxic or mobile transformation products; and
- Verify that the plume is not expanding either downgradient, laterally, or vertically.

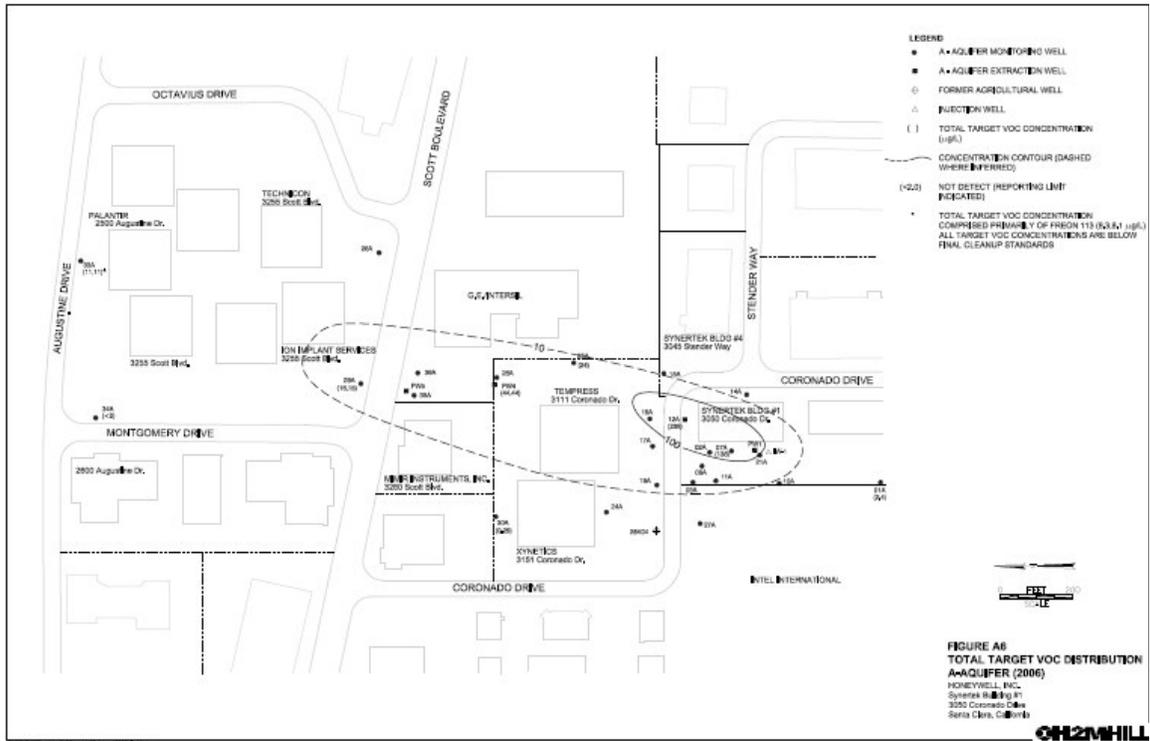
Evaluation of these indicators is discussed below:

Demonstrate that natural attenuation is occurring according to expectations:

The primary pollutants present in groundwater at the Site consist of the following VOCs: TCE, 1,1-TCA, 1,1-DCE, cis1,2-DCE, 1,1-DCA, Vinyl Chloride, and Freon 113. 1,1-TCA and Freon 113 are below their respective cleanup levels in all wells. 1,1-DCE exceeds the cleanup level in the A-zone, but is below the cleanup level in the B-zone. A review of the monitoring well data shows that, in general, the groundwater pollutant plume has remained stable since groundwater extraction ceased.

A-Zone: VOC concentrations in most of the monitored A-zone wells have remained generally stable since shutdown of the GWET system. The A-zone wells at the downgradient end of the plume have remained at less than the 5 ug/l cleanup standard for PCE, TCE, DCE, and DCA. Freon 113 levels have increased slightly, but are still less than 10 ug/l, well below the 1200 ug/l cleanup level. Well MW-7A is an A-zone monitoring well just down gradient of the source area. This well has seen an increase of VOCs that may be due to the migration of VOCs from the source area now that the source area extraction well is off. The well with highest concentration of total VOCs measured was well MW-12A which is downgradient of well MW-7A. Well MW-12A has had the highest level of VOCs over the last five years. Figure 1 shows the current Site plume map for the A-zone.

FIGURE 1 Synertek Building 1 Groundwater Plume Map for the A-zone
 (from: Monitored Natural Attenuation Investigation, 2006 Annual Report, CH2MHill, March 2007)



B-Zone: B-zone contamination has not migrated downgradient to the extent that A-zone contamination has. At the start of groundwater remediation, B-zone contamination was mainly in the source area centered in the area of wells MW-4B and PW-3, with much lower contaminant levels in downgradient well MW-12B and a couple of detections in further down gradient well MW-25B. Wells MW-4B and PW-3 had high concentrations of VOCs (up to 58,000 ug/l) when groundwater remediation started. Concentrations in these wells had declined nearly 99 percent when GWET ceased. Since shutdown of GWET, the B-zone source area wells have remained stable overall, but concentrations have fluctuated. There does not appear to be a pattern (seasonal, etc.) to the fluctuation in concentrations. Figure 2 shows the current Site plume map for the B-zone.

When the GWET system was shut off, Honeywell and the Regional Board expected that the plume concentrations would slowly decrease through the processes of natural attenuation. This has proven to be a slow process and VOC concentrations in most of the wells sampled have been generally stable.

Verify that the plume is not expanding either downgradient, laterally, or vertically:

The plume has not expanded in area since the last Five-Year Review. Contamination remains confined to the two first encountered water bearing zones and has not migrated vertically.

Site Inspection

A Site inspection was conducted on May 4, 2007, by Regional Board and EPA staff. No activities that could interfere with cleanup of the Site were observed. The institutional controls that are in place include prohibitions on the use of groundwater until cleanup levels are achieved. No activities were observed that would have violated the institutional controls. The Site consists of single story office buildings, parking lots, and landscaping.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

As discussed previously, the Regional Board approved shutdown of the GWET system in 2001, on the basis that the efficiency of VOC removal through groundwater extraction had declined considerably. Honeywell shut down the GWET system and instituted a groundwater monitoring program to determine if natural attenuation could successfully contain and remediate the remaining contaminated groundwater plume.

The plume has not expanded in size since the GWET system was shut off. A-zone monitoring wells at the downgradient boundary of the pollutant plume have remained at non-detect or below the cleanup level. Downgradient B-zone monitoring wells have remained at non-detect. The plume has not migrated vertically and contamination remains confined to the shallow-most groundwater bearing zones (A-zone and B-zone). VOC concentrations have overall been stable or slowly declining since the GWET system was shut down with the exception of MW7A, which has seen a recent increase. Institutional controls are in place that prevent any potential exposure to the remaining groundwater contamination.

The existing monitoring well network provides sufficient data to assess the progress of natural attenuation. The current groundwater monitoring program is sufficient to track the plume and detect any migration beyond the current plume boundaries, as well as monitor and track the effectiveness of natural attenuation in remediating the VOC plume.

There were no opportunities for system optimization observed during this review. Cyclic pumping has been tried at the nearby Intel Santa Clara 3 site and has not been effective in increasing the efficiency of VOC removal. Given the similarity in geology at the Intel and Synertek sites, it is unlikely that cyclic pumping would be effective at the Synertek Site. In-situ groundwater treatment through injection of compounds to enhance

biological activity and speed the breakdown of VOCs, or to directly breakdown VOCs would be more likely to cause further reductions in VOC concentrations. However there are no currently available remediation technologies that can consistently reduce VOC concentrations from the current levels to the cleanup levels.

The original risk assessment did not consider vapor intrusion as a potential exposure route. Using risk-based screening levels developed by the Water Board and recent data, it appears that there is not a risk associated with vapor intrusion for future residential use. However, current methodologies do not consider the possibility of preferential pathways that have existed at a small number of sites. Therefore, it may be prudent to conduct additional soil gas and indoor air monitoring, and potentially install engineering controls on any future buildings if the Site is redeveloped.

The institutional controls in place include a restrictive covenant that prohibits the drilling of groundwater wells until cleanup levels are achieved. No activities were observed that would have violated the institutional controls during the May 4, 2007 site inspection.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?

There have been no changes to the physical conditions of the Site that would affect the protectiveness of the remedy. The land use of the Site is commercial/industrial, and the use of the Site remains office space.

There have been no changes to Applicable, Relevant, and Appropriate Requirements for the Site and no new standards that would affect the protectiveness of the remedy.

The exposure assumptions used to develop the Human Health Risk Assessment were for potential future exposure if untreated groundwater were to be used for drinking water and if residential uses were to occur on the site. Vapor intrusion was not identified as a potential route of exposure. The Regional Board has developed risk-based screening levels for a variety of exposure routes including vapor intrusion into buildings from underlying groundwater contamination. The current levels of VOCs in groundwater at the site are below the screening levels for potential indoor air risk for both a commercial/industrial and residential use scenario. Recent experience at other vapor intrusion sites, has shown that the vapor intrusion assessment based on groundwater data should be verified with soil gas data if residential development is considered.

There has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy.

Changes in Toxicity Values

Since the 1991 health evaluation, there have been a number of changes to the toxicity values for certain contaminants of concern at the Site. Revisions to the toxicity values for 1,1-DCE and vinyl chloride indicate a lower risk from exposure to these chemicals than

previously considered. On the other hand, evaluation of the toxicity values for PCE and TCE is ongoing and may indicate higher risks from exposure than previously considered.

The greatest uncertainty with toxicological changes for the Site is associated with TCE. In August 2001, EPA's Office of Research and Development (ORD) released the draft "Trichloroethylene Health Risk Assessment: Synthesis and Characterization" ("TCE Health Risk Assessment") for external peer review. The draft TCE Health Risk Assessment takes into account recent scientific studies of the health risks posed by TCE. According to the draft TCE Health Risk Assessment, for those who have increased susceptibility and/or higher background exposures, TCE could pose a higher risk through inhalation than previously considered. The draft TCE Health Risk Assessment is available on-line at: <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=23249>.

The Science Advisory Board, a team of outside experts convened by EPA, reviewed the draft TCE Health Risk Assessment in 2002. The Science Advisory Board's review of the draft TCE Health Risk Assessment is available at: <http://www.epa.gov/sab/pdf/ehc03002.pdf>.

EPA's ORD and Office of Solid Waste and Emergency Response have requested additional external peer review of the draft TCE Health Risk Assessment by the National Academy of Sciences. Consequently, review of the toxicity value for TCE may continue for a number of years. This issue will need to be updated in subsequent five-year reviews.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has been identified that could effect the protectiveness of the remedy other than the potential for vapor intrusion. However, as discussed above, vapor intrusion will be evaluated after additional soil gas samples are collected and analyzed.

Technical Assessment Summary

There have been no changes in the physical condition or land use of the Site that would affect the protectiveness of the remedy. Some of the cleanup standards have been met; however TCE and several breakdown products of TCE still exceed groundwater cleanup standards. There have been no changes in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment, and there have been no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy, other than potential vapor intrusion, discussed above.

VIII. Issues and Recommendations

Issue #1

The GWET system has been very effective in reducing contaminant concentrations in the groundwater to low levels. However, this system reached asymptotic levels and was no longer recovering significant quantities of contaminants. Therefore, active groundwater extraction ceased and a monitored natural attenuation program was initiated.

Because of the complex and heterogeneous nature of the subsurface geology, the remaining low levels of contamination in the groundwater may not be able to be reduced to the cleanup goals with currently available remediation technologies.

Recommendations and Follow-up Actions:

The Regional Water Quality Control Board's Site Cleanup Requirements Order 91-051 and the 1991 ROD specify that the final remedial action plan for the Site is GWET. Because there is no longer active groundwater extraction, the ROD will need to be amended to reflect the change in cleanup method.

Issue #2:

Groundwater sampling results show that vapor intrusion is not a risk at the Site. However, methodologies used to assess vapor risk using groundwater data should be verified with soil gas samples under residential scenarios.

Recommendations and Follow-up Actions:

If zoning for property changes to residential, a re-assessment of vapor intrusion should be conducted to verify that vapor intrusion is not a problem.

Issue #3:

The restrictive covenant prohibiting use of groundwater at the Site was recorded prior to passage of California Civil Code section 1471, which establishes the framework for environmental covenants in California.

Recommendations and Follow-up Actions:

A new restrictive covenant must be recorded for the property in order to be consistent with current California law.

Issues, Recommendations, and Follow-Up Actions

Issue	Recommendations and Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
Because asymptotic levels had been reached at the Site, active groundwater extraction ceased.	A ROD amendment will be necessary to document this modification and any other changes that affect the selected remedy.	EPA	EPA	9/2011	N	N
Confirmation samples for vapor intrusion may be needed, if land use changes.	Re-assess potential vapor intrusion if zoning changes	Water Board	EPA	On-going	N	N
Covenant needs to be revised and recorded.	The covenants need to be recorded to be consistent with current California law.	EPA, and Water Board	EPA	12/2009	N	N

IX. Protectiveness Statement

The remedy at the Synertek #1 Site is protective of human health and the environment because exposure pathways that could result in unacceptable risk are being controlled.

X. Next Review

The next Five-Year Review for the Synertek #1 Superfund Site is required by September 2012.